

WORLD SYMPOSIUM ON THE IMPORTANCE
OF THE PATENT SYSTEM TO DEVELOPING COUNTRIES



COLOMBO 1977



THE IMPORTANCE OF THE PATENT SYSTEM
TO DEVELOPING COUNTRIES

COLLECTION OF LECTURES

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FOREWORD

The present volume contains the texts of 22 lectures prepared for the WIPO World Symposium on the Importance of the Patent System to Developing Countries. One of them* was not actually delivered, its author having been unable to attend personally. One lecture** is missing, since the text has not been received from its author. The present volume also contains the texts of the two opening and the two closing addresses.

The World Symposium was held in Colombo, Sri Lanka, in February 1977. Some 200 persons from 38 different countries participated.

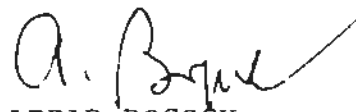
One of the important and rather unusual features of the Symposium consisted in the fact that most of the lecturers from the highly industrialized countries were officers of so-called multinational corporations, whereas most of the lecturers from the developing countries were government officers in charge of industrial planning and foreign investment. Thus the main dialogue took place, without intermediary, between, on the one hand, those who are ready and able to transfer patented technology and, on the other hand, those who decide whether such transfer is in the interest of the receiving (developing) country. (In most other meetings organized by intergovernmental organizations, the dialogue usually takes place between government officials on both sides.)

Such direct contact between the interested parties appeared most fruitful to the participants, and the general opinion, which developed during the meeting, was that other symposia composed in a similar way should be organized by WIPO in the future.

The World Intellectual Property Organization wishes to repeat its thanks to the lecturers. All of them are distinguished specialists in the subject matter treated at the World Symposium. Their lectures were listened to attentively by the participants and were generally followed by a lively debate.

Warm thanks are also due to the Government of Sri Lanka, which was in charge of most of the material organization, and discharged its task with efficiency and the habitual grace of the people of the beautiful country of Sri Lanka.

Geneva, July 1977



ARPAD BOGSCH

Director General

World Intellectual Property Organization

* That of Mr. Horváth.

** That of Mr. Khan.

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OPENING ADDRESS

Arpad Bogsch

Director General
World Intellectual Property Organization

Excellencies,
Ladies and Gentlemen,

The World Intellectual Property Organization is pleased to be able to organize in Colombo a world symposium on the importance of the patent system to developing countries. Sri Lanka is one of the most beautiful countries in the world, and I am sure that the participants will appreciate the fact that the meetings are being held in such a pleasant place. But politically, too, Sri Lanka is an important country. Only a few months ago world attention was focussed on Colombo when Mrs. Bandaranaike's Government hosted the Conference of the Non-Aligned Nations.

We are extremely grateful to the Sri Lanka Government for receiving the Symposium on its territory. The attractive and perfectly equipped Bandaranaike Memorial International Conference Hall is an ideal meeting place.

Once again, Sri Lanka will render a great service to the international community, and particularly the future of the developing countries.

OPENING ADDRESS

T.B. Ilangaratne

Minister of Trade
Sri Lanka

Mr. Director General,
Ladies and Gentlemen,

It gives me great pleasure to welcome to Sri Lanka the Director General of the World Intellectual Property Organization (WIPO) and both the Delegates of neighbouring Asian States who are representing their Governments at the Regional Conference on Industrial Property and the Distinguished Participants of the World Symposium on Patents organized by the World Intellectual Property Organization at the Bandaranaike Memorial International Conference Hall, Colombo.

I understand that this is not the first occasion on which an Asian Regional Conference on Industrial Property is being held by the International Secretariat of WIPO in Sri Lanka. In fact, the United International Bureaux for the Protection of Intellectual Property (BIRPI), the predecessor of WIPO, held its first Asian Regional Conference on Industrial Property in February 1966 in Sri Lanka. It gives me particular pleasure to observe that, after WIPO became a specialized agency of the United Nations in December 1974, the Director General of WIPO has honoured Sri Lanka in choosing the venue of this Regional Conference in Colombo once again.

I am also happy to note that the World Symposium on Patents which is to follow the Asian Regional Conference is the first of its kind organized by WIPO in Asia, the theme of which is the importance of the patent system to developing countries. This would clearly indicate the recognition of the fact that this International Secretariat is making a serious study to be responsive to the needs and aspirations of the developing countries. Towards this end, WIPO has also

arranged a Round Table Conference of Heads of Industrial Property Offices to study in depth the forms of technical assistance in industrial property in the developed countries which could be made available to trainees from developing countries.

I sincerely hope that there will be a full participation at these meetings. Whilst extending to the participants my best wishes, I trust that their stay in Sri Lanka will be both comfortable and pleasant.

FOREIGN INVESTMENT IN MALAYSIA

Hon. Tan Sri Datuk Haji Mohamed Salleh bin Abas

Solicitor General
Malaysia

1. It gives me great pleasure to be invited to participate in this Symposium. Not being an economist, I must first of all apologize before commencing my speech on a subject of which I have neither the knowledge nor the practice. However, I will attempt to speak on it from the viewpoint of a layman, not even from that of a lawyer. In this connection, it will be necessary for me to utter a word of caution in that whatever opinions are expressed in this speech, despite my position in the service of the Government of Malaysia, they are entirely my own and do not necessarily reflect my Government's views although in certain respects they may well coincide.

The Role of Foreign Investment

2. Like most developing countries which have attained independence, Malaysia lacks capital and technology. In order to build her economy she therefore has to rely heavily on foreign investments. At the outset of our independence in 1957 most of our mines and rubber estates from which our tin and rubber are produced were owned by foreigners whilst only a few of them were in the hands of local people. The economic and fiscal sovereignty with which independence has endowed her has not changed this situation, nor has it resulted in driving out or even curbing foreign investors. On the contrary, our Government not only does everything within its power to create a favourable climate for foreign investments but also goes so far as to maintain a policy of welcoming foreign investors to come to our lands. A number of seminars and symposiums on investment are held both at home and overseas. Numerous investment missions headed by Ministers or

high-powered officials are sent out to various capitals of the world with a view to disseminating information to those interested in investing in Malaysia. In addition, our Government opens and maintains offices for this purpose in important cities of the world.

3. In common with other third world countries which were once colonies of European Powers whose aim in colonizing was, *inter alia*, to secure a supply of raw materials for their factories at home, Malaysia's economy was initially based solely on primary commodities, *i.e.*, rubber and tin, which were marketed through London. Realizing the weakness of over-dependence on these commodities, whose prices have been subjected to severe fluctuations resulting in untold sufferings by those who depend upon them for their livelihood, the Government started after independence to broaden the base of the economy and embarked upon a policy of diversification of agriculture and a cautious introduction of industrialization into the economy. The agricultural sector consists no longer entirely of rubber but also of other products, such as palm oil, pepper and tobacco. Industrialization was at first introduced with the idea of manufacturing products which Malaysia had to import. This import substitution policy apparently was influenced by the need to save foreign exchange and to provide employment to the growing population. Later, as industrialization steadily increased and became established, the policy was changed in the 1970s from one of import substitution to one of export-oriented manufacture. This policy is being pursued vigorously under the present Third Malaysia Plan and it is expected that in the period between 1976 and 1980 export will account for 51.8 percent of the manufacturing sector whilst the growth of import substitution will fall from 28.8 percent under the previous Second Malaysia Plan to 12 percent of growth.

4. It is clear that these results could not have been achieved without participation by the private sector and in particular by foreign investments, which undeniably play a great part in the industrialization of Malaysian economy. Referring to the part to be played by foreign investments in the present Third Malaysia Plan, our Prime Minister recently said:

"The private sector, both domestic and foreign, will have a crucial role to play in the realization of the objectives of the Third Malaysia Plan. Private investors are being called upon to invest some \$26.8 billion in the next five years in all sectors of the

economy, particularly in manufacturing and construction. The Government is fully appreciative of the difficulties which have confronted the private sector in recent months. I give the categorical assurance that every effort will be made to ensure the maintenance of a favourable investment climate, which is so necessary for the private sector to make full use of the many opportunities for productive investment in the country. The Plan document reaffirms our policies in this regard. After launching the Plan, I shall also meet with representatives of the private sector to clarify any policy issues which they may wish to raise..."

Legal Framework

5. Foreign investment, like any other property, is protected in Malaysia by Article 13 of the Malaysian Constitution, which says that no person shall be deprived of property save in accordance with law and that no law shall provide for compulsory acquisition or use of property without adequate compensation. Internationally, the security of foreign investment is further strengthened by a number of investment guarantee agreements which the Malaysian Government has entered into with some foreign governments. It is a feature of those agreements that provisions are made to the effect that in the event of the host country nationalizing a foreign investment the affected investor will be compensated by his home government, which in turn, by subrogation into the investor's position, can claim compensation from the host government. So far none of those agreements has yet been invoked against Malaysia. To further facilitate foreign investment, Malaysia entered into bilateral agreements with some 13 countries on double taxation on earnings by foreign investors. They will thus not be required to pay tax twice over.

6. Apart from the Constitution and international agreements, the main legislations which provide the basis for various forms of incentives as part of the policy to attract foreign investments are the Investment Incentives Act 1968, the Free Trade Zones Act 1971 and the Customs Act 1967. By far the most important incentives are those provided for in the Investment Incentives Act 1968 and they are therefore of special interest. These incentives are: pioneer status incentive, locational incentive, labour utilization relief incentive and investment tax

credit. The aim of these reliefs is to provide partial or complete relief from income tax, which is at the rate of 40 percent of taxable income and a further 5 percent for development tax. The pioneer status incentive offers the investors relief from income tax for periods ranging from 2 to 8 years depending upon the level of the investors' capital investment and the investors' ability to make certain priority products, local content and locational criteria. Locational incentive is given to an investor for the purpose of encouraging him to set up industries in less developed areas. The relief period ranges from 5 to 10 years. Malaysia, like many other LDC countries [less developed countries], is faced with the problem of finding employment for its own people. Therefore, labour intensive industries are encouraged by the offer of labour utilization relief to investors wishing to set up these industries. The relief period is based on the number of full-time paid employees engaged by the investors. Another incentive given by the legislation is the investment tax credit given to investors for projects requiring heavy investment which need a longer period of gestation before profits are made. This relief is a deduction from the investors' taxable income of a sum at least equal to 25 percent of the amount spent on the fixed assets qualifying for the relief. There is also an Increase Capital Allowance, which allows an investor to depreciate assets at a greater rate of depreciation in the initial years of operation. In addition, there are a number of incentive schemes drawn up for the establishment of hotels and tourist resort complexes. There is also a range of export incentives to encourage export-manufactured products. Besides granting these fiscal incentives, Malaysia maintains an open economy with a liberal exchange control régime, which permits the free movement of capital and repatriation of profits. The only form of exchange control is the need to fill up a form if the amount to be remitted exceeds \$1,000. For the convenience of trade and industry, commercial banks have been given the power to approve any application up to \$1 million. Amounts in excess of \$1 million require the approval of Exchange Control, which is normally given.

7. The incentives available are accorded without discrimination both to foreign and to local investors.

Malaysian Attitude Towards Private Enterprise

8. Traditionally, when one speaks about foreign investment in the developing countries generally, the risk considerations revolve around lack of political stability and poor infrastructure. Of late, concern has been diverted to what is an apparently bigger hazard, namely, the threat of economic nationalism. This arises out of a misunderstanding that the example of the OPEC countries would be the trend for all developing countries to follow. It must immediately be noted here that, whatever interpretation one may want to give to actions by the OPEC countries, their case is a set of exceptional circumstances peculiar to themselves as an organization of countries which, together, hold the main source of a commodity the world cannot as yet do without.

9. If one asks what is the experience of investors in Malaysia, one will immediately be acquainted with the much-talked-about Petroleum Development Act 1974 and the Industrial Co-ordination Act 1975. To some people these Acts are obvious pointers towards an ultimate situation of economic nationalism. It is true that the Petroleum Development Act creates a national Oil Corporation with powers to control and regulate most aspects of the petroleum industry. But, within this new system of ownership and exploitation of the oil industry, the role of foreign investors and operators is obviously still significant: the object is merely to substitute a different basis for participation by foreign investors. The Industrial Co-ordination Act, as the name may suggest, is to provide for the desired co-ordination and orderly development of manufacturing activities. Before this Act came into force, such things were achieved by administrative measures. This misunderstanding has been satisfactorily resolved by a number of subsequent reiterations by Government leaders, reaffirming Malaysia's policy towards the private sector.

10. Malaysia is not changing her attitude towards private enterprise. The private sector share of the Gross National Product as compared with that of the public sector is 70 percent to 30 percent in its favour. The present Third Malaysia Plan, covering the years 1976 to 1980, has assigned a major and responsible role to private investment. It is targeted to grow by 10 percent in 1970 prices, representing an investment increase of 48.2 percent higher than the previous Second Malaysia Plan in the immediately preceding years 1971 to 1975. These figures are instructive for any assessment of the participation of private investment in the future.

11. Indeed those Acts are not a new trend. The past has reflected a similar attitude in that under the Second Malaysia Plan (1971-1975) government investment was unusually high. Such investment, however, was to a large extent prompted by the recent world recession, where private investment in Malaysia was generally low. More importantly, direct government participation was and may still be necessary to lay the infrastructure and to invest in areas which private investment had neglected. It is imperative that government participation should facilitate and accelerate the greater participation of the more economically depressed part of its population, namely, the Malays and the other indigenous peoples.

12. For a fair appraisal of any government control of free enterprise and hence also foreign investment, it is necessary to look at the economic profile of the country in order to appreciate its policy. The Malaysian economy, in terms of export earnings, depended for a long time on raw materials, namely, rubber and tin. Efforts to diversify and broaden the base have succeeded in developing the timber and oil palm industry. Today, their respective contributions are: rubber 30 percent, tin 18 percent, timber 16 percent and oil palm 8 percent. In the immediate post-independence years, after 1957, our development bias was towards improving production of our raw materials. In the 1960s we diverted into import substitution industries. Presently, our industrial development is oriented towards export manufacturing. In the Third Malaysia Plan, for the period 1975-1980, export-oriented manufacturing is to account for 51.8 percent of growth in the manufacturing sector and, with this change of emphasis, import substitution industries will decline from 28.8 percent under the Second Malaysia Plan to 12 percent in the manufacturing industry.

Special Problems

13. Malaysia has been fortunate in being able to sustain a steady growth of her Gross National Product. The average annual growth over 1970-1975 was 12.3 percent and, expressed in the pre-inflation period prices, i.e., in 1970 prices, the rate was 7.1 percent. This growth however has not simultaneously been able to achieve a perceptible distribution of wealth. In terms of corporate stock alone, a 1970 study shows over 60 percent of foreign ownership as against under 40 percent of local ownership. In 1975, it was 55 percent foreign, 37 percent Malaysian other than Malay and Malay interests, and the remaining

8 percent Malay and Malay interests. It is considered that this imbalance in stock ownership is not conducive to the political stability of the country; the situation will be corrected. Thus the Third Malaysia Plan target is 30 percent foreign, at least 30 percent Malays and other indigenous peoples, and the remaining 40 percent other Malaysians.

14. A further problem in our economic structure is that the division of group functions coincides with race. In 1975, agriculture, forestry and fishing activity was 67.3 percent Malay, 20.7 percent Chinese, 11.1 percent Indian and 13.8 percent others. In the manufacturing industry, for example, the Chinese constitute 60.2 percent of the industry.

15. The present inequitable distribution of wealth and the identification of industry or function by race are inhibitive of the promotion of national unity. To direct further growth away from this pattern, indeed to rectify the present situation, Malaysia has to adopt policies and implementation programmes to restructure its economy and hence legislation is needed in appropriate cases. Provided that private investment, both foreign and local, understands this policy and agrees to its implementation, Malaysia accepts and welcomes it. This is borne out by the important role which the Third Malaysia Plan assigns to private investment. A plan which relies upon greater participation by private enterprise, be it foreign or domestic, will not be successfully implemented if the Government's policy militates against it. It is for this reason, it seems, that our leaders, including our Prime Minister, reiterate on numerous occasions the attitude of the Malaysian Government towards private investors.

Observations on Malaysian Experience

16. That is, in a nutshell, a restatement of the Malaysian policy in its economic perspective, descriptive of the role of private investment and government effort and incentives offered to it in order to promote both without unduly sacrificing one for the other. But in its anxiety to attract investment, like many developing countries, the Government may have overlooked the real content of the incentives and the price at which they are given. The following are some specific observations on these incentives.

17. Exemptions from taxation in the host country without looking at the tax structure of the investor's country may not result in any real incentive for the investor. It may on the other hand only divert the tax incidence, whether in the host country or the investor's country. Some taxing jurisdictions have schemes of unilateral tax exemption or tax credit in respect of foreign earnings; if such a facility exists in the investor's country, the host country is merely subsidizing the investor's tax liability. A defence of this criticism has been that an investor would not apply for such an incentive if he were not likely to benefit himself. In the Malaysian example, where benefits and incentives are given as a package deal, it is unlikely that an investor would, in an application for this package deal, specifically exclude tax exemption from his application.

18. In the case of locational incentives, they are purportedly to encourage dispersal of industries. It is true that there may be valid reasons for this--for example, prevention of congestion and pollution, etc.--but is this not substituting a political process for what should be left to an economic planning process?

19. As we have seen, Malaysia grants these incentives on a non-discriminating basis. The rationale is of course towards a better response from foreign investment in general. But while one would not advocate any discrimination between one foreign national and another, some preferential treatment for local investors is quite acceptable today.

Efficacy

20. So much has been said for foreign investment, but what is the efficacy of foreign investment? The following observations are made with a view to identifying the problems faced by developing countries in their interaction with foreign investors.

21. It is common knowledge that one of the purposes of foreign investment is that production must be to benefit the people of a country--but the benefits must be for its people and not merely benefits to be taken away from its people. As such, the actual capital inflow and its earnings must bear a favourable comparison to private local investment and its earnings. The experience of some countries has shown that large earnings are made out of

small investments. This consideration aside, revenue departments are paralyzed when faced by the numerous devices employed by multinationals to evade tax. Transfer pricing policies in a multinational linkage of components or royalties and dubious trade accounts are some examples of such methods of evasion. While many taxing jurisdictions would have the power, in their laws, to reconstruct the prices of transactions between companies in a group, such power is rendered ineffective because of lack of evidence. The lever required lies mainly in enhanced collaboration among tax authorities in the various jurisdictions.

22. One of the most important reasons for foreign investment is the effective transfer of technology. In Malaysia, this has been felt largely in low technology areas. The Malaysian experience shows that, before an effective transfer can be achieved, two important conditions must be obtained. Firstly, there must be responsive population capable of absorbing this technology and, secondly, the infrastructure for research and development must be laid down. Malaysia is not sensitive about this; the question of the source of technology, whether imparted or self-generated, is determined rather on economic considerations.

Malaysian Patents

23. At this point some comments about the Malaysian patent system are pertinent as the patent system is often seen as an important factor in effective transfer of technology. Generally, a patent system whereby the products, methods or processes of a certain novelty or inventiveness are capable of creating exclusive rights for the inventor can be expected to stimulate technical progress. With reference to a developing country, however, it must be remembered that an industrialized programme cannot be sustained by the availability of patented knowledge alone; given the situation that in most such developing countries there is little or no technical know-how, the ancillary unpatented know-how is also crucial.

24. The Malaysian patent "system" has two main characteristics. Firstly, it is not a system for the grant of patents but the revalidation (confirmation of the letters patent) of patents registered in the United Kingdom. Secondly, there is in our law the right of our Government to use any such registered patent with no provision for compensation.

25. The relevant legislations are:

- (i) the Registration of United Kingdom Patents Ordinance 1951 (for Peninsular Malaysia),
- (ii) the Registration of United Kingdom Patents (Cap.124) for Sabah,
- (iii) the Patents Ordinance (Cap.61) for Sarawak, and
- (iv) the Patents (Government Rights) Act 1967.

26. The nature and extent of protection accorded by legislation is, as has been noted earlier, confined to patents which have been registered in the United Kingdom and subsequently revalidated in Malaysia. But the protection is available to nationals and non-nationals alike. So long as the patent is protected in the United Kingdom, the same rights and privileges are accorded. This is of course subject to the right of the Government to use such patents.

27. The inadequacies of this system of ours are obvious. Firstly, any registration is dependent on a United Kingdom acknowledgment first and, as such, even innovations by nationals have to be patented abroad. Secondly, since Malaysia is not as yet party to existing international treaties on patents, our practice of revalidation irrespective of the nationality of the patentee may not earn us any reciprocity of treatment for our nationals under patent laws in other countries. Thirdly, there is not a single registration for Malaysia but three separate registrations in the component States before protection can be given in the whole country. We have no national patent system, as such.

28. Do we therefore require a different system of patent protection?

29. In Peninsular Malaysia, of the 2000 patents revalidated, 99 percent are foreign and primarily of United Kingdom, German, United States and Japanese origin, with only the remaining 1 percent being local. This serves as a reliable indication of our dependency on foreign technology. Except for agricultural and agro-based industries--those too on very modest scales--the Malaysian priority, based on economic considerations, is with imported technology.

30. It is undeniable that a comprehensive patent system ensures security to patentees but, except for the need to overcome difficulties in connection with the registration of the patents of our nationals and their position in the international scene, the present system seems to be adequate as most of the technology we import is from countries which are members of WIPO. The United Kingdom itself being a member, all revalidation could be effected here with comparative ease. In effect, except for the inadequacies pointed out, for the purpose of protection of foreign technology our system meets the situation. The patent system apart, most licensing agreements would normally incorporate provisions on confidentiality of know-how.

The Need for a Code of Conduct

31. Foreign investment is undoubtedly needed but too much of it, especially when investors maintain what is called "an ugly look," may create political instability in the host country and have negative effects. The local population, fanned by nationalistic feelings, may be encouraged to protest against and also take steps which adversely affect foreign investors. During the last few years we have seen riots and boycotts organized against governments and investors and unless this situation is remedied the result will be disastrous both for the investors and for the host countries concerned.

32. The host country requires foreign investment in order to fulfil its economic objectives, whilst businessmen require the cooperation and assistance of the host country in order to make profits. This mutual interest between the host country and the investors can be maintained if a certain code of conduct involving each other's responsibilities can be formulated and observed by foreign investors as well as by the host country. The obvious one is that foreign investors must not interfere directly or indirectly in the political affairs of the host country as those are highly sensitive matters. They should not resort to corrupt or other dubious means in order to achieve their objectives, either alone or in competition among themselves, such as in obtaining contracts to supply equipments or setting up certain business ventures. Recent experiences have shown that such corrupt practices have caused acute embarrassment to certain governments, and even their downfall. It is ironical, however, that these practices were resorted to by the organizations of the

countries which believe so much in clean governments. To avoid feelings of antagonism towards them, foreign investors must not regard the host countries as markets to sell their products or a place where cheap labour can be obtained, or as an alternative site to manufacture their products in order to escape from the strict environmental laws of their own country. Above all, to be of lasting effect, foreign investments must be a means for economic development of the host country whilst at the same time not forgetting the profits which may be derived by the investors. Here, this requirement does not connote any charitable service to be rendered by the foreign investors, but it simply means that foreign investors must be ready and willing to reinvest their profits in the host country to train local citizens with a view to taking over functions and responsibilities from overseas experts, and to be more involved with local citizens and organizations and have more roots in the host country by forming joint ventures and partnerships with the locals and to transfer or, at least, share technology. On the side of the host country and the local population, they must realize that foreign investments have a positive part to play. The government of the host country, while inviting foreign investors to its land, must not so use foreign investments as to accentuate the poverty line already in existence whereby those who are already rich become richer and the poor remain so, or become even poorer. The ability of the host country to show growth in its GNP achieved through the agency of foreign investments may be very impressive but it is meaningless to the population at large if this GNP remains only a mathematical average whereas in reality the wealth is in the hands of a few millionaires. The result of pursuing such a policy of indifference as to the outcome or lack of satisfactory distribution of benefits derived from foreign investments can be unhealthy, as has been exemplified recently by riots in some countries where the poor took to the streets because of the increase in prices of basic commodities. To prevent this from happening, the benefits to be derived from foreign investments must be well distributed among the various sections of the public; otherwise neither a favourable political nor a favourable investment climate can be maintained and neither the host country nor the foreign investors themselves will enjoy a feeling of security.

33. If all these conditions are fulfilled, foreign investments do not need to be ugly and the local population does not need to hate them. After all, the common denominator between the local population and the foreign investors is the accommodation of their respective interests although their objectives may be different. A man requires the basic necessities of life. He does not inquire where the supply of these necessities will come from. It is so much the better if he can obtain them from his own resources but, if he cannot, he should be happy to welcome outside supplies provided that in doing so he does not lose his dignity or respect. It is therefore of no concern to him whether the resources to supply his basic necessities come from within or from outside his country so long as he maintains his freedom.

34. In the Malaysian context, whilst we need to increase the size of our economy, the increase in the GNP should not be our ultimate aim. The increasing wealth derived from the country's earnings should be better distributed, not only between the poor and the rich but also amongst several communities. It is therefore inevitable that government intervention is necessary in order to ensure the attainment of these objectives, but a word of caution is needed here because such intervention is always fraught with the inherent danger of corruption and nepotism. It is in this respect that the country may either progress or retrogress. There is no need to elaborate on the risk and damage caused by corruption, especially by people belonging to the top strata of society. It requires a very sincere government composed of sincere leaders to make the country safe from this danger. Economic planning, whilst involving billions of dollars of public funds, should be aimed not merely at producing so many millionaires but rather at the eradication of poverty. In these efforts there are always sharks and crocodiles lying in wait to snatch the nourishment meant for these unfortunate beneficiaries. Ultimately the only solution is that the law must be strong and the rules of law strictly observed. If this is not so, the fabric of society itself will collapse and foreign investments will be of no use.

CHARACTERISTICS OF A PATENT POLICY
AIMED AT INDUSTRIAL AND ECONOMIC DEVELOPMENT

Georg Albrechtskirchinger

Director
Federal Association of the Chemical Industry
Federal Republic of Germany

This Symposium will present a broad spectrum of experience in the field of investment policy and practices in developing countries, of collaboration between industry in the process of technology transfer, and, last but not least, the Symposium will deal more specifically with the general value of the patent system for developing countries.

It is my privilege to open the series of presentations that deal mainly with the patent system. The title "Characteristics of a Patent Policy Aimed at Industrial and Economic Development" is an indication of the non-sectoral and general approach to the question.

The object of the paper that I should like to present is --to put it in a single sentence--to demonstrate that the patent system has an intrinsic value for industrial and economic development and that it may very well be put to optimal use by framing and applying a deliberately balanced patent policy.

I realize that this initial statement leads immediately to a number of difficult questions.

What is the patent system and what could be considered to be its intrinsic value? Is it legitimate to speak of a patent policy?

These questions will have to be answered but let me first merely point out that for the purpose of this paper the term "patent system" is used as it is traditionally understood in

its countries of origin. Leaving subtleties of definition aside, it is understood to be a system for protecting inventions by granting a title which is freely negotiable and which entitles the owner to put the invention to commercial use himself inasmuch as he may exclude others from using it for a certain period. In this sense, the patent system is to be understood not at the international but at the national level, since the rights described will be based on national laws.

The term "patent policy" as used in this paper is meant to be part of an applied economic policy, similarly at the national level. Irrespective of the economic system, basic political decisions on the infrastructure of trade policy and industrial policy, on research, training, documentation and dissemination of technical information, on invention and innovation, and on competition and trade regulation, are determining factors in the formulation of a patent policy.

The Patent System

The apparent difficulty of debating the merits and deficiencies of the patent system in a global forum seems to have a number of reasons:

- a. Is there an international consensus, a common denominator, on the nature of the patent system?
- b. What is the impact of the patent system on the economy?
- c. The growth and development problems of less developed countries are so unique that an analogy with the historical experience of other countries is not necessarily convincing.
- d. The aim of developing countries to improve the transfer of technology comprises many more areas of concern than simply the patent, which is only one of the elements in the transfer of technology.

Common Denominator

The question whether there is a common denominator in the patent system may be answered briefly by pointing out that there is no universally accepted definition, but much common ground on certain basic elements of definition and a wide spectrum of opinion on the functions of the patent system.

It is significant that the text of the Paris Convention does not define the patent. It seems that at the time of the creation of the Convention, almost 100 years ago, there was no need for a definition because among the relatively small and homogeneous group of founding nations--all industrialized and all having a very similar economic policy--there was probably a tacit consensus. Today, the number of States members of the Paris Union or interested in such a treaty as an international basis for economic and technological cooperation has grown to include the majority of the world community, comprising countries at all levels of industrial development and belonging to different economic systems. Under such circumstances, a consensus on principles is a more complex issue and may necessitate the use of clearer definitions in the future. It is not the purpose of this paper to present such solutions but merely to indicate the wisdom of having clear concepts and definitions. One of the beneficial results of the current international debate on the role of the patent and the revision of the Paris Convention may be the international acceptance of clear definitions.

We do find common ground in certain elements of definition which are closely connected with a consensus on some of the functions inherent in a system of invention protection.

Patents deal with inventions in the technical field and must be such that they can be put to practical use. The inventor, by fulfilling the requirement of novelty, adds to the stock of knowledge known as "the state of art." In applying for the protection of an invention, the inventor must disclose the invention to the public, thus giving knowledge of all the essentials of the invention to the public and, in particular, to the man skilled in the art.

It is characteristic that up to the naming of the inventor and the disclosure of the invention by publication of the application there is common ground even between the patent and the inventor's certificate, the type to be found in most of the Socialist countries of Eastern Europe. This is one of the important conditions for international cooperation in technology. The disclosure of inventions by official publication is without doubt a stepping stone irrevocably available to all and divulging findings which are of practical use. Even if the disclosure of the invention does not and cannot contain all the information for its future practical application and its commercialization, i.e., the innovation itself, it allows rapid use to be made of the advance in research and in the state of the art, stimulating other brains to do better and avoiding costly and time-consuming duplication of work.

Once the stage has been reached that follows the naming of the inventor and the publication of the invention, the differences become more marked, not only between the inventor's certificate and the patent, but also between patents themselves. This is due to different economic systems and to the role of the individual and the concept of property in the economy; it is due as well to the different functions attributed to the patent in the economy.

Particular care must be given to the analysis of such different concepts and policies if we wish to ascertain the role of the patent system for industrial and economic development on a worldwide scale.

Let us try to do this by pointing out the differences between the patent system and the inventor's certificate system.

The basic Socialist concept of the economy is characterized by the notion that there is no private ownership of the means of production and consequently no private individual decisions on matters of production. On the contrary, such decision-making is done by means of central planning, which is not a private and individual process but a collective process of a public nature.

The basic concept of market economies is that the means of production are privately owned and that the individual has the autonomous right to engage in industrial production. In market economies, the government has no central and exclusive planning power; its role is usually restricted to providing guidelines and incentives for action in the economy. Even if the government itself engages in industrial production--a phenomenon that we quite often call the "public" sector to distinguish it from the private sector--it is done on the basis of property titles and in full competition with property titles which are not in public but in private hands.

One finds different forms and methods and varying degrees of intensity of government influence in market economies, and in this respect a brief comparison between France and Germany might provide a helpful explanation. The economy in the Federal Republic of Germany is based on a very liberal concept of the market economy. Nevertheless, there is an institution called "Concerted Action," which amounts to a regular round-table between the Government, industry and the unions. This institution's aim is to attempt to reach an agreement on the basic data of the national economy, such as growth, productivity, wage and price development, not in order to bind the

partners to the discussion but simply to reach a consensus on the desirability of certain developments.

In France, a characteristic feature of the market economy is the economic plan, a published document defining economic data for the future as economic goals. But this economic plan in France is not imposed on the country as a binding instrument since it is above all the result of lengthy prior discussion between the representatives of the Government, industry, commerce and the labor movement, and since it is also made operative not by binding regulations but through a system of incentives, a system of reward and punishment.

To summarize this brief comparison, it will be seen that we have different forms and different methods in market economies, but that we never have the exclusive public and governmental character of central planning.

It seems to me undeniable that an individual in a Socialist and centrally planned economy cannot make use of a patent unless the economic system allows him exclusive ownership and use of the invention in competition with others. The definition of the inventor's certificate does not incorporate the elements of exclusive use--i.e., of excluding others and of being freely negotiable--elements which are characteristic of the patent. The inventor's certificate as an instrument of another economic system fulfills functions which are typical of the system and can be fulfilled only within the system and, for this reason, the inventor's certificate is certainly not identical with the patent but very different from it.

It is not the purpose of this paper to analyze the differences in the protection of inventions which exist within the Socialist countries of Eastern Europe. Such differences exist and may be explained by more competent participants in this Symposium. It is evident that one of the important aspects of the inventor's certificate system is the concept of remuneration of the inventor for his contribution. This concept, however, is not necessarily alien to the patent system, which has also developed practical methods of remuneration for inventors.

In spite of the differences in the protection of inventions which exist within the Socialist countries of Eastern Europe, we can summarize the analysis of the nature and functioning of the inventor's certificate system by pointing out that such a system cannot be separated from the concept and practice of the centrally planned economy. Of course, this concept and practice may also evolve. We find nowadays in

the centrally planned economies of Eastern Europe new tendencies towards decentralizing decisions, giving more autonomy to those who organize and run production, and introducing a competitive notion into the economy. No one can predict at the moment whether the inventor's certificate system as found today will still be necessary and characteristic in those countries in the future.

Coming back to the non-Socialist countries, it must be noted that the basic difference lies not only in the property aspect of the invention and the absence of central planning in the economy but also in the fact that competition operates as a regulating instrument in the market. The variations which may be observed in the different industrialized countries of the non-Socialist world never deviate from this basic principle but simply reflect basic policy decisions taken by the various governments which condition the operation of the market factors. Some examples of such policy decisions in the patent field are: the grant of the patent with or without examination, the extent of opposition rights and of revocation during the grant procedure or after grant, the patent term in itself, provision for compulsory licensing. All these variations reflect a certain position taken to define the extent and the limits of a position of individual privilege in relation to the common interest.

May I close this introductory chapter on a common denominator of the patent system by drawing the following conclusions.

1. There are marked differences between the inventor's certificate system and the patent system. In fact, they coincide only in part.
2. There are variations within the two systems, which can normally be expected to continue and even to develop.
3. Since we live in a world with marked differences in economic structure and planning, it is of interest to note that disclosure and dissemination of technical information is fulfilled by both systems.
4. In view of the international need for technology transfer, the purely internal performance of the systems themselves is not in itself enough. The systems must also function as an instrument of international technology transfer, to provide a basis for decisions on collaboration, investment, production abroad and marketing abroad. In this respect, the patent system has proved its universality and practical value quite irrespective of economic systems and, apparently, even among partners in countries which internally practice the inventor's certificate system.

At any rate, in view of the fact that a large share of the technology on the international technology market flows from countries with a market economy, the maintenance and availability of the patent system seem to be in the interest of every country.

The Economic Impact of the Patent System

Literature is abundant on the topic of the effects of the patent system on the economy. Can we at all expect a clear answer to this question on the basis of economic theory? I am afraid not. One of the fundamental studies on this question was made by Professor Machlup in the early sixties at the request of the Subcommittee on Patents, Trademarks and Copyrights of the United States Senate Judiciary Committee. This study was published under the title of "An Economic Review of the Patent System" and deals systematically with the historical evolution of the patent system and its evaluation by economic theory. Machlup finally comes to the conclusion that there is no scientifically justifiable, clear answer as to the beneficial or detrimental effect of the patent system on the economy.

This is, of course, a disappointing result for both friends and enemies of the patent system. Still, it should be admitted that, in the year following the publication of Machlup's study, eminent authors, not great in number but highly respected, were unable to shed more light on this issue. It seems that this question will always remain a controversial one and that we should be extremely careful in the appraisal and use of studies based on economic theory. It turns out to be more a question of faith than of facts. At least, Machlup's conclusion is honest. Economic theories also have their life-span and seem to die a natural death. May I remind you that both economists and governments were spellbound for almost a generation by the analysis made by Keynes of the business cycle and of the proper method of government intervention in order to guarantee growth, stability and employment in the economy.

By now, governments have learned--maybe some of them somewhat late--that what was true yesterday is no longer suitable for solving today's problems and that they are about to search for new and necessarily less doctrinal methods of steering the business cycle.

I would add that economic theory as an explanation of the patent system is only one side of the picture. Empirical

economic studies are another solution. An empirical study, by definition, must be based on verifiable data, and not on assumptions, and must contain a description of the method of fact-finding employed.

In the absence of such a description, there is no way to check the validity of the interpretation made. There seems to be a real lack of empirical studies which would meet the above-mentioned standards. It is evident that such empirical studies will have to be devoted to specific situations and specific questions limited in scope. They will be less spectacular in their conclusions and they will make less enjoyable reading matter, but it seems that they are likely to provide a more precise insight into the problems of the patent system than the yardstick of purely abstract economic theory.

Some examples of such studies are recent publications in the Federal Republic of Germany. Without wanting to overestimate their importance for this particular debate, I should nevertheless like to mention that one of these studies represents for the first time, as far as the Federal Republic of Germany is concerned, an empirical study based on interviews and case studies in answer to two questions:¹

1. The effect of the patent system in the innovation process.
2. The patent and licensing policy practiced by companies.

The study comes to the general conclusion that the patent system is a strong incentive for the research and development activity of companies and that for this reason a policy of strong patent protection should be pursued in the Federal Republic of Germany. Special emphasis is given in this study to the beneficial effects of disclosure of technical information by the patent system. The study also states that the patent system encourages the utilization of inventions and ensuring

¹ Patentwesen und technischer Fortschritt, Part I: "Die Wirkung des Patentwesens im Innovationsprozess"; Part II: "Patent- und Lizenzpolitik der Unternehmen." Ifo-Institut für Wirtschaftsforschung, Kommission für wirtschaftlichen und sozialen Wandel. Verlag Otto Schwarz & Co., Göttingen, 1974. See Book Review by Hanns Ulrich, *International Review of Industrial Property and Copyright Law (IIC)*, Vol. 7/No. 2/1976, p. 297.

that most of them are really worked. Patents not worked and held merely to obstruct others seem to be minimal in number and importance. The study also states that the patent system is a strong incentive to licensing, which allows the patent owner to refinance some of his research by receiving royalties; in this respect it is pointed out that a proper balance between patent protection and competition law should be maintained in order to safeguard the beneficial effect of the patent system on the transfer of technology by licensing.

It seems that little empirical study work has been done so far on the specific situation of developing countries and the patent system. Recently, in my country, two publications have been presented that deal with this issue. One of them treats the effects of the system of patent protection on the pharmaceutical industry in Latin American countries, covering the years 1970 and 1971. This study comes to the conclusion that strong patent protection in a developing country has a positive influence on both the export and import capacities of the respective products.¹ Another recent empirical publication deals with the question of imports of patented products into developing countries as a means of transfer of technology.² The study comes to the conclusion that, in a developing country, even patents which are utilized by the foreign patent holder for imports of the products into the country have a positive economic effect inasmuch as it can be clearly established that a high rate of foreign patent holdings in a developing country is also accompanied by a high per capita productivity rate. I have pointed out before that such empirical studies are by nature sectoral and of limited scope. But, without wanting to overestimate the significance of such studies, it should be noted that this empirical approach to specific issues is more likely to shed light on the difficult

1 Auswirkungen unterschiedlicher Patentsysteme auf die wirtschaftliche Entwicklung von Entwicklungsländern-- Eine empirische Untersuchung am Beispiel der pharmazeutischen Industrie in Lateinamerika. M. Mundkowski, A. Sell. Institut für Wirtschaftspolitik, Kiel, 1976.

2 Die Rolle patentgeschützter Importe für den Technologietransfer in Entwicklungsländern. Siegfried Greif. GRUR International 1976, Volume 9/10.

questions of the relationship between the patent system and economic growth in development than purely abstract studies or papers which deplore a certain situation of fact and keep reiterating such descriptions without investigating the economic impact of the facts.

It is not surprising that for developing countries the question of the economic impact of the patent system seems to be even more difficult to answer and also more controversial since they are faced with unique problems. The development gap between the industrialized countries and the less developed countries has become the foremost problem of a geographically shrinking world, and the less developed countries are forced to undergo changes and adaptations to the technological age in a much more abrupt manner than today's industrialized countries had to do generations ago. The important role of technology transfer in the development and growth of the economies of less developed countries has been fully recognized in recent years; technology transfer and indigenous technological development are in the long run to be considered the most important growth factors in the economy of the less developed countries.

In this respect, the patent does play its role but it must also be said that, realistically, a considerable part of the transfer of technology is not necessarily directly connected with patented technology. The role of the patent in this process may be of importance but it is also limited. For this reason, the role of the patent in a developing country must be realistically appraised and must be an integrated part of the general policy for technology transfer and technological development.

The Value of the Patent System

In the course of the international debate during the last few years on the transfer of technology, the patent system has come under heavy attack. Serious doubts as to its aptitude for resolving the problems of developing countries have been raised. A number of developing countries have undertaken changes in their legislation with a clear tendency towards weakening patent protection. In addition to such legislative methods, systems of control of licensing contracts have been installed and often the tax burden on technology transfer processes has been increased.

This is not the moment to describe this evolution in detail; the broad concept is familiar to all of you. Of course, it would be of interest to have an objective appraisal

of the effects of such a policy of patent erosion and contract control. The institution of control of licensing contracts is probably too recent to allow any conclusion on whether this policy discourages transfer and investment. As far as the practical effects of the erosion of patent rights are concerned, one might expect to have some evidence since many of these measures were taken some time ago. Unfortunately there is a lack of publications of this sort. At any rate, there has not yet been any publication showing positive results of legislation restricting patent protection. It seems that those governments that have substantially eroded or even practically abolished patent protection in certain areas of technology are not in a position to prove that this policy has been beneficial either for the transfer of foreign technology to the country or for the evolution of indigenous innovation.

In spite of these serious inroads into patent protection in certain countries, it should be noted that the international community, including the less developed countries, is not advocating the abolition of the patent system but merely discussing possible reforms at both the international and the national levels.

If one considers the evolution in recent years in the industrialized countries, both of the market-economy and of the Socialist types, there certainly seems to be no tendency towards weakening the patent system at the national or the supra-regional level. On the contrary, it is evident that the Socialist countries of Eastern Europe, irrespective of the modalities of their internal system of protection of inventions, do consider the patent system to be of importance both for their own economic and technological development and for their participation in international transfer of technology operations.

The market-economy countries of Europe have concluded treaties on a regional basis which facilitate, for a large number of European countries, the procedure of application and examination of patent applications and which, for the countries of the Common Market, will lead to a new uniform title of strong patent protection. This recent development clearly shows that there is a unanimous opinion in European countries and a high degree of concerted legislative and political action towards strengthening the patent system.

It is of interest to observe that this tendency towards establishing a strong patent system--to take the example of the Common Market--occurs in a part of the world where competition is considered to be an important self-regulating

principle of market economies. Both at the national level and at that of the Common Market, there is legislation designed to prevent restrictive trade practices and to maintain competition. The patent system is in no way a contradiction of the typical functions attributed to competition in a market economy, which are mainly the following:

Orientation of production according to consumer preference.

Optimal allocation of production factors and resources.

Orientation of production capacity according to changes in demand and changes in production technique.

The system of a strong patent protection is considered to be compatible with a competitive economy. The explanation for this is that the patent system fulfills functions which could not be fulfilled with the same efficiency in the absence of patent protection. These functions are mainly the following:

Disclosure of technical knowledge as an automatic consequence of the patent application, disseminating rapidly the new technological knowledge and avoiding costly and useless duplication in research and development.

Readiness to invest in costly research and development.

Encouragement to invest in production units, that is to say, to take the invention to the stage of innovation and practical application.

There is probably agreement that these very functions, properly fulfilled, will also be of great value in less developed countries in guaranteeing the attainment of the development goals set by these countries. There is certainly no proof to the contrary, that the less developed countries would be able to benefit from such results in the absence of patent protection. Assuming that the patent system also has intrinsic values for less developed countries, both for their internal technological development and in their role as recipients of foreign technology from more developed countries, the question remains whether it is advisable and possible to develop a patent policy adapted to the specific needs of the country. A patent policy adapted to the specific needs of the country would have to be a sort of tailor-made policy optimally combining the beneficial results of the patent system and avoiding its deficiencies.

There is, of course, no ready-made blueprint available for such a tailor-made policy. One must realize that such a policy is a matter of political decision to be made at the national level of a developing country and by those authorities which have the political responsibility. In view of the enormous differences in the political and economic set-ups of the various developing countries and in view of the many preoccupations of their development policy, one can certainly not suggest any uniform pattern.

It seems, however, that in this connection two sets of questions must be raised. The first would be whether the present international system, mainly as laid down in the Paris Convention, is flexible enough to accommodate such a policy and whether the main preoccupations of the less developed countries, as the recipients of foreign technology, can be properly included in such a patent policy.

The second would be which supplementary patterns of cooperation between developing countries themselves and in their relations with developed countries are necessary to make such a policy a success.

Let me try in all modesty to attempt a brief answer to these two sets of questions and then conclude this paper by making some practical suggestions which might be of interest in considering how to arrive at a tailor-made patent policy in a developing country.

As to the first of those questions, it seems that the international system in no way prevents the member States of the Paris Union from devising distinctive forms of patent policy. As a matter of fact, there are a good many examples in the history of the Paris Convention of distinctive policies developed and employed by the original member nations in the course of their economic history. The Paris Convention contains only a very few binding principles, a minimum line of conduct to guarantee the international functioning of the protection of inventions.

The current debate on the revision of the Paris Convention has shown all participants the wide range of national autonomy in defining a patent policy existing already under the present text of the Convention. One example of this autonomy is the term of the patent that the national legislator provides; another example is the regulation of compulsory licensing, where the text of the Convention provides no initial time limit at all whenever a compulsory license is given on grounds of public interest.

It seems to me that the real problem for the developing countries is not the lack of flexibility of the international system but rather the difficulty of integrating a national patent policy into the economic policy as a whole. Patent policy is not an isolated feature of economic policy and therefore cannot be treated as an isolated phenomenon.

In recent years, the developing countries have very clearly articulated their main preoccupations in relation to the patent system. One of their preoccupations is the problem of working the patent. The developing countries insist that the patents held mainly by foreign patent owners should really be worked in order to facilitate industrial development. The remedy sought in the international debate on the subject of changes in the Paris Convention in this respect is centered on proposals to provide wider possibilities of compulsory licensing or even of revocation of patents in cases of non-working.

If the Paris Convention were to be revised accordingly, and assuming that the national legislator in developing countries took corresponding steps in the national legislation on patents, it would still be uncertain whether such measures would really improve the situation since a bundle of restrictive measures does not seem to be an encouragement to foreign applicants to apply for patent protection.

It seems to me that it would be more practical to make sure that the national patent legislation provides incentives for working rather than possible punishments for non-working. Incentives for working could be found, for example, in a system for adapting the term of the patent to the use which is made of it in the developing country. Even under the present Convention, the national legislator has the possibility of providing for a relatively short basic term for the patent. One could imagine a system under which a step-by-step prolongation of the patent would be provided for, where under given conditions the patent owner has made serious efforts to work the invention in the country.

Such a system would also give the authorities some margin of discretion in difficult cases. For example, it is quite obvious that, for certain types of production in certain parts of the world, production units in neighboring countries would be too costly and unproductive, and that a criterion of market supply for all the neighboring countries, under fair and equitable conditions, from one production site in one of these countries would be economically the best and most feasible solution. Under the patent system proposed, the criterion of

adequate market supply could be fully considered when examining the working of an invention, and such a system would also provide the necessary encouragement for the foreign patent owner to proceed with a step-by-step investment program, possibly leading from importation of the articles to partial production--and, finally, full production--in the country.

Another important preoccupation of developing countries is the problem of fostering indigenous development of inventions and innovation. Here it seems that the patent system as such is beneficial. It encourages creativity in the technical field and provides a fair starting point for an innovator even if his resources are limited. We have observed in industrialized countries that the patent system, by virtue of the exclusive right of use and production, often puts the smaller company and the younger company in a position to compete with competitors that are financially very strong.

It must also be acknowledged that one of the most important sources of innovation and creativity in the technical field in a developing country is the inflow of know-how. It is evident that the existence of a sound patent system is beneficial for the inflow of know-how and the optimum use of know-how, including the adaptation of technology to specific local needs and the training of personnel.

Turning to some rather specific points of patent policy in the administrative field, it seems that developing countries are faced with considerable problems in providing the necessary administrative structure in the patent field. In this respect, it should be recalled that even in industrialized countries the efficient running of large offices to examine patents is becoming more and more of a problem. The international European treaty recently concluded in Munich providing for central examination for a large number of European States has also been influenced by this administrative concern and by the search for simplified procedures. In the meantime, we also have in some industrialized countries a selected system of examination of patent applications, the so-called "deferred" examination, and all the patent offices and their customers are haunted by the problem of rising costs. Therefore, it seems that developing countries too should first turn their attention to simpler methods of protection, of which the utility model is a good example. The utility model provides protection for a large number of possibly less sophisticated but highly important inventions and it does not entail the complexities of an examination system, which seems to be indispensable in the field of sophisticated technology. As to examination procedures and offices, it seems that regional

cooperation between developing countries will be indispensable in order to arrive at systems which are manageable.

As pointed out before, there is no doubt that regional cooperation between developing countries is of great importance for the practical implementation of a patent policy. Only such regional considerations with the wider markets involved and the economies of scale of larger production units will make certain investments possible. This implies, of course, a consensus on problems of import and export policy and a consensus on an efficient market structure, including the element of a competition policy.

If one really wishes to increase the inflow of technology from the industrialized parts of the world, one must not only provide for a reasonably sound investment climate but also stimulate the motivation for technology export. There is no doubt that a great many technology problems and needs in developing countries could be solved with the help of knowledge and skills available in other parts of the world but that there is no motivation for the technology owner to proceed with such a transfer. This is not due to a lack of goodwill. It stems from the fact that the technology owner in the industrialized world is limited in his transfer possibilities.

It seems to me that one of the most important, and as yet untackled, problems is to awaken this dormant technology. New processes of communication must be developed and installed in order to make such dormant technology flow. It may also be necessary in certain cases to provide for financial assistance to make such transactions possible because transactions outside the normal field of business relations are difficult and often prohibitively expensive.

Finally, there is one important aspect involved in technology transfer in general, and this is the taxation problem. It seems to me that it has largely escaped the attention of all concerned and that the finance ministers of both the technology owners and the technology receivers see in this transaction mainly a phenomenon subject to taxation. Therefore, technology transfer has become an excessively expensive operation, and in many cases companies which are willing to export technology find themselves in the red even before the operation starts. Especially, of course, in the cases of what I have already called "dormant" technology, the additional tax situation might be such that any transaction would be impossible from the start.

There is no doubt that this particular situation could be remedied and that the tax barrier existing in technology transfer could be considerably lowered and perhaps even completely removed. This, of course, would presuppose that the respective national egoism which manifests itself in this taxation procedure could be eliminated by a political decision. Even intermediate measures such as a lowering of the tax barrier would, in many cases, be of considerable help. Bilateral arrangements in the form of double taxation agreements could also be of some help. Still, I wonder whether the international community could not attempt to remove this barrier completely by political consensus since in the long run the unimpeded flow of technology will be much more beneficial than the short-term benefits reaped by the respective revenue offices.

To sum up, it seems to me that the experts in the field of industrial property and technology transfer should investigate more closely issues such as dormant technology and taxation because they would probably bring about very beneficial results for the industrial development of the less developed countries, based on a consensus on the value of a system for protecting inventions.

TRANSFER OF TECHNOLOGY:
COMMENTS FROM AN INDUSTRIAL POINT OF VIEW

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I have heard many things in the past few days which lead me to believe that there is little understanding of the nature of technology. First, technology is simply the knowledge and capability necessary to perform a given task and it is generated only by actually attempting and finally performing that task. Depending upon the complexity of the task, a number of attempts may be necessary before success is achieved. However, anyone can develop technology if he is willing to spend sufficient thought, energy, time, and money, and new technology can only be obtained in this way.

On the other hand, existing technology can often be purchased. If the price asked for technology is less than it would cost you to develop it yourself, you will probably buy. If not, or if it is not available at any price, you must do the necessary research and development work if you are to obtain the technology. There is a great deal of technology available, however, and it is generally only unique, highly proprietary technology that is not for sale. Often good technology is available from several sources, and, as one speaker noted, it is a good idea to shop around, compare price and quality, and locate that technology which best suits your needs. When investigating a field of technology that is new to you, it is often difficult to make these determinations and it is wise to seek the assistance of independent experts or consultants. Such services are available at reasonable cost. Today, the vast majority of technology is available at only a fraction of the actual cost of development. Technology that has taken others many years to develop can be put into practice by licensees as quickly as they are able to absorb and understand it. A final point: technology transfer can only be accomplished

between a willing transferor and transferee--and the transferee must be capable of understanding and absorbing it. Transfer cannot be legislated. One must be willing to teach and the other willing to learn and capable of learning.

Technology is transferred generally in two ways: first, by licensing or sale as discussed above, and, second, when the owner of the technology takes it into new areas of the world for use in that market area--that is, foreign investment. Either method can work well; however, where capital is scarce or the appropriate management skills are not available, the foreign investment route can be advantageous. The foreign investor will assume reasonable risks, will build a plant, train people to operate it, obtain raw materials, develop a market for the product, etc., but the environment must be such that, if he does a good job, he can expect to make a reasonable profit. Otherwise, where is the incentive to invest his capital? Somewhat on this point, I feel I must respond to one of the speakers last Tuesday. An entrepreneur who builds a plant in a free market economy must have competitive prices or he will lose his market to another. If he wants to make a profit, he must keep his costs down. Why then would he bring in expensive foreign experts for a period any longer than is necessary to train local talent? It is of no advantage to the foreign investor to pay more than is necessary to ensure that the job is well done. In most companies with which I am familiar, it is policy to use local nationals to the extent possible, both to reduce costs and to become more of a national company.

Thus far, I have said nothing about patents and the part they can play in encouraging the transfer of technology. They can play a positive role, although it is often overstated. So, too, they could play a negative role, although this is even more overstated in view of the several remedies to prevent abuse which are available under the Paris Convention. It is true that these remedies cannot make positive things happen, but they can certainly prevent the negative things. A strong patent system offering good protection for new technology is without doubt a positive incentive to either licensing or foreign investment. It may not be sufficient reason in a given situation, but it is certainly one consideration. Why then is there activity seeking to weaken or substantially abolish patent protection? If there are remedies to prevent abuse, why limit the incentive you have available to attract what you want? Certainly I agree that patents are not provided merely to protect imports. One of the more important purposes of patents is to encourage local working and the Paris Convention provides a mechanism in support of this. Of course, no one, either foreigner or national, will want to work an invention if it is

economically unsound to do so. Not every country can afford to manufacture all products and it would be a serious mistake to attempt to do so. Bankruptcy is bad for everyone--nobody wins when this happens. On the other hand, if it makes sense to work locally and such an investment appears sound, patent owners must seriously consider working or else lose their patents and possibly their market. Again, if working requirements are reasonable, a positive bias in support of technology transfer is provided. If unreasonable, all incentives can be lost. What is there to lose by providing a strong patent system? No patent provides a monopoly position--alternatives are always available. If a patent owner attempts to charge a price which is too high, a competitor's product can always be substituted. The market will determine the fair price and a patent owner can only obtain a price consistent with the performance of his product when compared with the price and performance of other products.

Regardless of the degree of economic development of a country, technology transfer has become an important aspect of growth throughout the world. In fact, the fees which the so-called developed countries pay to each other for technology far exceed the fees paid by the so-called developing countries. Thus, an international division of labor with respect to the generation of technology does exist throughout the world, and certainly among the developed countries. The acceptance of this principle is acknowledged in their patent laws and their adherence to the Paris Convention. As large multinational companies in advanced countries have found, licensing technology and patents from others is a wise, money-saving investment, providing the base upon which to develop additional technology without wasting the time and cost of reinventing what others have already accomplished. The developing countries, through the establishment of their economic goals and through their representations in international bodies, have also emphasized the importance of technology transfer to their future development.

As implied earlier, the transfer of technology goes much further in most cases than the mere licensing of patents. In fact, it is only in a relatively small number of cases that technology can be transferred at all through a simple, raw patent license. Technology is frequently a complete system encompassing many aspects of know-how, structure, and organization.

In order to accomplish complex transfers adequately, the joint venture approach with host country principals or the creation of wholly-owned subsidiary companies is, in many cases, the most practical and efficient technique. I should note here that most companies would have to consider very

carefully investing their money and technology in a venture controlled by another who is not skilled in the business of the venture. In the process of establishing a subsidiary, it is incumbent upon the foreign company to behave as a responsible citizen and contributor within not only the letter, but also the spirit of the laws of the host country. Where the guest company has committed capital funds, this behavior becomes not only an ethical obligation, but a matter of obvious and sound business practice as well.

In spite of statements to the contrary, most responsible multinational companies have succeeded in behaving as good corporate citizens of the host country, and, particularly in those cases where the company has invested capital, the host country has available to it ample remedies for any abuses far beyond the limited scope of patent law.

In conclusion, let me speak on the comment that stated:

"We had a strong patent system for many years and economic development did not proceed--thus we deem it best to weaken or destroy the system."

There is no reason to believe that such action will speed development. On the contrary, it can only be counter-productive. The patent system, together with the remedies available to prevent abuse, can only encourage investment; it will not hinder it. In proceeding with your deliberations, give strong consideration to mechanisms for strengthening and improving the system to offer even stronger incentives--do not weaken an already difficult situation.

TERMS AND FORMS OF TRANSFER
OF SOVIET TECHNOLOGY AND KNOW-HOW
TO DEVELOPING COUNTRIES

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I. The Soviet Union is convinced of the necessity of providing free access, for the developing countries, to modern technology and, for its part, makes an active contribution to the accomplishment of this objective.

Our Government has set itself the task of expanding and enhancing economic, scientific and technological relations between the Soviet Union and the developing countries on a long-range, stable and mutually beneficial basis, facilitating the further development of national economies and economic independence of these countries and accelerating the growth of their scientific and technological potential. This course is formally adopted in the Five-Year Plan for the development of the USSR national economy over the period from 1976 to 1980, approved by the Supreme Soviet of the USSR in October 1976.

II. All types and forms of transfer of modern technology to developing countries are known in Soviet practice in this field, except the forms associated with direct investments of foreign capital in the economies of these countries. The most active and efficient form of technology transfer at the present time is economic and technical assistance to developing countries in the construction of industrial, agricultural, power, transport and other facilities, for which all the necessary research, prospecting and engineering services are rendered together with deliveries of complete equipment, missions by Soviet experts and specialists, and training of local personnel.

Deliveries of complete equipment play an especially important role, and it is no coincidence that numerous international experts are of the opinion that the concept of "acquisition of modern technology" comes down to importation of complete equipment.

Deliveries of complete Soviet equipment to developing countries within the period from 1966 to 1975 were more than two and a half times greater than the actual volume of deliveries over the preceding decade. In 1975, the volume of such deliveries was evaluated at over 1 billion dollars. In 1975, complete equipment accounted for more than half of the entire Soviet exports of machines and equipment to developing countries in Asia, Africa and Latin America. For such countries as Iran, Afganistan and Egypt, this proportion was as high as 63% to 66%, for India it was more than 70%, for Pakistan it reached 82%, and for Algeria it was even 97%.

More than 50% of total economic and technical assistance rendered by the Soviet Union to developing countries in Asia, Africa and Latin America covers the manufacturing industries. Extensive assistance in the advance of ferrous and non-ferrous metallurgy, oil-refining, petrochemical and chemical industries, mechanical engineering, metal-working and other branches of heavy and light industry necessitates not only the transfer of vast quantities of technical and technological documentation, process specifications, regulations and standards, as well as know-how, but also the training of national personnel in branches which, in many cases, are newly created in the developing countries.

According to the data available at the beginning of 1976, 1,145 different industrial enterprises, among which more than 800 have already been put into operation, have been constructed, are still under construction or are planned to be erected with the technical assistance of the USSR on the basis of agreements concluded with developing countries. Construction of further enterprises is planned to be completed mainly over the current five-year period and partly during the early years of the following five-year period.

III. Economic and technical assistance rendered by the Soviet Union to developing countries is based mainly on intergovernmental agreements providing, in addition to deliveries of complete equipment, for services on the part of Soviet organizations such as technical and economic substantiation for the construction of industrial installations, carrying out laboratory, pilot and, where necessary,

industrial tests on samples of local raw materials and developing appropriate processes for their treatment; assistance in the formulation of design instructions, elaboration of technical projects and working drawings by Soviet organizations; assistance, by Soviet specialists, in erection work and installation of equipment; start-up of production processes and, in certain cases, assistance in solving problems associated with production planning and management.

An extensive transfer of advanced technology in the form most effective and acceptable for developing countries without any restrictive terms is effected in the course of elaborating project documentation based on the most up-to-date, commercially implemented and advantageous technical solutions, as well as in the course of the construction and operation of industrial enterprises. The developing countries concerned are sole owners of the constructed enterprises and are entitled to the free disposal of the production output and to market it in both internal and foreign markets under their own trademarks. A single restriction generally included in intergovernmental agreements on economic and technical assistance is the obligation of the developing countries concerned not to transfer the technical documentation obtained from Soviet organizations to third parties without the consent of the Soviet partner.

IV. Information contained in project and technical documentation which, by its nature, has absolute or local novelty and might be the subject of associated licenses and contracts for the transfer of know-how is transmitted on a charge-free basis. The volume of technical documentation transferred for consideration and of payments received by the Soviet Union from developing countries is quite small.

A characteristic feature of Soviet license agreements concluded with organizations in developing countries resides in the fact that their terms provide the licensee with optimal opportunities for ensuring accelerated and qualitative mastering of the manufacture of the licensed article. Such agreements provide for the transfer of the complete set of technical documentation, the necessary technical assistance and the like. The grant of a license is made on terms which are economically efficient and non-binding for the receiving country. When required, machines and equipment indispensable for the start-up of production of the licensed article within a shortened time period are delivered at the option of the licensee.

Great importance for licensee-enterprises in developing countries also resides in the fact that the grant of Soviet licenses is not bound by any discriminating and economically inefficient conditions.

In particular, the grant of Soviet licenses is never accompanied by reservations in respect of so-called "tie-in" purchases of equipment, machines, materials, spare parts and pre-fabricated items which the receiving country can obtain from other sources.

The agreements concluded by Soviet organizations with licensees in developing countries involve no prohibitions as to acquisition of technology from third countries. In other words, a licensee is not artificially bound to a particular source of technology, nor is he deprived of alternatives in selecting scientific and technological achievements which appear to him optimal from the economic point of view.

The Soviet licensors do not try to fix, in license contracts, unreasonably long periods of validity of the agreement which otherwise might result in binding the licensee to technology which, with the passing of time, has become obsolete.

The Soviet organizations do not include, in license contracts, such clauses as will force the licensee to sell the licensed product at a specified price using only the licensor's marketing channels.

It should also be noted that the Soviet organizations, while granting licenses for the use of their technology to enterprises in developing countries, do not use such transfer of technology as a ground for participation in those enterprises, for any sort of supervision over their activity or for interference in the work of their management.

An important feature inherent in the Soviet practice of licensing is that the license contracts do not involve any prohibition on the carrying out by licensee-enterprises in developing countries of their own research and scientific work. Nor do these contracts require a free "back transfer" of any inventions or improvements made by the licensee in respect of the transferred technology. In turn, the Soviet licensors do not require the licensees in developing countries to buy obligatorily new inventions or improvements made by the licensor in respect of the transferred technology.

Soviet license agreements with organizations in developing countries never contain clauses of the kind which restrict the possibility of employing national personnel and reserve certain key technological and managerial posts for Soviet specialists. On the contrary, Soviet licensors take all possible measures to provide qualified training for local technical specialists, using for this purpose all known forms of training for national personnel.

V. Transfer of an enormous volume of advanced technology to developing countries on most favorable and preferential terms is also effected by sending Soviet experts on missions to these countries for the purpose of providing technical assistance in the construction and operation of different installations, accompanied by the large-scale training of local personnel. According to rather incomplete data, by the end of 1975 Soviet specialists had trained, by providing their knowledge and practical experience, more than 450,000 skilled workers, technicians and engineers in developing countries. Soviet specialists willingly share their production experience both in technology and in the planning and organization of production.

Transfer of technology and know-how during the construction and operation of industrial installations is made without any additional payment. The work of Soviet specialists under contract is paid on a reimbursement basis which is not related to the volume of knowledge and experience actually transferred to the developing countries. This payment is fixed, as a rule, at the rate of the expenses incurred by the Soviet organizations for the subsistence of their experts in the developing country concerned and reimbursement of a portion of the expert's salary earned in the Soviet Union. In respect of certain countries and categories of Soviet specialists, this reimbursement is at an even lower rate than the above-mentioned expenses.

Transfer of technological knowledge and experience without any additional payment is also made on a large scale by way of the provision, at the request of Soviet specialists, of comments and recommendations by research and project institutes of the USSR, which are then passed directly to foreign customers or used in their interests. This replaces visits to developing countries by highly-paid consultants. Nevertheless, if there is an urgent need for a short visit by the most competent Soviet experts to a particular developing country, then, as a rule, no reimbursement is paid for their services and in many cases they are "guests" of the developing country (i.e., only hotel, meal and transport expenses for trips around the country are borne by the host country).

VI. In Soviet practice, a specific form of technology transfer to developing countries is represented by assistance in establishing national design organizations in these countries. Through the work of Soviet specialists in such organizations, Soviet technology finds direct application in the industry of developing countries. As an example, a successful activity of MEKON, an Indian design organization, may be mentioned; this organization is specialized in designing, with the participation of Soviet experts, projects for enterprises in the ferrous and non-ferrous, metallurgy, mechanical engineering and other industries.

VII. Among other channels of technology transfer associated with economic and technical assistance rendered by the Soviet Union to the developing countries, the following should be mentioned:

□ Establishment of technical instruction facilities, including higher education institutes, colleges and vocational schooling centers for training qualified workers. With the assistance of the USSR, more than 250 educational centers are under construction in developing countries; 135 of them had started their activities by the beginning of 1976. All these colleges and institutes are provided with the required teaching, methodological and technical documentation. Education, especially at the initial stages, is provided with the active participation of Soviet professors, teachers and instructors of vocational training. According to incomplete estimated data, the educational centers established with the assistance of the USSR in developing countries have trained some 250,000 qualified workers and specialists.

□ More than 3,000 workers, technicians and engineers from developing countries are admitted annually to Soviet industrial plants for vocational training. During their training, they acquire all the necessary knowledge and operative skill to meet the requirements of modern technology. Such training is given at more than 100 different enterprises of various industries in the Soviet Union. This training, including the supply of training appliances and the services of interpreters, is free of charge. Developing countries pay the Soviet organizations only for the hotel and meal expenses of their specialists. In certain cases, a substantial part of these expenses is assumed by the Soviet party. The engineers, technicians and qualified workers trained in this way are employed in the construction and exploitation of the enterprises being erected with the technical assistance of the USSR.

□ In the 1975/76 academic year, 20,800 students and post-graduates from developing countries (excluding the students from Socialist States of Asia and Cuba) were studying at higher educational institutes and vocational high schools. Their education is also completely free of charge. The subsistence of students and post-graduates from developing countries is paid by the Soviet Government through scholarships awarded to these countries.

VIII. The high level of Soviet science and technology, in many cases in competition with companies from Western countries, may be illustrated by a number of examples.

□ Hydroelectric complexes in Egypt (Aswan) and Syria (Evfrat) built with the technical assistance of the Soviet Union are generally acknowledged evidence of the high international prestige of the Soviet hydroelectric school.

□ Soviet geologists were able to discover in India considerable reserves of oil (about 285 million tons) and natural gas (25 billion cubic metres), whereas Western specialists who had worked in that country earlier had given a negative opinion on the existence of oil and gas deposits in India.

□ During the second half of the fifties, three large metallurgical plants were built simultaneously in the public sector of the Indian economy with the technical assistance of the USSR (Bhilai), Great Britain (Durgapur) and West Germany (Rurkela). Of the three enterprises, the Bhilai plant turned out to be the most efficient in respect of all economic and technical parameters and this was a principal factor in the decision of the Indian Government to develop further the country's ferrous metallurgy in cooperation with the Soviet Union (expansion of the Bhilai plant and construction of a new plant in Bokaro).

□ A West German company, DEMAG, designed and constructed, over the period from 1956 to 1960, a metallurgical plant in Helwān (Egypt) with an annual capacity of 270,000 tons of steel. This plant worked inefficiently for quite a long period, and its total output of steel never exceeded 70% of the project capacity. American and British specialists invited in the place of the German metallurgists failed in their efforts to improve the working of the plant. In 1966, Soviet specialists were invited to the plant and discovered that the technological level of the West German project was quite outdated; blast furnaces were of outmoded configuration and the obsolete Thomas technology of steel smelting was the basis of the whole process (in the Soviet Union,

Thomas converters had already been discarded at the beginning of the forties). Subsequently, as a result of the active work of the Soviet specialists and their efforts in training Egyptian personnel, the Helwân metallurgical plant was put into economically effective operation after two years and the technical level of production was substantially increased. Further development of the Helwân metallurgical complex (a fivefold increase in the production of steel and reconstruction of the old part of the plant) is taking place with the assistance of the Soviet Union.

▣ The technical and economic characteristics of the Nag Hammâdi aluminium plant (Egypt), built with the technical assistance of the USSR, are considerably higher than those of the plant of about the same capacity built in Bahrain (the main contractor for equipment deliveries is KAISER, an American company). For instance, at the Egyptian plant, power consumption per ton of aluminium is 15,800 kWh and metal purity grade is 99.65%, whereas at the Bahrain plant these parameters are 16,400 kWh and 99.5% respectively.

The examples given above clearly demonstrate both the sufficiently high standard of Soviet technology and the great efficiency of the forms and channels of its transfer to developing countries.

IX. The patent policy of the Soviet Union in respect of developing countries is determined by the general principles of Soviet foreign policy based on strengthening the economic independence of these countries, rendering disinterested assistance in the development of their national economies and formation of their own industrial base.

While patenting their inventions in developing countries, the Soviet organizations do not seek to establish a monopoly in certain fields of science and technology to the detriment of the further development of national research and scientific work; nor do they try to impose such conditions as to force the developing countries to import Soviet commodities without any progress in the development of their national production of a similar profile; in other words, the USSR does not look for any unilateral benefits for itself.

On the contrary, the USSR patent policy in relation to developing countries in Asia, Africa and Latin America is directed towards the provision of favorable conditions for these countries for the unrestricted utilization of advanced Soviet technology in the interests of the development of national industry. In this context, the operative and

effective patenting of Soviet inventions in the developing countries is of great importance in the case of deliveries of complete equipment simultaneously with the provision of technology and rendering of technical assistance. National organizations of developing countries are, above all, interested in having such deliveries cover a broad assortment of different types of equipment and related technological processes not coming into conflict with the rights of patent owners from third countries since such interference could have rather serious consequences for the exploitation of industrial installations built with the assistance of the Soviet Union in the event of lack of patent protection of Soviet inventions.

Availability of Soviet patents in developing countries is a guarantee that the interested enterprises in these countries, if they intend to start up the manufacture of certain articles on the basis of Soviet technology, have the opportunity of purchasing licenses for the exploitation of Soviet scientific and technological achievements without being afraid of infringing the rights of third parties.

Consequently, patent protection of Soviet inventions in developing countries is an important means for the further consolidation and enlargement of mutually beneficial economic cooperation between the USSR and the developing countries of Asia, Africa and Latin America.

FOREIGN INVESTMENT AND COLLABORATION IN
INDIAN INDUSTRY

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INDIA'S POLICY TOWARDS FOREIGN INVESTMENT

1. Independent India's general policy towards foreign private investment was first set out in the Industrial Policy Resolution of April 6, 1948. This Resolution stated that, while it should be recognized that participation of foreign capital and enterprise, particularly as regards industrial technique and knowledge, would be of value to the rapid industrialization of the country, it was necessary that the conditions under which they may participate in Indian industry should be carefully regulated in the national interest. This Resolution also laid down that the major interest in ownership and effective control should always be in Indian hands but there could be exceptional cases which would have to be dealt with in a manner calculated to subserve the national interest. In all cases, however, the training of suitable Indian personnel for the purpose of eventual replacement of foreign experts would be insisted upon.

2. The Government of India's policy on this subject was further elucidated by the late Prime Minister Jawaharlal Nehru's statement made in the Constituent Assembly on April 6, 1949. He recognized foreign capital as an important supplement to domestic savings for the development of the country and for securing scientific, technical and industrial know-how. He assured foreign capital non-discriminatory treatment on a par with domestic enterprises in regard to industrial policy requirements, facilities for repatriation of profits and capital as well as payment of fair compensation in the event of compulsory acquisition of industrial units by the State. Although, as a rule, the

major ownership and effective control of undertakings was to be in Indian hands, he stated that there could not be a hard and fast rule in this matter.

3. There is no single or exclusive law covering the entry of new foreign investment into or the regulation of foreign enterprises in India. All proposals for entry of foreign capital into Indian industry in the form of equity, loan, capital or technical collaboration require the approval of the Government of India. Every proposal is considered on its merits and approval is given to each individual scheme. Once the entry of foreign capital or technology has been approved, such enterprise and the foreign capital involved itself receive the same treatment as Indian enterprise and capital.

LEVEL OF FOREIGN INVESTMENT

4. A total number of 5,360 cases of foreign collaboration were approved from 1948 to 1976 by the Government of India. From the level of 2,558 million Rupees in mid-1948, the total foreign private investment in the country increased by at least seven times to 17,504 million Rupees at the end of March 1972. For historical reasons, British private investment still accounts for the largest share of total foreign investments in India, though the relative share of investments from that country declined from 80.5% in 1948 to 36% in 1972. The total value of British investment, however, increased by at least three times during this period from 2,060 million Rupees in 1948 to 6,323 million Rupees in 1972. The USA is the second major investor in the country with investments valued at 4,859 million Rupees in 1972 followed by West Germany (Rs.1,351 million), Italy (Rs.841 million), Japan (Rs.547 million), France (Rs.495 million), Switzerland (Rs.497 million), Canada (Rs.281 million) and Sweden (Rs.200 million). Investments by other countries and international financial institutions accounted for the balance of 2,110 million Rupees as on March 31, 1972.

5. The outstanding long-term foreign investments for corporate industrial and commercial enterprises stood at 17,504 million Rupees at the end of March 1972. Of this investment, 59%, i.e. 9,974 million Rupees, was accounted for by "Manufacturing." Under "Manufacturing," electrical goods and machinery, and chemicals and allied products accounted for 3,701 million Rupees and 2,598 million Rupees respectively, which are 21% and 15% respectively of the total investment. "Services" accounted for 4,328 million Rupees, which is almost 25% of the total investment. Under "Services," construction, utilities and transport accounted for 2,584 million Rupees, which is 15% of the total investment.

POLICY REGARDING IMPORT OF TECHNOLOGY

6. As a general policy, the Government of India recognizes the desirability of continued inflow of progressive technology in sophisticated and essential fields where Indian technology has not been adequately developed. The association of foreign capital on a minority basis is also permitted wherever this is considered necessary. Majority foreign investment is permitted only in very special circumstances, where the concerned industry is vital and majority foreign investment is considered unavoidable. The Government's basic policy has been to promote the maximum use of indigenous resources such as raw materials, plant and equipment and technical manpower, and to conserve scarce foreign exchange. Foreign investment and collaboration has been encouraged in high-priority and specialized technology sectors so as to develop indigenous capacity in these fields as well as to promote exports. A substantial industrial base having already been created and foreign collaboration extended to both capital and consumer goods industries, a greater degree of selectivity is now being exercised so that foreign investment and collaboration is not allowed in sectors where indigenous technical know-how has already developed to an adequate level within the country. To help foreign investors, the Government of India has also issued three illustrative lists* of industries: (1) a list of industries where foreign investment with or without royalty payments may be permitted; (2) a list of industries where only foreign technical collaboration may be permitted and no foreign investment; and (3) a list of industries where no foreign collaboration--financial or technical--is considered necessary. These lists also indicate wherever possible the permissible range of gross royalty.

EQUITY PARTICIPATION

7. Proposals for majority foreign participation in new enterprises are considered only when one or more of the following important criteria are satisfied:

(i) The development of the particular industry is vital and essential in the national interest.

(ii) The field of technology involved is new, where India has made little or inadequate progress and where considerable additional development is necessary.

(iii) The project in question cannot be set up without such majority foreign equity investment.

(iv) The project is essentially an export-oriented one.

* The illustrative lists mentioned in this lecture appear at the end of the text.

8. In cases which do not satisfy the above criteria, only minority participation is normally allowed. Each case is considered on its merits and it would be difficult to lay down or rigidly adhere to any fixed percentage. The usual preference is, however, for participation of up to 40%.

9. In considering proposals for foreign investment, other important factors are also taken into account. It is necessary that effective control of the joint venture should remain in Indian hands. The total foreign exchange implications of the foreign investment and the likely savings in foreign exchange over a period of time are also to be examined.

10. An illustrative list of industries where foreign investment may be permitted has also been announced for the guidance of prospective entrepreneurs.

PAYMENT OF ROYALTY

11. Royalty has been grouped into two ranges: one up to 3% and the other up to 5%. All royalties are invariably subject to taxes. The basis for calculation of royalty is the ex-factory selling price of the product minus the landed cost of imported components irrespective of the country of supply. Payment of "minimum" royalty is not agreed to. In a limited number of cases where majority foreign capital participation is agreed to, royalty payments to the foreign collaborators have been allowed, but naturally on a substantially reduced basis. In the case of collaboration between a wholly-owned subsidiary in India and the parent company, no royalty payments to the parent firm are ordinarily agreed to, but payment towards technical services is considered on its merits in individual cases. The use of foreign brand names/trade marks is normally not agreed to on products for the internal market, although there would be no objection to the use of foreign brand names on products meant for export.

DURATION OF AGREEMENT

12. While in the past the Government of India had permitted collaboration agreements for a period of 10 years, the policy now is to restrict the period of duration to 5 years from the date of agreement or 5 years from the date of commencement of production provided that such a date is not beyond 3 years of the signing of the agreement, i.e., a maximum period of 8 years from the date of the signing of the agreement.

13. At the time of according approval to an agreement, it is stipulated that the Indian company should set up a design and research organization well within the period of collaboration agreed to, so that there would be no need for further extension of the collaboration agreement.

14. In cases where the Government is convinced that the Indian party has not been able to assimilate the technical know-how to be imported from the foreign collaborator within the period of the agreement, the agreement is generally allowed to be extended.

RENEWAL OF COLLABORATION AGREEMENT

15. Applications for extension of collaboration agreements are scrutinized with great care, and extensions are agreed to only in those cases where the Government is satisfied that there is a need for it. Applications for extension may be considered in the following circumstances:

- (i) If the item of manufacture is sophisticated and it is necessary that the period of collaboration should be extended for a short period to enable the Indian party to absorb the know-how.
- (ii) If the collaboration agreement involves the manufacture of a large number of items and the Indian party could start manufacturing some of the items only at a later stage. In such cases, extension is granted only in respect of those few items whose manufacture started later.
- (iii) If it is felt that such extension would be in the interest of exports of the manufactured product.
- (iv) If no further royalty is proposed to be paid during the period of extension.

Even where extensions are considered and granted, every effort is made to reduce the rate of royalty payable, with regard to the nature of the product and the period of extension.

EXPORTS

16. With a view to promoting exports of non-traditional products, the following points are kept in view:

(i) when existing collaboration agreements which substantially limit export franchise come up for renewal, such restrictions are sought to be removed;

(ii) new agreements are scrutinized to ensure as unrestricted an export franchise as possible;

(iii) in low-priority or non-essential fields of production where foreign collaboration is generally not considered necessary, a relaxation may be made where the foreign collaborator agrees to undertake a major share of the production for exports; and

(iv) the existing policy of not allowing foreign collaboration in trading activities may be relaxed where such collaboration is exclusively aimed at augmenting export sales.

CO-ORDINATED PURCHASE OF KNOW-HOW

17. While considering applications for foreign collaboration, the importance of avoiding repetitive import of know-how for the same or a similar product or process is kept in view. Also, to the extent practicable, fresh entrants are asked to obtain the know-how imported by those already in the field. In many of the existing agreements, there is a secrecy clause. The policy now is to ensure that there is a provision in the agreement to the effect that the technical know-how/product design/engineering design can be passed on to another Indian party, should it become necessary, on terms mutually agreed to by all the parties concerned, including the foreign collaborator, subject to the approval of the Government.

18. In fields where there is a likelihood of more than one unit of the same industry being set up at about the same time and all of them are likely to require foreign collaboration, efforts are made to conduct negotiations for acquisition of know-how for these units in a co-ordinated manner.

INDIAN CONSULTANCY

19. To ensure the maximum possible utilization of Indian consultancy services, it is enjoined upon Indian firms at

the time of approving foreign collaboration that, wherever Indian consultancy is available, it should be utilized exclusively and, if foreign consultancy is also required, Indian consultants should also be associated and as a rule be the primary agency for consultation.

STREAMLINING OF PROCEDURES

20. A general complaint by foreign investors has been about time-consuming procedures and the uncertainty in their minds as to what terms would be acceptable to the Government. In order to avoid undue delays in the disposal of applications for foreign investments/collaborations and in order to streamline the various procedures, the Government established in December 1968 a single agency within the Government called the Foreign Investment Board, which is now responsible for all matters relating to approval of foreign private investments and collaboration. While the Chairman of the Foreign Investment Board is the Secretary to the Government of India, Department of Economic Affairs, in the Ministry of Finance, the Secretariat for the Foreign Investment Board is in the Ministry of Industry.

21. Since its inception in December 1968 up to 1976, the Foreign Investment Board held 221 meetings. During this period the total number of foreign collaboration cases approved was 1,996. The number of foreign collaboration cases involving foreign equity participation approved during this period was only 312.

22. As part of the process of further streamlining procedures and assisting entrepreneurs in obtaining expeditious approvals including foreign collaboration proposals, the Government of India set up on November 1, 1973, a unified secretariat for industrial approvals including foreign collaboration approvals. This Secretariat, called the Secretariat for Industrial Approvals, has been functioning as a division in the Ministry of Industry. The essential objective of the new system is to issue various clearances within a defined time limit. The time limit for disposal of foreign collaboration applications is 90 days from the date of receipt of such applications. As on 31.12.76 there were only two cases of foreign collaboration pending for more than the prescribed period of 90 days out of an annual receipt of more than 500 applications.

TREATMENT OF EXISTING FOREIGN COMPANIES

23. As regards foreign majority companies operating in India, the Government of India has laid down detailed

guidelines for the reduction of foreign holdings in such companies when they come up to the Government for approval of any new expansion schemes. According to these guidelines, while approving such expansion, the Government has laid down the following formula to arrive at the amount of additional equity that the company should raise from Indian shareholders:

- (i) 40% of estimated cost of expansion in the case of companies with foreign holding exceeding 75%;
- (ii) 33 $\frac{1}{3}$ % of estimated cost of expansion in the case of companies with foreign holding exceeding 60% but not exceeding 75%;
- (iii) 25% of estimated cost of expansion in the case of companies with foreign holding exceeding 51% but not exceeding 60%.

The cost of expansion, referred to in this formula, represents the cost of the land, buildings, and plant and machinery required for the expansion.

24. In 1973, the Foreign Exchange Regulation Act was consolidated and amended and new guidelines were issued by the Government of India. According to these guidelines, companies engaged in manufacturing activities in the core sector or using sophisticated technology or exporting 60% or more of their production or in tea plantations may be permitted to retain non-resident interest up to 74%. In the case of 100% export-oriented units, foreign equity participation of even more than 74% could be allowed on the merits of each case. Other categories of companies have had to bring down their non-resident interest to 40%. Alternatively they could change their character to predominantly manufacturing activities in the core sector or increase their exports to at least 60% of their production. These guidelines were recently amplified to allow companies to retain non-resident interest up to 51%, provided their activities in the core sector together with activities requiring sophisticated technology and exports account for not less than 60% of their total annual turn-over; the company concerned should, however, also undertake to export a minimum of 10% of the total turn-over within a period of two years. Similarly, any company which had more than 40% of its total annual turn-over as exports could also be allowed to retain 51% non-resident interest.

INDIAN JOINT VENTURES ABROAD

25. With regard to joint ventures with Indian equity participation abroad, the Government of India has always desired that the Indian collaborator should normally have only a minority shareholding unless the local party abroad and his Government wish otherwise. While considering such applications for Indian joint ventures abroad, the Government of India also takes into account the manufacturing and business expertise of the Indian party, adequacy of preparation of feasibility studies/project reports for the proposed undertaking, proposed methods of financing, management set-up, marketing arrangements, etc. The Government of India also favours provisions in the collaboration agreements for training facilities in India for the nationals of the country of investment.

26. The number of Indian joint ventures abroad has been steadily increasing. It has gone up from 162 to 268 during the last 3 years. This is due to an increasing awareness in developing countries of India's capability to help them to set up industries. Also, there is greater confidence among Indian industrialists to venture abroad.

[Illustrative lists follow]

ILLUSTRATIVE LIST FOR FOREIGN COLLABORATION

LIST I(A)

Illustrative List of Industries Where Foreign
Investment May Be Permitted

Industry	Royalty Range
----------	---------------

Oil and Chemical Industries

(i) Fertilizers (other than single super-phosphate)	No royalty
(ii) Selected pesticides	up to 5%
(iii) Off-shore oil exploration	No royalty
(iv) Oil refining including the production of oil	-
(v) Special additives and chemicals required for the oil industry	up to 4%
(vi) Petro-chemicals (not otherwise specified)	up to 5%
(vii) Thermo plastics	up to 3%
(viii) Synthetic rubber	up to 5%
(ix) Detergent alkalytes	up to 5%
(x) Certain drugs and pharmaceuticals	up to 5%
(xi) Edible, pharmaceutical, photographic and special gelatine	up to 3%

Paper, Pulp and Allied Industries

(i) Newsprint	No royalty
(ii) Speciality papers like electrical insulation papers and boards such as cable paper, condenser paper, presspahn, press board, leatheroid, photo base paper and special types of filter paper	up to 3%
(iii) Paper and board makers' felts	up to 3%

Rayon and Synthetic Fibre Industries

Nylon and polyester yarn/fibre including industrial yarn, polypropylene fibre polyvinylalcohol fibre, acrylic fibre	up to 20 paise per Kg.
---	------------------------

List I(A), page 2

Industry	Royalty Range
----------	---------------

Asbestos and Carbon Products

- | | |
|-----------------------------------|----------|
| (i) Asbestos packing and jointing | up to 3% |
| (ii) Graphite electrodes | up to 3% |

Timber-based Industries

- | | |
|---------------------|------------|
| (i) Fibre board | No royalty |
| (ii) Particle board | No royalty |

- | | |
|---|----------|
| Refractories (special types including electro-cast refractories) | up to 3% |
| High tension insulators and bushings and solid core insulators for railways | up to 3% |
| Abrasive grains | up to 3% |

Industrial Machinery

- | | |
|---|------------|
| (i) Cylindrical, tapered, spherical and other special bearings (excluding ball bearings) | up to 5% |
| (ii) Some items of textile machinery like combers, automatic pirn winding and warp winding machines, processing and finishing machinery | up to 5% |
| (iii) Jute machinery (certain selected items) | up to 5% |
| (iv) Rayon machinery | up to 5% |
| (v) Specialized printing machinery (for example. royalty printing presses, offset printing presses and composing machinery, etc.) | up to 5% |
| (vi) Rubber processing machinery | up to 5% |
| Seamless tubes | No royalty |
| Cast iron, cast steel and forged rolls | up to 3% |
| Specialized items of chemical and pharmaceutical machinery | up to 5% |
| Silicones | up to 5% |
| Catalysts | up to 5% |
| Commercial explosives | up to 3% |
| Watches | up to 3% |
| Standard and portable typewriters | up to 3% |
| Electric typewriters | up to 3% |
| Data processing machines | up to 5% |
| Calculating and adding machines | up to 3% |

Industry	Royalty Range
Precision measuring tools	up to 3%
Machine tools and accessories (selected types)	up to 5%
Programme control equipment	up to 5%
High duty wharf and floating cranes of all types	up to 5%
<u>Electrical Engineering Industries</u>	
(i) Electro-magnetic and time relays	up to 5%
(ii) Railway electrical signalling	up to 3%
(iii) HRC fuses	up to 3%
(iv) Germanium and silicon diodes	up to 3%
(v) Dry cells and train lighting cells	up to 3%
(vi) Electronic instruments and selected electronic components	up to 5%
(vii) Selected measuring instruments	up to 5%
(viii) Electro-medical, optical and dental instruments and equipment for medical profession	up to 5%
(ix) DC motors and controls	up to 3%
(x) Transistors and very high frequency electrical equipment	up to 3%
(xi) LT and HT circuit breakers	up to 3%
(xii) Power cables above 11 KV	up to 3%
<u>Earth-moving Equipment</u>	
(Crawlers, tractors, scrapers, excavators, blast hole drills, heavy duty dumpers and haulers, pay loaders, tractor shovels, tyre mounted cranes)	up to 5%
Power tillers	up to 3%
Specialized automobile ancillaries	up to 5%
Industrial gases (oxygen, nitrogen, hydrogen, carbon dioxide, acetylene)	No royalty
Mine safety/rescue appliances	No royalty
Gas testing apparatus for mines	No royalty
<u>Selected Ferro Alloys</u>	up to 3%
Ferro-molybdenum	
Ferro-titanium	
Ferro-tungsten	
Ferro-vanadium	

Industry	Royalty Range
<u>Non-ferrous Metals</u>	up to 5%
Copper	
Zinc	
Lead	
Iron ore including processes for agglomeration of ore fines	up to 3%
Consultancy engineering	No royalty
<u>Glass Industry</u>	
Polished plate glass laboratory glass-ware	up to 3%
Deep sea fishing	

LIST I(B)

Illustrative List of Industries Where Only Foreign
Technical Collaboration May Be Permitted
(but not Foreign Investment)

Industry	Royalty Range
I. <u>Paper, Pulp and Allied Industries</u>	
(i) Special grades of papers such as natural tracing paper, vegetable parchment paper, cigarette paper, carbonizing tissues, stencil base tissues, tabulating manila paper, high strength kraft paper like sack kraft, waxing, laminating and impregnation base papers, vulcanized fibre sheets, abrasive body paper, chart paper, indicator paper	up to 3%
(ii) Tyre-cord and special chemical pulp	
II. <u>Rubber Goods Manufacturing Industry including Tyres & Tubes</u>	
Rubber contraceptives, meteorological balloons, fire fighting hoses, tennis balls, rubber thread used in hosiery, automobile tyres and tubes	up to 3%
III. <u>Chemical Industries</u>	
Alkylamines, rubber chemicals, fluorinated hydro-carbons, carbon tetrachlorides, trichloroethylene, glycol ethers, propylene oxide	up to 3%

Industry	Royalty Range
----------	---------------

IV. Asbestos and Carbon Products

- | | |
|---|----------|
| (i) Midget electrodes and other special carbon products | up to 3% |
| (ii) Graphite crucibles | up to 3% |

V. Timber-based Industries

- | | |
|-------------------------|----------|
| Moulded particle boards | up to 3% |
|-------------------------|----------|

VI. Electrical Engineering Industries

- | | |
|--|------------|
| (i) Transformers above 1000 KVA | } up to 3% |
| (ii) AC motors above 30 HP | |
| (iii) Fractional horsepower motors | |
| (iv) Variable speed motors | |
| (v) Power-line carrier equipment | |
| (vi) Lighting arrestors | |
| (vii) Selected categories of insulation material for electrical industries | |
| (viii) Flame-proof lamp fittings | |
| (ix) Electric lamps (photo flash pre-focus, infra-red, ultra-violet, mercury vapour telephone switchboard) | |
| (x) Lamp components (lead-in wire, filament and fluorescent powder) | |
| (xi) Controls of refrigerators and air-conditioners | |
| (xii) Specialized surgical equipments, such as blades, needles, etc. | |
| (xiii) AC motor starters for motors above 30 HP | |
| (xiv) Hearing aids | |
| (xv) Crane control gear | |
| (xvi) Power capacitors | |
| (xvii) CTS and PTS for measuring and protection |  | up to 5% |

Industry	Royalty Range
----------	---------------

VII. Metallurgical Industries

- | | |
|--|------------|
| <ul style="list-style-type: none"> (i) SG iron castings (ii) Alloy iron castings (iii) Non-ferrous semis not produced in the country at present | } up to 3% |
|--|------------|

VIII. Industrial Machinery Industries

- | | |
|--|------------|
| <ul style="list-style-type: none"> (i) Coal and ash handling plant (ii) Printing machinery (iii) Gears and gear boxes (iv) Metallurgical equipment including foundry equipments (plant and machinery for such items as LD converters, rolling mills, special features of blast furnaces for giving improved productivity and coke ovens and by-product plants) (v) Chemical and fertilizer plant (vi) Oxygen and acetylene plant (vii) Ceramic machinery (viii) Pulp and paper mill machinery (ix) Food processing machinery (x) Accelerated freeze drying plant (xi) Mineral beneficiation plants (xii) Specialized equipment for air conditioning and refrigeration and air control equipment such as centrifugal compressors, low temperature freezers, transport refrigeration equipment, electrostatic precipitators, silos, etc. (xiii) Mining machinery: hydraulic props and electric drills | } up to 5% |
|--|------------|

List I(B), page 4

Industry	Royalty Range
(xiv) Any specialized item for industrial machinery other than those particularly excluded, <u>vide</u> list of industries where no foreign collaboration (financial or technical) is considered necessary	up to 5%
<u>IX. Cutting Tools</u>	
Selected cutting tools	up to 5%
<u>X. Other Miscellaneous Industries</u>	
(i) Improved types of agricultural implements and machinery	up to 3%
(ii) Pesticides application equipment (special types)	up to 3%
(iii) Time-pieces (non-conventional)	up to 3%
(iv) Industrial sewing machines	up to 5%
(v) Gas appliances	up to 3%
(vi) Hair-spring and other types of delicate and complicated springs	up to 5%
(vii) Industrial precision roller chains bigger than 5/8" pitch, simplex, duplex and triplex bush chains, special roller chains for mechanical handling, bush slot bank, trolley conveyor chains, hollow bearing pin type chains	up to 5%
(viii) Special bicycle components, such as multispeed hubs, with trigger and twist control	up to 3%
(ix) High pressure pipe fittings of specialized type other than malleable iron fittings	up to 3%

Industry	Royalty Range
(x) Ships' chains and alloy steel chains other than ordinary mild steel welded link chains	up to 3%
(xi) Sophisticated types of valves and cocks	up to 5%
(xii) Fishing hooks	up to 3%
(xiii) Superior quality sanitary fittings	up to 3%
(xiv) Thermo-setting moulding materials	No royalty
(xv) Fatty alcohols	No royalty
(xvi) Electro-plating chemicals	No royalty
(xvii) Welding fluxes	No royalty
(xviii) Foundry chemicals	No royalty
(xix) Dye-stuffs and intermediates	up to 3%
(xx) Iron ore pelletization including production of sinter feed	No royalty
(xxi) Alumina	No royalty
(xxii) Safety razor blades and safety razors	up to 5%
(xxiii) Alloy and special steels including: cold rolled grain oriented sheets, special alloy steel, tin-free double reduced or single side-plated tin plates, coloured galvanized sheets, plastic coated sheets, other special items of steel, etc.	up to 3%
(xxiv) Wire thinner than 19g and special wire	up to 3%
(xxv) Chemical porcelain	up to 3%
(xxvi) Welding electrodes (special types)	up to 3%
(xxvii) Duplicators (special types)	up to 3%
(xxviii) Machine screws (special types)	up to 3%
(xxix) Steel mill cranes (class IV duty)	up to 5%

List I(B), page 6

- Note:
- (1) This list indicates the fields where foreign investment is not likely to be required for setting up new units. This does not, however, preclude the expansion of existing joint ventures.

 - (2) Foreign investment is also not precluded in any composite scheme of manufacture where the production of any of the above items is envisaged along with other major items for the manufacture of which foreign investment is welcome.

LIST II

List of Industries Where No Foreign Collaboration
(Financial or Technical) is Considered Necessary

1. Paper, Pulp and Allied Industries

Common grades of printing, writing, packing and wrapping paper and boards, e.g., white printing papers, azure; cream laid and woven papers; art paper and board; litho offset paper; drawing and cartridge paper; MG poster; bank and bond paper; airmail paper; cheque paper; typewriting paper; manifold paper; ledger paper; kraft paper; match paper; greaseproof and glassine paper; ordinary MG tissue paper; blotting paper; straw boards; grey board; carbon paper; typewriter ribbons; VPI paper.

2. Rubber Goods

Bicycle tyres and tubes; tyre retreading material; rubber and canvas footwear; conveyor belting; industrial and agricultural hoses; automobile rubber components; rubberized fabrics; latex foam; industrial and surgical gloves; medicinal rubber goods such as vaccine and other injectible bottle vials; ice cups and hot water bottles and reclaim rubber.

3. Chemical Industries

Formaldehyde; acetic acid; esters of acetic acid like ethyl acetate; butyl acetate, formic acid; monochloro-acetic acid; ethyl chloride; methyl bromide; chloroform; methylene chloride; chlorobenzene plasticizers (phthalate-batch process); oxalic acid; chlorinated paraffins; beer; erthenol; penta erythritol; aniline.

4. Leather and Leather Goods Industries

Glue/technical gelatine; vegetable tanning extracts; pickers; picking bands; leather belting; cotton and hair finished leather; leather footwear; synthetic tanning materials.

List II, page 2

5. Rayon and Synthetic Fibres Industries
Viscose filament yarn/staple fibre viscose tyre yarn.
6. Asbestos and Carbon Products
Asbestos cement products; pencils.
7. Timber-based Industries
Tea-chest plywood; commercial plywood; matches.
8. Glass Industry
Sheet glass; table and pressed ware; vacuum flasks; enamel-ware; container-ware.
9. Cement and Cement Products
Cement, RCC pipes, pre-stressed and pre-tension cement products, building bricks and roof tiles.
10. Ceramic Industry
Sanitary-ware; glazed tiles; crockery.
11. Castings
Grey casting; steel casting.
12. Electrical Engineering Industries
Distribution transformers; power transformers 1000 KVA and below; AC motors below 30 HP; electronic components (ferrite, transformer coils, telescopic aerials, ceramic capacitors), cables(except power cables above 11 KV), iron clad switches; winding wires and strips, hospital wares; electric fans; domestic refrigerators; domestic air-conditioners; commercial radio receivers; house service meters; ammeters and volt-meters other than sub-standard multimeters; storage battery.
13. Industrial Machinery
Sugar machinery; cement machinery; conveyors; LP gas cylinders; coal mining machinery (except hydraulic props and electric drills).

Coal washery plant; building and constructional machinery except specialized items; poultry equipment; pesticides application equipment (other than special type equipment); milk and dairy machinery except specialized items, cooking powers; tea processing machinery; oil mill machinery; water treatment plant; solvent extraction plant; rice mill machinery of conventional type; weighing machinery except specialized items; cold formed sections and slotted angles; tabular structural railway wagons; railway mechanical and signalling equipment; railway points and crossings; steel doors, windows and rolling shutters; wire ropes (other than bicable ropeways); lifts; welding electrodes (other than special types); bright bars; welded GI steel pipes and tubes; conduit pipes; electric hoist block and chain pulley block; transmission line towers; rail and road bridges; structural (light, medium and heavy).

14. Machine Tools and Small Tools

Forged hand tools (spanners, pliers, etc.); steel files (except export-oriented); twist drills; general purpose machine tools (simple types).

15. Other Industries

Drums and barrels; collapsible tubes; crown corks; pilfer-proof seals and closures; hurricane lanterns; chaff-cutter knives; buckets; domestic utensils and cutlery; agricultural implements and machinery (manual and animal drawn); clocks; time-pieces (conventional); franking machines; duplicators (other than special types); oil pressure stoves; belt fasteners; steel belt lacing; spectacle frames; oil pressure lamps; hand sewing and gramophone needles; addressing machines.

Pressure cookers; domestic sewing machines; air rifles; cigarette lighters; bicycles and bicycle parts; ball bearings (only steel balls); leaf springs; zip fasteners; grinding media; coil springs excluding hair and other delicate and complicated springs.

Snap fasteners; toys, bolts, nuts, rivets, dogspikes of all types excluding specialized types of rivets; wood screws other than with special recessed heads; mild steel welded link chains other than ships' chains and alloy steel chains; machine screws other than

List II, page 4

specialized types; pipe fittings other than specialized types; locks; valves and cocks (other than specialized); shoe grindery; builders' hardware; welded wire mesh; wire gauge and netting; oil milling; solvent extraction of oil cakes; soap; synthetic detergents (formulations), fatty acids; textile auxiliaries; paints and allied products.

- Note: (1) This list indicates the fields where foreign investment is not likely to be required for setting up new units. This does not, however, preclude the expansion of existing joint ventures.
- (2) Foreign investment is also not precluded in any composite scheme of manufacture where the production of any of the above items is envisaged along with other major items for the manufacture of which foreign investment is welcome.

List of Industry-wise Break-up of Foreign Collaboration
Cases Approved by the Foreign Investment Board of the
Government of India from 1969 to 1976

Sr. No.	Name of Industry	1969	1970	1971	1972	1973	1974	1975	1976
1	2	3	4	5	6	7	8	9	10
1.	Metallurgical Industries	6	11	10	13	11	23	19	12
2.	Fuels	-	-	-	-	1	1	-	-
3.	Boilers and Steam Generating Plants	1	1	1	3	3	5	3	1
4.	Prime Movers (Other than Elect. Generators)	1	4	-	1	-	4	-	1
5.	Electrical Equipment	19	22	52	39	55	72	53	63
6.	Telecommunications	2	4	-	-	1	-	-	-
7.	Transportation	17	15	16	19	31	34	15	18
8.	Industrial Machinery	18	34	32	45	54	69	50	57
9.	Machine Tools	12	6	28	19	19	14	12	19
10.	Agricultural Machinery	10	3	13	-	1	-	-	-
11.	Earth-moving Machinery	1	-	1	2	2	-	1	1
12.	Miscellaneous Mechanical & Engg. Industries	4	6	4	7	11	13	9	13
13.	Commercial, Office & Household Equipment	-	-	6	4	6	5	1	1
14.	Medical and Surgical Appliances	-	1	1	2	1	4	3	1

Industry Break-up List, page 2

1	2	3	4	5	6	7	8	9	10
15.	Industrial Instruments	5	3	4	3	2	6	2	4
16.	Scientific Instruments	1	-	-	1	1	-	-	1
17.	Mathematical, Surveying and Drawing Instruments	-	-	-	-	-	-	1	-
18.	Fertilizers	-	1	-	-	-	-	-	-
19.	Chemicals (Other than Fertilizers)	17	10	37	31	16	41	40	36
20.	Photographic Raw Film and Paper	-	1	-	-	-	-	-	1
21.	Dyestuffs	-	-	1	-	-	-	1	-
22.	Drugs & Pharmaceuticals	-	3	2	1	3	-	2	1
23.	Textiles (Including those dyed, printed & otherwise processed)	1	1	5	2	1	5	3	2
24.	Paper and Pulp, including Paper Products	3	1	4	5	6	6	-	2
25.	Sugar	-	-	-	-	-	-	-	-
26.	Fermentation Industries	-	2	1	3	1	-	-	-
27.	Food Processing Industries	1	-	1	-	1	2	4	2
28.	Vegetable Oil & Vanaspathi	-	-	-	-	-	-	-	1
29.	Soaps, Cosmetics & Toilet Preparations	-	-	-	-	-	-	1	-
30.	Rubber Goods	-	8	1	8	5	12	9	4
31.	Leather, Leather Goods and Pickers	1	-	3	1	1	3	4	1

Industry Break-up List, page 3

1	2	3	4	5	6	7	8	9	10
32.	Glue and Gelatine	-	-	2	-	1	1	2	-
33.	Glass	1	1	4	2	6	5	2	5
34.	Ceramics	1	2	4	4	3	5	7	7
35.	Cement and Gypsum products	-	1	1	1	1	1	2	4
36.	Timber products	1	1	1	-	-	2	2	-
37.	Defence Industries	-	-	-	-	-	-	-	-
38.	Cigarettes	-	-	-	-	-	-	-	-
39.	Consultancy	3	6	1	6	1	6	6	-
40.	Misc. (Non- scheduled industries)	9	35	9	35	20	20	17	23
<u>TOTAL:</u>		<u>135</u>	<u>183</u>	<u>245</u>	<u>257</u>	<u>265</u>	<u>359</u>	<u>271</u>	<u>281</u>

STATEMENT SHOWING COUNTRY-WISE BREAK-UP OF THE FOREIGN
COLLABORATION CASES APPROVED BY THE FOREIGN INVESTMENT
BOARD OF THE GOVERNMENT OF INDIA FROM 1969 TO 1976

S. No.	Name of the Country	1969	1970	1971	1972	1973	1974	1975	1976
1	2	3	4	5	6	7	8	9	10
1.	Australia	1	3	3	5	1	3	-	4
2.	Austria	-	3	1	1	2	1	1	3
3.	Bahamas	-	-	-	1	-	-	-	-
4.	Bermuda	-	2	1	-	-	-	1	-
5.	Belgium	-	1	3	4	1	5	5	1
6.	Bulgaria	-	-	-	-	1	-	-	-
7.	Canada	2	-	1	1	2	3	6	1
8.	Czechoslovakia	1	5	5	6	5	5	3	1
9.	Denmark	2	1	2	1	3	4	-	4
10.	Federal Republic of Germany (FRG)	28	36	42	49	60	71	59	60
11.	Finland	1	1	-	-	-	3	1	-
12.	France	7	7	16	14	13	22	13	17
13.	German Democratic Republic (GDR)	5	5	5	3	4	2	3	7
14.	Greece	-	1	-	-	-	-	-	-
15.	Hongkong	-	-	-	-	2	-	1	-
16.	Hungary	1	1	1	3	1	2	1	2
17.	Netherlands	3	3	4	4	2	3	1	6
18.	Iceland	1	-	-	-	-	-	-	-
19.	Ireland	-	-	-	-	2	2	-	-
20.	Italy	3	8	4	8	5	16	10	8
21.	Japan	17	15	35	27	38	28	23	10
22.	Kenya	-	1	-	-	-	-	-	-
23.	Luxembourg	-	-	-	6	-	1	1	-
24.	Malaysia	-	-	-	-	-	1	-	-

Country Break-up List, page 2

1	2	3	4	5	6	7	8	9	10
25.	New Zealand	-	-	1	-	-	-	-	-
26.	Norway	-	1	1	1	1	2	-	2
27.	Poland	-	-	-	-	1	-	-	2
28.	Romania	2	-	-	-	1	1	1	-
29.	Spain	-	-	1	-	-	2	-	1
30.	Switzerland	7	13	14	15	10	33	27	22
31.	Sweden	2	3	3	4	7	11	4	6
32.	Uganda	-	1	-	-	-	-	-	-
33.	UK	34	39	55	38	53	59	54	54
34.	USA	18	33	43	62	48	79	55	69
35.	USSR	-	-	4	3	1	-	-	1
36.	Yugoslavia	-	-	-	1	1	-	1	-
		135	183	245	257	265	359	271	281

LIST OF APPROVED INDIAN INDUSTRIAL
JOINT VENTURES ABROAD

(as on 31.3.1976)

S.No.	Name of Country	Total
1.	Afghanistan	6
2.	Australia	1
3.	Canada	5
4.	Colombia	1
5.	Cyprus	1
6.	Doha Qatar	1
7.	Dubai	5
8.	Ethiopia	6
9.	Fiji	2
10.	Federal Republic of Germany	3
11.	Ghana	1
12.	Grenada	1
13.	Hongkong	2
14.	Indonesia	15
15.	Iran	10
16.	Iraq	2
17.	Ireland	2
18.	Kenya	15
19.	Lebanon	1
20.	Libya	1
21.	Malaysia	44
22.	Mauritius	12
23.	Muscat (Sultanate of Oman)	2
24.	Nepal	1
25.	Nigeria	10
26.	Philippines	4
27.	Saudi Arabia	4

Joint Venture List, page 2

<u>S.No.</u>	<u>Name of Country</u>	<u>Total</u>
28.	Senegal	1
29.	Singapore	9
30.	Sri Lanka	11
31.	Tanzania	3
32.	Thailand	7
33.	Togo	2
34.	Trinidad	1
35.	Uganda	1
36.	UK	4
37.	USA	7
38.	Yemen Arab Republic	1
39.	Zambia	5
	TOTAL	<u>210</u>

TRANSFER OF TECHNOLOGY:
MYTH AND REALITY

Hon. Senator Kamarul Ariffin

Chairman, Bank Bumiputra Malaysia Berhad,
President, ASEAN Chamber of Commerce and Industry,
Malaysia

I. Introduction

1. I would like to focus my attention on the transfer of technology from the developed countries to the developing countries. This does not imply that technology transfers among developed countries are not significant or that transfers among these countries are free from problems and difficulties. On the contrary, technology transfers among the developed countries can be even more complicated. My prime consideration is based on the fact that while, on the one hand, the developed countries have always had the monopoly of technological know-how, on the other, the developing countries have always looked forward eagerly to acquiring whatever modern technology may come their way in order to accelerate the rate of growth in their respective economies. To illustrate this gross imbalance in the present distribution of technology, Mr. Surendra J. Patel has shown in his article in the "Journal of Modern African Studies" that of some three million-odd patents registered all over the world, only some 20,000, that is, about 0.7%,¹ are owned by enterprises or persons in developing countries. This state of affairs may be perpetuated or even aggravated unless some bold positive measures are taken to arrest it in time.

¹ Surendra J. Patel: The Technological Dependence of Developing Countries in the "Journal of Modern African Studies," Vol. 12 (1974), No. 1, page 12.

2. I also wish to say that, although technology transfer may take various forms and operate through numerous channels, I shall concentrate mainly on transnational companies which have direct investments or have established joint-venture companies in the developing countries. It is not my intention to use this forum as a vehicle to criticize the transnational companies for or on behalf of the developing countries. Indeed, for the past quarter of a century, imported technology and science-based findings brought mainly by transnational companies have contributed significantly towards the progress and the material betterment of the peoples of developing countries. This fact is indubitable; so tremendous was the impact that even today there are still many developing countries which are indifferent towards the plea of their fellow developing countries for better terms from the developed countries in the transfer of technology.

3. The fact at hand is that there exists an imperfect market for the commodity called "technology" in which the "sellers," that is, the transnational companies from the developed countries equipped with the knowledge, expertise and know-how, are placed in a much better position to bargain for the price as well as the terms and conditions of the sale, while the "buyers," that is, the developing countries, have never been united in the deal, nor have they been adequately equipped with the finesse required for the transaction. It is typical of any imperfect market that the price the developing countries have to pay for technology transfer can be prescribed by the transnational companies. The essence of my discussion is, therefore, to identify and analyze these characteristics of technology transfer based on the experiences of some selected countries. Subsequently, I shall attempt to put forward my ideas and suggestions on how some of the major weaknesses, unfairness and irregularities could be remedied.

II. Diverging Attitude and Perceptions Towards the Transfer of Technology

4. Let us first examine the attitude and perceptions of both the transnational companies and the developing countries. In so far as the transnational companies are concerned, the technology which they possess, either in the form of product design, production techniques or pure know-how, is something that they treasure and must be kept secret or protected by patents or trademarks. Is this not the reason for which the various Conventions were established? Parting with any of them must therefore be at a price. For many of the developing countries, the quest for imported technology arose largely from the overall development strategy, that is, the need to accelerate their industrial development and growth, to

diversify their exports, to create employment opportunities, to meet local demand for specific goods and, perhaps most important of all, to provide training opportunities for their own nationals in the hope that they, in due course, not only would acquire the technological know-how but would also be able to spread the expertise to other local people. However, this will only be achieved if the transnational corporations understand these aspirations and, at the same time, are genuinely willing to help developing countries to attain them. Unfortunately, this is not always so in reality. Transnational corporations invariably regard their expansion into developing countries as part of their effort to strengthen their worldwide inter-connected network. Their consideration and decision to penetrate into a particular developing country is guided by the overall corporate objective of maximizing profits. The extent and the nature of the transfer of the technology that is brought into the developing country concerned is also dependent on a host of other factors such as the investment climate of the country vis-à-vis other countries, the market potential of the country, the possibility of bringing expatriates into the country, etc. Similarly, their policies on exports, use of machinery and equipment, employment and training of local staff, as well as purchase of raw materials, are all determined by their head office, which, as stated earlier, is guided by the profit motive.

5. Owing to the divergent attitudes and perceptions, the ability of the transnational corporations to fulfil the aspirations of the host country are, at best, a coincidence, failing which the two parties will always find themselves entangled in all kinds of disputes and misunderstandings. I have thus demonstrated that even from the point of view of attitude alone, the hopes and dreams of developing countries to benefit from the transfer of technology by transnational companies are more of a myth than a reality.

III. Restrictive Conditions in Technology Transfer

6. The attitudes of transnational companies towards a country are, in essence, reflected by the contents of the agreements which they enter into with individual firms in that country. An agreement on the transfer of technology contains, inter alia:

(i) the extent of the transnational company's operations, that is, whether it is a full-range operation or merely an assembly plant;

(ii) the sources of raw materials, intermediate products or spare parts could be restricted to imports from the transnational company's head office or from a specified group of companies associated with the parent company;

(iii) prohibition of transfer, assignment or sub-licensing of know-how outside the company;

(iv) employment of a specified number of staff and their specific skills from the transnational group of companies as well as the provision of training for local staff;

(v) restriction on market outlets for the products, such as limiting them only to the transnational parent company or limiting the volume of exports, as well as the prices of the product;

(vi) no obligation on the transnational companies to share any information obtained from research and studies with the local establishment of the company while the reverse flow is made obligatory--thus becoming a one-way flow.

7. Allow me now to examine closely each of the prominent aspects in order to appreciate and understand their implications especially for the developing countries. Wherever empirical evidence is available, I shall attempt to illustrate it further.

8. Any developing country, or for that matter even any of the developed countries, when considering any proposal for import of technology is always desirous of a transfer of technology in full, that is, the technology brought in by a transnational company must cover the full range of production and management processes and not be confined to the assembly of ready-made parts or the manufacturing of dislocated component parts only. On the other hand, the decision of a transnational company on the size and degree of technology to be used is based on its own requirement at any particular point of time and how best an arrangement will meet the overall objectives of its worldwide network. Let me take a case from Malaysian experience. A transnational corporation engaged in the production of electronic goods established a subsidiary company in Malaysia and the agreement stated, inter alia, that there would be a transfer of technology to Malaysia. The agreement further stated that raw materials should be imported from the parent transnational company; finished products had a ready market as they would be bought by the parent company; in consideration for the service rendered by the Malaysian subsidiary company, a service fee would be paid by the parent company on a "bailment and service fee basis"; in consideration for the transfer of

technology, the Malaysian subsidiary company had first to pay a stipulated sum for the first three years of production, secondly, a royalty payment of 2% of the contract revenue and, thirdly, sum fees calculated on the basis of the salaries of the personnel employed by the subsidiary company plus a percentage of such salaries designated as overhead expenses. The case I have cited in essence shows that:

(i) the Malaysian subsidiary company is merely an assembly plant and not engaged in the full production and management of an electronics company; thus the technology gained is limited in its scope to provide any multiplier effect in the country, although it does provide new employment opportunities;

(ii) as it has to import its semi-finished components from its parent company and export its finished goods back to the parent company, the opportunity is not provided for this Malaysian company to look for alternative sources of supply for components or for outlets overseas for export markets so that the company cannot reap maximum returns and benefits--this example thus illustrates my second point on the restriction on the supply of raw materials as well as the fifth point on the restriction of market outlets in other countries;

(iii) the establishment of the subsidiary Malaysian company does not necessarily entail the provision in the country of a net inflow of foreign exchange--the service fee paid by the parent company may be offset by the range of fees charged by the parent company for the technology transfer, the exorbitant salaries of expatriates working in the country, the import of components from the parent company and, of course, the import of machinery and equipment from overseas;

(iv) in so far as the transnational parent company is concerned, the Malaysian subsidiary has provided nothing more than a good source of cheap labour, although, at the same time, enhancing its corporate worldwide network.

9. I do not consider this form of technology transfer to be good enough for a developing country. The company is more of a provider of employment opportunities to labourers in the country than a transferor of technology. Would we call this form of technology transfer a myth or a reality?

10. Although the afore-mentioned Malaysian example does not include any prohibition on transfer, assignment or sub-licensing, it is obvious that the transnational company realized that it was not necessary as there was no room whatsoever available for any transfer of technology elsewhere.

But in other cases where such transfer, assignment or sub-licensing could be effected, appropriate clauses were provided to prohibit these activities. Therefore, whatever the form of technology, if any, it can hardly have lateral expansion for the benefit of larger numbers of the population of developing countries as always aspired to by their respective governments. In the context of regional economic development, such as that of the ASEAN countries, it appears impossible for member countries to exchange technologies with one another if each specific technology has been acquired through joint ventures with transnational companies. Under the circumstances, each country wishing to acquire similar technologies will have to seek fresh agreements with such transnational companies and of course with the same foreign exchange outlays, although they could have been obtained at a much cheaper rate from a member country in the ASEAN organization. What is the prospect for developing countries of developing their own technologies? Will they not be perpetually dependent on technologies of developed countries? And what is the cost that they have to pay? And until when? Forever?

11. Again, in the Malaysian example, I have not shown the implications of the restrictions on the import of raw materials which are normally insisted upon by the transnational companies. This is because of the fact that, in that particular example, the question of the price of the imported components does not arise because the Malaysian company only earns on service fees for assembling the components into finished products. The more common practice of transnational companies is to allow their subsidiaries in developing countries to transact with the parent companies on a "buy and sell basis" whereby prices of raw materials originating from the parent companies and of the finished goods exported to the parent companies are agreed upon from time to time. "Tie-in" clauses contained in agreements such as this may bring about disastrous effects for developing countries as they often mean overpricing of inputs and underpricing of outputs. The transnational company, of course, can bear the losses of its subsidiaries in developing countries because they are made good by the enormous profits of the parent company. In view of the overpricing of inputs imported from the parent companies, production costs are abnormally high so that, even if there is no restriction on alternative export outlets, the subsidiary company cannot effectively compete in the international market. In many cases, the products cannot even compete in the local market, thus making it necessary for the Government to erect a tariff wall. As a result, even ordinary consumers become victims of the irresponsible practices of transnational companies by having to pay higher prices for such goods. Yet, to worsen matters, developing countries offer a wide range of

incentives to lure such foreign corporations to invest in their respective countries hoping for the transfer of technology from the transnational companies. It is not uncommon for some transnational companies to take advantage of the opportunities offered by developing countries by manipulations of various kinds, thus skimming off the cream in the first few years during which the incentives are provided.

12. Let me, therefore, cite a second example from another Malaysian experience. A joint venture was established by a Malaysian firm with a transnational corporation to produce rubber products. Machinery and equipment, as usual, were imported from the country of origin of the parent company. Subsequently, the company went into production and fees of various kinds for technical, management, engineering, as well as legal services, were duly paid and together absorbed a substantial proportion of the expenses of the subsidiary company. Again, the "tie-in" clauses were present whereby products were only permitted to be sold to the foreign partner. After a few years, the whole machinery and equipment broke down. Investigations revealed that the equipment was old, obsolete and had been written off by the foreign partner. But, by the time of discovery, it was too late to take any positive action as the foreign share had already been sold off to the Government. I do not think it necessary for me to analyze this classic example of the so-called "transfer of technology." Suffice it for me to say that the transnational company had been successful in finding a good market for its scrap machinery in order to change to new machines in its parent company.

13. However, as I have touched on the aspect of machinery and equipment, I would also like to mention here that experience in the past has also shown that there has been very little effort made to adapt the imported technology to the environment prevailing in developing countries. This often results in high production costs owing to inefficiencies caused by technologies which were originally designed for large-scale and capital intensive operations and under-utilization of production capacity.

IV. Transfer of Management Know-How

14. Apart from the physical means such as machines and documents, transfer of technology is also commonly practised through persons who dispose of special skills and knowledge. Technology recipient countries, especially developing countries, are appreciative of the fact that, in the initial stages of the operations of a foreign company, the employment of imported

skilled personnel in these companies is important in order to ensure the smooth running of the company as well as to provide training opportunities for local personnel. However, developing countries have often questioned the speed of transfer of the technology to them in view of the prolonged maintenance of these expatriates in such companies. There seems to be an inadequacy or total absence of proper training programmes and facilities for the local staff so that the period of dependence on imported personnel is being prolonged indefinitely. Owing to this uncertainty, some developing countries have used pressure in order to change this position. This is particularly true in the case of key and strategic positions such as those involved in the vital stages of production or management where they are continuously held by foreign staff and no effort is made towards a take-over by local people. Is it not obvious that technology is deliberately being withheld rather than being transferred by such companies? To aggravate the situation further, there have been instances in which some developing countries claim that transnational corporations have transferred some of the best local employees of the recipient countries to their respective head offices or to their other branches in some other countries where they have business operations in order to prevent that staff from taking higher responsibilities in their own country. This is what many countries have referred to as "reverse transfer of technology" or simply "brain drain." In some instances, owing to the attractions of amenities and luxuries in the developed countries, many of the staff originating from developing countries decide not to return to their country of origin.

15. I wish to stress, however, that the record of some transnational corporations in the provision of training and instruction has been good, especially when compared with local firms in similar lines of operations. A comparison of 14 US subsidiaries in the Philippines and in Mexico with similar enterprises shows that the US subsidiaries spend five times as much on the training of their staff as do their local competitors.¹ Similarly, the nationals of Southeast Asian countries have benefited to a major extent from the training provided by Japanese transnational corporations. Yet, there is further dissatisfaction in many developing countries in that the training has been too specialized for the particular operations of a firm and that it is therefore almost impossible for the knowledge to be shared by others to enable the technology to spread to other activities or to fellow developing countries.

¹ Rolf Sutter: Inter-economics, Vol.12, 1974, page 382.

V. Transfer of Research Findings

16. An aspect which I consider to be very important in the transfer of technology is research. It is also common to find distasteful clauses such as non-reciprocity in the exchange of research findings contained in contractual agreements. In many agreements, technology suppliers, i.e. the transnational companies, are not under any obligation to pass on to their subsidiaries in developing countries information about improvements which they have made. A survey made in one ASEAN country, the Philippines, showed that 14 out of 254 agreements examined contained a clause under which the benefits of improvements by the licensee accrued to the licensor.¹ The developing countries are thus deprived of access to the findings of the transnational companies' research and development, to which developing countries have nonetheless contributed through royalties and other payments. On the other hand, transnational companies have insisted that their subsidiary companies inform them of any improvements made in technology. The lack of research facilities is also apparent in the subsidiary companies of transnational companies in developing countries. A survey of US-based companies showed that, of their total expenditure on research and development, less than 10% was spent abroad; of this, less than 10%, or less than 1% of the total, was accounted for by expenditure in developing countries.

VI. Foreign Exchange Costs of Technology Transfer

17. I am now coming to the most elusive hope of developing countries when seeking technology transfer, that is, to save as well as to increase their capacity to earn foreign exchange. As I have also said earlier, technology transfer is always associated with the hope of reducing foreign exchange outflow as the volume of imported products declines. At the same time, if production is sufficiently large, it could be channelled to other countries, thus increasing the capacity of the country to earn foreign exchange. Many developing countries are under the impression that the foreign exchange costs involved are only the royalty payments. In reality, they can be very much more. They may comprise the following:

¹ Report of the UNCTAD Secretariat on "Major Issues Arising from the Transfer of Technology in Developing Countries," page 36 (1974).

(i) Payments for the import of machinery and equipment, the price of which is determined by the transnational company. In all probability, similar machinery and equipment could be obtained at a much lower cost from other sources.

(ii) Remittances made by expatriate personnel to their country of origin--these expatriate staff are normally earning many times more than local staff holding the same position in the subsidiary company.

(iii) Repatriation of profits to shareholders in other countries.

(iv) Amortization and interest payments abroad.

(v) Management charges, licence fees and others, all of which could be quoted at the whim and fancy of the parent company.

18. The evaluation of different balance of payment statistics in 1972 shows as a common feature that the earnings of foreign enterprises in developing countries (oil companies included) were about twice as large as the amount of funds flowing in from outside. A German study gave a ratio of 1.5 to 1 as the relation of profit transfers--including interest and amortization (oil companies excluded)--to new investment.¹ This picture seems to reconcile very well with the balance of payments of developing countries. For example, the Malaysian balance of payments from 1971 to 1975 shows that, in the course of the five years, the total inflow of Corporate Foreign Investments amounted to \$2,496 million while the total outflow in the form of Investment Income of Foreign Investment Companies amounted to \$2,550 million. I have not, however, included net private transfers, which amounted to \$884 million, and what are called "errors and omissions" of \$1,559 million. While it is not accurate to ascribe the entire amounts of these last two items, there is also ground to argue that a sizeable proportion of them could have arisen from recorded and unrecorded transfers of various forms of transnational companies and their staff working in the country. In terms of saving and increasing the foreign exchange capacity of the country by means of international trade, I have found that the balance between imports and exports of selected

¹ Dr. Dietrich Keschull in "Critical Remarks on Multi-national Corporations," Inter-economics, Vol.10, 1972, page 302.

goods such as chemicals, manufactured goods, machinery and transport equipment and miscellaneous manufactured articles recorded an increasing deficit from \$2,190 million in 1970 to more than \$3,500 million in 1975 (or +60%).

19. I have so far illustrated the myth and reality not only in the transfer of technology per se but also in the hopes and aspirations associated by many developing countries with the transfer of technology.

VII. Conclusions and Recommendations

20. The issues involved in the transfer of technology are indeed inexhaustible. The more information one gets the more issues will be identified. I personally have found the subject to be most exciting. Therefore, after having identified some of the pertinent issues, it is also incumbent on me to put forward ideas and suggestions to solve and remedy some, at least, of these problems. In this respect, I wish to draw your attention to a Report by UNCTAD (United Nations Conference on Trade and Development) entitled "Major Issues Arising from the Transfer of Technology to Developing Countries"¹ in which most of the issues and recommendations have already been formulated. The report says:

"Developing countries are becoming increasingly aware of these problems... (comprising the various restrictions on imports, exports, domestic competition, royalties and over-reliance on expatriate personnel), ...but only in a few of them has this awareness found expression in the formulation of policies concerning the import of foreign technology, within the context of national development plans or programmes. Many developing countries have fairly comprehensive laws and regulations governing foreign investment, but similarly comprehensive policies on technology have yet to be formulated in most cases. In the absence of a general policy concerning the transfer of technology, each individual transfer is treated as an isolated event. The impact on the country's development potential is left wholly out of account."

¹ Report of the UNCTAD Secretariat on "Major Issues Arising from the Transfer of Technology in Developing Countries," (1974), page (vii).

The report pointed out the absence of suitable administrative machinery for dealing with these issues. Institutions should be established at national, regional and international levels in order to enable developing countries to secure a fairer deal.

21. Institutional machinery at the national level could undertake the following functions:

- (i) Be responsible for the registration, deposit, review and approval of agreements involving transfer of technology in the public and private sectors.
- (ii) Undertake or assist in the evaluation, negotiation or renegotiation of contracts involving the transfer of technology.
- (iii) Assist domestic enterprises in finding alternative potential suppliers of technology in accordance with the priorities of national development planning.
- (iv) Make arrangements for the training of personnel in staff institutions concerned with the transfer of technology.

In addition, the institution should also undertake the function of creating programmes for the development of local technology as well as reviewing existing industries working on imported technologies. The institution may also be given the power to apply sanctions in the event of technology transfer.

22. At the regional level, efforts may be geared towards:

- (i) regional representation, and
- (ii) regional cooperation.

On representation, developing countries may establish a body of experts, both in the technical and legal fields; such a body may be empowered to scout for the best and most suitable technologies, negotiate on behalf of the developing countries of the particular region, provide facilities for registration, preparation of agreements, review and authorize royalty payments and facilitate exchange of technologies and manufacturing know-how obtained. This, I have been given to understand, is being worked out.

23. As regards regional cooperation--and here I would like to pause to say that the ASEAN Chamber of Commerce and Industry is already making some headway in this direction--it would be most beneficial if a common understanding could be arrived at among the developing countries on the maximum price they are ready to offer for a technology, or an agreement on the maximum terms they will offer to the suppliers. Negotiations may be conducted with various suppliers of the required technology instead of with a sole supplier. The basic principle to follow in this situation is to seek out and negotiate separately with several alternative suppliers of technology. A good bargaining strategy is to continue negotiations with as many as possible even where it is fairly clear that the terms offered by one of them are favourable and will be accepted. There is the prospect of improved terms being offered by some of the suppliers. It must be impressed upon all technology suppliers that they will not be favoured with tax exemptions, lower tariffs and other benefits if any technology transfer has in itself terms which are too burdensome and restrictive.

24. At the international level, the following changes may bring about considerable improvements for developing countries as far as requirements for the application and use of patented inventions are concerned:

(i) the right to apply sanctions against imports (of the patented goods) when it is desirable to have a product manufactured locally;

(ii) the right to export the patented goods to any market;

(iii) better terms to enable the licensees (the local entrepreneurs) to produce patented goods which are competitive in international markets. This may be done by way of reviewing the existing system of royalty payments, and having the grant of licences subjected to the arrangement of a profit-sharing scheme between the patentees and the licensees. This will result in a reduction of production costs, which will enable developing countries to penetrate and compete effectively in the international markets.

25. At this juncture, I am inclined to think of the establishment of an international technology bank in order to effect matters such as the afore-mentioned. The establishment of such a bank would fill the vacuum presently existing in technology transfer at the international level. This authority--it could be a specialized agency under the United Nations or perhaps WIPO itself with extended powers--staffed with experts both in the technology research and

industrial fields, should act correspondingly with the International Development Research Centre.¹ This authority could be vested with rights to:

- (i) collect technologies of existing and expired patents. In this, the authority would be responsible for gathering technical know-how from various patentees with a collateral duty on the part of all member States of the Berne and Paris Conventions on intellectual property to register their patents and technical know-how with the Technology Bank, giving the Bank the prerogative to develop and make modifications to existing technologies, as well as transmit updated and appropriate technologies suitable for the recipient countries;
- (ii) provide technical consultancy as well as economic consultancy. Technical consultancy would consist of advice on organization, planning of product development, introduction of modified or new production processes, and selection of machines and mechanical equipment. Economic consultancy would consist of advice on buying, production, marketing and financing.

The International Technology Bank could be instrumental in discouraging the malpractices of supplier countries such as transmitting outdated technologies and obsolete machinery and equipment.

26. The Bank would then be able to effect the transfer of research and development facilities. Such a transfer from the developed to the developing countries would be especially useful in that new technological processes could be elaborated in the physical and social conditions in which

¹ The Centre was established in 1970 by an Act of the Canadian Parliament and is governed by an International Board of Governors from 10 countries besides Canada, six of which are developing countries. It undertakes programmes which are of a regional nature, providing technical information for developing countries and interchange of information between members. Further, nationals in the various countries are being trained as field men to assist in the defining of inquiries and applications for information received.

they are ultimately to operate. Moreover, if local scientists are trained and then employed and cooperation is established with local research institutions, much preliminary work can be done which will speed up the research programme.

27. Developing countries need an increasing amount of technology in order to accelerate their development. In this regard, they will have to continue to rely on private foreign investments, at least for some time. However, it would be wrong to assume that investors, whose objective is the growth of their enterprises, will completely adopt the developing countries' development targets. Condemnation of the transnational companies will not bring any benefit, but to extol them would be as wrong. What is needed is for them to be more conscious of the environment in the respective host countries. In the words of Dietrich Kobschull of the Hamburg Institute for International Economics, the transnational corporations will have to reorientate their outlook by giving greater regard and consideration for national objectives which include the priorities of development planning; long-term commitments by the international enterprises; voluntary self-restraint to the earning of "reasonable" profits; a high reinvestment ratio and limited transfer-back of resources; development of highly competitive efficient technologies; cooperation with indigenous enterprises; priority for domestic accessory suppliers and limitation of imports; emphasis on exports; research and development activities in the host country; cession on favourable terms of patents, licences and technical know-how; curtailment of the number of expatriate staff (among operatives, in the offices and in management); and training of indigenous personnel for executive positions.

INTELLECTUAL PROPERTY PROTECTION:
PROMOTER OR INHIBITOR OF TECHNOLOGICAL DEVELOPMENT
AND INTERNATIONAL TRADE?

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In this assembly of distinguished experts on intellectual property rights and on the exigencies of developing countries, to take the floor in a discussion on the importance of the patent system to such countries without possessing either formal expertise or official status that would lend appropriate weight to one's words may appear exceedingly audacious.

However, I am working on the assumption that this Symposium may benefit also from contributions by representatives of international industry and trade who, as part and parcel of their occupation, have frequently to estimate the possible implication of the existence or the lack of intellectual property protection arrangements in a certain market place when considering commercial or technical strategies in the international context.

Since the views I am advocating are indeed my own personal ones and have to a large extent been formed and developed in my employment over a long stretch of years with an internationally operating private enterprise of comparatively modest size and with its home base in a country of equal modesty as to population, area and political influence, they could not and should not be construed as reflecting any ulterior motives, whether commercial or political.

The topic to be discussed in this Symposium is indeed a very vital component of a vastly larger complex resulting from the unfortunate fact that some members of the large family of countries throughout the world are, for various reasons, lagging considerably far behind in technological development compared with the rest of the family.

If no rational measures are taken--and taken fast--those countries lagging behind will inevitably experience a continued widening of the technological gap. In turn, for

many, if not most of them, this will unduly prolong their present unfavorable situation with regard to the export of raw materials and the import of finished products in spite of further assets in manpower and human intellect.

The situation as such is in no way unfamiliar to any country if viewed only from the historical perspective. All present so-called "developed" countries have at different times gone through a similar phase in their evolution. Thus, my own country on the northern borderlines of Europe has, up to modern times, been a typical raw material producing country with very little domestic processing, if any at all, of its raw material resources. As time went by, the situation grew precarious, leading to a realization of the need for technological processing knowledge that was only available abroad.

Use was made of both of the only two expedients of that time, namely, sending one's own people abroad for study and on-the-spot training and--above all--engaging foreign craftsmen and experts. In my country today, a substantial part of the population consists of descendants of those skilled foreigners who greatly contributed towards starting the country on the road to development.

Also of certain interest in the present context is the fact that the spin-off of the endeavors to establish a domestic manufacturing industry was the embryonic origin of a primitive feudal system for intellectual property protection that preceded today's patent system.

Other present-day industrialized countries have certainly had similar experiences during their evolution process.

As is the case in numerous other respects, it is thus again an easily ascertainable fact that the countries of the world are in no way basically different from each other with regard to the possibilities of technological development. Rather than being a basic one, any difference is more a matter of a time delay due to extrinsic conditions and definitely not one of intellectual inferiority. Besides, how could one possibly with any hope of success try to prove a present technologically developed country's intellectual superiority over a so-called "developing" country while at the same time knowing that frequently the fundamental knowledge and science indispensable for any technological progress originated in earlier cultures of that developing country? No: elemental catastrophes, wars, colonialism, etc., would in my opinion offer the most probable explanation for the temporary lag in technological development.

To reduce and ultimately eliminate this time lag is of primary concern to all of us. The solution is, of course, to suggest adequate ways and means to promote the transfer of the required technological know-how from the developed to the developing countries. The crucial question indeed remains, however, the terms to be applied.

My opinion on this question is far from unique but definitely straightforward. The most natural and efficient way of transferring both general and specialized technological know-how is one based on reciprocity, where the parties in fact have interchangeable receiver and donor roles and both benefit from the transaction. I therefore feel that transfer does call for an equitable consideration.

I am, of course, fully aware of the sea of controversial attitudes my opinion unfortunately may create. However, I maintain that all of us, individuals and nations alike, seem to accept the psychological fulfillment obtainable from satisfying our own needs at our own expense rather than having to resort to charity or even theft. In this case, the obvious reason for different opinions would therefore be traceable back to different definitions of the nature and terms of the equitable consideration in question. In simple terms, two schools of thought are apparent here: the bilateral and the multilateral.

For various reasons, the adherents of the bilateral school plead that the most efficient technological recovery is obtainable through very close and extensive cooperation with one technologically developed country or one bloc of countries of that kind. The developing country in question will, in such an arrangement, frequently have to accept that the consideration demanded or resulting will be of a political or military-strategical nature. Apart from the possible political implication, there is a definite risk of a one-sided specialization of development not compatible with the general idea of development.

The multilateral school, to which I personally subscribe, does not apply any such restrictions either to the scope or to the quality of the technological development intended. In principle, the required know-how could be acquired wherever available. Not even bilateral arrangements between countries are excluded, provided they do not per se interfere with or counteract the multilateral concept.

Furthermore, the patent system lends itself excellently to application within the framework of the multilateral concept since a patent by definition constitutes an agreement

on possible transfer of a certain kind of technological knowledge and a patent system offers definite possibilities for adequate working provisions and for useful remuneration principles.

It goes without saying that most international marketing enterprises with products based on technical development of their own embrace the multilateral idea. This is particularly true of those enterprises which operate from countries of little or no political influence.

Some markets could be inaccessible to products of such an enterprise unless local or at least less remote production facilities are available. When choosing the optimal country for production, an important factor could usually be whether the country considered offers intellectual property protection and is non-exclusive in its international trade relations. Other equally important factors are, of course, the availability of raw materials, manpower, energy, etc.

Depending on the market structure of the country in question from a commercial and technical point of view, the production facilities could be realized either by license agreements with an existing local setup or by establishing a new production unit. In both cases, joint venture or similar participation arrangements with local interests could be employed.

This is a more or less typical model pattern that I personally easily recognize from my professional experience as a patent house counsel and in managerial capacities within research and development, technical service, production, and marketing with a company whose products appear in some 75 countries.

The procedure as such has long been and still is widely used as a marketing vehicle in trade relations between technologically developed countries but is in my opinion equally, or even more advantageously, applicable to trade with developing countries though at least certain versions of such application, particularly the case which involves a wholly foreign-owned subsidiary operation and intellectual property protection, appear to be objectionable in some quarters.

I appreciate the reluctance reflected by such an attitude but cannot dismiss the suspicion from my mind that the attitude as such derives from ignorance of industrial conditions and realities or--even worse--from a misapplied assertion of prestige. The relatively short, more or less introductory-type protection offered by a patent system should

be regarded only as an incentive justifying the investment. At least for practical reasons, the establishment proper of the exploitation operation does not, and should not, imply moving a complete staff and crew from abroad to the country of exploitation and creating foreign industry enclaves isolated from the rest of the host country, sharing neither their lives nor their industrial know-how. Only the start-up period could call for any sizeable number of staff and crew from abroad, mainly for training the locally employed people to take over the operation eventually. After the start-up period very few, if any, key staff will stay for a longer period to facilitate two-way communication of policies and additional know-how.

Since an exploitation operation of this kind, though initially based on working specialized know-how, will necessarily comprise utilizing all means, techniques and practices of similar installations elsewhere, the locally employed people will also acquire a vast general commercial and technical knowledge.

Experience has shown that the learning period is amazingly short irrespective of the development level of the country in question. The most striking difficulties relate usually to linguistic problems and different cultural backgrounds, where the former are more easily coped with provided the latter do not tend to introduce semantic misconstructions.

In addition to the initial training of the people employed and following the practice of many enterprises in developed countries, the local exploitation installation may offer further vocational and professional training either locally or abroad.

History proves without doubt how fast skill multiplies and propagates. In today's world, with its manifold means of rapid communication, it is to be expected that in many cases an exploitation unit will serve as a nucleus from which general and specialized knowledge and skill will spread farther and farther into the host society, creating other similar nuclei in an accelerating evolution.

All development, irrespective of the field, has always been universally international.

Somewhere on the globe, an impulse towards a certain development was triggered. The development started and rolled on irresistibly not only where it originated but beyond geographical borders. On its way it gave birth to

other developments propagating in the same manner and, in turn, triggering similar chain reactions. The propagation was always multidirectional and the larger the number of parties involved the more fertile the interaction between them.

This pattern has not at all been exclusively typical of technological development alone but in fact has been characteristic of all cultural manifestations in the world, e.g., conceptions of religion, political opinions, music styles, etc., although it is often less difficult to keep track of technological developments since the documentation there is better.

Wherever a natural development trend has been artificially and forcibly checked for any extended period of time, it has caused various repercussions, even turning evolution into revolution and cooperation into opposition. Eventually the trend discontinuity has ceased and the evolutionary forces have again taken over.

The patent system, when applied in a truly international sense, could indeed be universally instrumental in promoting the natural global development of technology and trade, thereby first of all closing any discontinuity gap that unfortunately has been imposed on certain areas for too extended a period of time.

All suspicions that the patent system one-sidedly favors only those countries at present leading in technological development and dominating trade, and that it should therefore be regarded rather as an extension of colonialism in a new disguise, may be understandable but should be dismissed as unrealistic prejudice. The system is simply a vehicle for the transfer of technical knowledge between two parties without embarrassment to either of them.

On the other hand, it should be noted that the patent system as such should never be the end but the means. Since, in itself, it is a vehicle for knowledge, its efficiency and usefulness will increase with the rising level of education of the society in which it is incorporated.

To conclude: intellectual property protection properly adopted and adapted is definitely a promoter and not an inhibitor of technological development and trade.

FOREIGN INVESTMENT IN THE INDUSTRIALIZATION OF SRI LANKA

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Foreign capital has played a significant role in the economic development of Sri Lanka for a longer period of time than in several other neighbouring South East Asian countries. This was especially true of the pre-Second World War period when economic growth in Sri Lanka was very largely dependent on foreign capital and enterprise. Since independence in 1948, however, the role of foreign investment has been less important and from 1948 to 1960, from the point of view of local and foreign investment, it was a period of relative stagnation. It was private foreign investment that helped to open up the plantations, the most valuable economic asset in the country today. The first plantation investments were in coffee in the eighteen-forties. After 1880, when coffee had lost its importance as a commercial crop, foreign investment took place on a large scale in tea and rubber and to a lesser extent in coconut. Sri Lanka's economic prosperity spread over the preceding 75 years had been largely due to the adventurous spirit of the foreigners who pioneered the plantations in relatively inhospitable terrain in the hill country.

Foreign Investment in Plantations

Before a review is attempted of the role of foreign investment in Sri Lanka in the post-Second World War period, some reference to the importance of foreign investment in economic growth in the period before 1939 would be useful. The tea and rubber industries, both of which involve fairly simple manufacturing processes, owe their origin and development to the initiative of expatriates and the economy of Sri Lanka progressed in the pre-Second World War period mainly thanks to foreign capital and entrepreneurship. When we speak of foreign investment, this could come either as private capital or portfolio investments or in the form of private entrepreneurship with limited capital. The kind of

foreign investment that took place in Sri Lanka in the period before 1939 fell essentially into this latter category.

People in Sri Lanka have been critical about the form of investment made in the plantations. The charge is often made that little or no foreign capital in the form of remittances flowed in and what came in was really entrepreneurship and management skills rather than foreign money. To some extent, this is true, but what is significant is that especially during the period 1890 to 1930 the level of investment in Sri Lanka would have been negligible or extremely low had foreign enterprise not opened up the plantations. A good part of the capital for the plantations was found locally and government land was freely available either in the form of leases or outright grants at exceedingly low prices. Labour was imported from India, and, since wage rates were low, the expenditure on labour, which was the principal factor of production, was small. The technology used in the plantations was labour intensive and as a result low cost. Small factories with a few pieces of machinery were used in manufacturing. The availability of a large cheap labour force enabled the opening up of more than 1 million acres of tea and rubber lands in about 30 years.

The foreign banks in Sri Lanka also participated to some extent in the development of the plantations by financing exports and by providing advances to the Agency Houses, which in turn channelled this money into the estates as working capital. At first, the foreign capital that flowed in to the plantations was largely in the form of management skills and initiative on the part of the Europeans who arrived in this Island to open up plantations. Investment in the portfolios of newly floated tea and rubber companies seems to have been made mainly after large extents of land were brought under cultivation. Subsequent portfolio investments largely helped to expand the land area under plantation crops. These plantations were able to generate foreign exchange earnings very rapidly because almost the entire output of tea and rubber was exported. The plantations have proved to be the principal agency in generating foreign resources for the economic and infrastructure development of the country.

Foreign investment in the plantations had largely ceased by the time the Second World War ended and before 1939 profits and dividends tended to flow out freely because exchange control was non-existent. Between 1939 and 1960, foreign investment in Sri Lanka had come to a standstill although on several occasions the Government had issued statements welcoming foreign capital because it realized the

country was desperately short of technical know-how and management skills to promote development.

First Statement on Foreign Investment

One of the first statements on foreign investment policy was made in February 1954 by the then Prime Minister, Sir John Kotalawela, when he declared open the 10th Session of the ECAFE in Colombo. He stated that Sri Lanka would welcome foreign capital and enterprise as long as no political strings were attached, and an assurance was given that profits and dividends would be freely remittable. He also went on to say that no impediments would be placed on the repatriation of both the original capital and also any capital that had appreciated in value. He emphasized: "We cannot, of course, expect foreign capital to flow freely into this country unless investors are assured that they can have control and management over their investments. Accordingly we recommend that such foreign nationals as are necessary for the efficient management and operation of foreign-owned undertakings should be permitted to take up residence in Ceylon. Since the object of all development is to expand the scope of employment for nationals of this country, it is not unreasonable to expect foreign investors to provide opportunities for training of Ceylonese from the very beginning."

The First White Paper of 1955

Further policy statements were made on foreign investment in the Ten-Year Plan in 1958 and in 1963. More specifically, foreign investment policy has been elaborated and embodied in three White Papers released in 1955, 1966 and 1972. The three White Papers were issued when new Governments came into power and although there were divergencies in the economic policies of the Governments that came to power in 1965 and 1970, both recognized that foreign investment was essential for development. In the first White Paper, issued in 1955, the Finance Minister stated that the Ceylon Government believed that there was much scope for investment for private foreign capital in Ceylon in a way which would serve the mutual interest of both the foreign investor and the people of Ceylon. The Paper also stressed "that one of the obstructions to the inflow of foreign capital is a lack of certainty in the mind of the foreign investor about official policy in respect of certain specific matters. These matters usually include the following: the question of partnership between foreign and local capital, the employment of local nationals, exchange restrictions on the movement of funds, taxation, allocation of

raw materials and labour and the problem of future nationalization. There is no specialized law in Ceylon which covers all these aspects and which is solely designed to regulate the inflow of foreign capital. Instead the Government has adopted a liberal and flexible policy."

This White Paper laid down the terms and conditions of partnership between foreign and local capital, the employment of Ceylonese nationals, and, in regard to exchange control, the foreign investor was assured that profits, dividends and interest would be freely remittable. In the field of taxation, foreign concerns were to be treated on terms of equality with local enterprise. It was also stated that the Government policy would be to ensure that once a foreign investor has been permitted in Ceylon he would not be subject to discriminatory treatment.

The White Paper of 1966

The second White Paper on Government Policy on Private Foreign Investment, issued in 1966, indicated that a large and steady flow of capital, technology and managerial skills was vital for the country's development effort and that the level of domestic savings was inadequate to meet the full capital requirements of the development programme. It also stressed that the foreign capital helped to increase the import capacity and to relieve strains on the balance of payments. In 1964, the previous Government had been compelled for balance of payments reasons to apply a moratorium on the payments of dividends, interest and profits. The White Paper stated that the present policy was to relax the moratorium as the balance of payments improved and that the moratorium would not apply to approved foreign investments. It indicated that profits, dividends and interest accruing to foreign investors would be freely remittable. Investors were to be permitted to bring in foreign managerial and technical personnel; but Ceylonese should be progressively trained and employed. Remittances for the maintenance of families of foreign personnel employed were to be allowed, and the savings of foreign personnel were also transmittable abroad. In addition, reasonable royalty payments and technical fees were to be permitted. It was also stated that foreign investors were secure from expropriation and any form of discriminatory treatment and the Government had no intention of nationalizing any of the private undertakings. If, however, this was to become necessary for an overriding consideration in the public interest, "prompt, effective and adequate payments will be made to compensate investors for the loss."

The White Paper of 1972

In June 1972, the third White Paper on Private Foreign Investment was issued because the Government considered that it had become necessary to revise the statement issued in March 1966 in order "to reflect policies of the present Government and to incorporate changes that have been effected in the taxation, exchange control practices, regulations affecting foreign investment and the operation of the Foreign Exchange Entitlement Certificate scheme." In this Paper, too, the Government was of the view that private foreign investment had an important role to play in the economic development of the country. The Government "accordingly invited foreign investment from all countries in certain specified fields and on terms which are considered appropriate in the context of the Government's general economic policy." The Paper specifically mentioned the tourist industry, where proposals for foreign investment would be welcome. Another area was the fisheries sector, where it was said that foreign investment in collaboration with State enterprise would be considered. In the industrial sector, foreign investment applications would be considered for participation in State enterprise or in collaboration with private enterprise. The terms of this White Paper were a little more restrictive. As in the White Paper issued in 1966, it did not give an undertaking that the Government had no intention of nationalizing any undertaking; it merely "assumed complete security of his investment." It was specifically stated that certain areas were reserved for Government investment and that industries not reserved for the State sector were open for development by private enterprise. "Proposals for investment in the private sector whether they were local or foreign would be considered only if they were in conformity with the Government's Five-Year Plan and if they showed adequate yield on a social cost benefit analysis." Investment proposals which were designed for greater use of indigenous raw materials or for production for export and which were located in the less developed areas of the country, as well as those that used an intermediate or labour-intensive technology, were welcome. It also stated that private sector foreign investment would be considered for approval if in addition to the conditions already mentioned the following were met:

- (a) if the technical skill necessary for the industry was not locally available;
- (b) if the cost of imported machinery was high and the capital contribution of the foreign investor would help to relieve the burden on Sri Lanka's foreign exchange resources;

- (c) if the greater part of the output was to be exported.

The Government indicated that it proposed to establish an export processing zone using the facilities of the natural harbour in Trincomalee and that foreign investment in that zone would be welcome for all types of export processing industries, particularly those which would benefit from the natural advantages of the Trincomalee harbour. The Paper also assured that in the event of the nationalization of any property owned by the foreign investor full and prompt compensation would be paid. Investment guarantee agreements had been signed with the USA and the Federal Republic of Germany and those agreements had established clearly the definite obligations of both contracting parties. It was stated that the Government was prepared to negotiate similar agreements with other interested countries. The White Paper spelled out in greater detail than on preceding occasions the taxation and other incentives for tourist industry undertakings.

Import Restrictions and Foreign Investment

It will be seen that foreign direct investment in Sri Lanka has been subject to regulations right from independence in 1948. The restrictive system in Sri Lanka emerged with the introduction of exchange control in 1939 and from that time onwards the quantum of restrictions has grown and has progressively worsened since 1959. From the provisions in the successive White Papers it will be seen that policy has been to identify areas open for foreign investment and to spell out the facilities, inducements and concessions offered to foreign investors. Before 1950, there were a few large foreign investors, such as the Ceylon Tobacco Company, Lever Brothers, Ceylon Oxygen Limited and the Colombo Gas and Water Company, but their number was, in general, very small. The bulk of the foreign investments which remain in the country today were made after 1959 and in the following ten-year period. This foreign investment activity in Sri Lanka coincided largely with the years of acute foreign exchange difficulties which began around 1959. The period 1959 to 1960 is significant because, mainly as a result of the acute shortage of foreign exchange and the tendency for the balance of payments problems which had emerged two years earlier to get worse, the Government clamped down heavily on imports by using direct quantitative restrictions. In its new import policy, the axe first of all fell on manufactured imports. Before 1959, manufactured imports came into the country and import licences were issued mainly with the object of diverting the trade into the hands of Ceylonese

nationals. A number of multinational enterprises that had traditionally provided Sri Lanka's market with a wide range of manufactured consumer goods found their products shut off from the domestic market. These firms reacted to the situation by making proposals to manufacture in Sri Lanka goods that had been subject to quantitative restrictions. The nature of investment proposals made between 1960 and 1970 clearly shows that there was a very close connection between quantitative restrictions and the inflow of foreign investment. There is the classic case of the British-owned Chloride Electrical Storage Company producing Exide and Dagenite Automotive Batteries, which set up a subsidiary known as the British Batteries (Overseas), in collaboration with Joseph Lucas Limited, specifically to establish battery-making plant in the countries where import restrictions had cut off markets. The first project set up by this newly founded company for overseas manufacture was in Sri Lanka.

More than 60% of the investment proposals that were made between the years 1960 to 1970 were earmarked by overseas manufacturers to protect an existing market. This is also clearly evident in two areas where the axe on imports had fallen very heavily; these were drugs and pharmaceuticals, and cosmetics. Before 1960, about 60% of the drugs and pharmaceuticals and 90% of the cosmetics came from the United Kingdom. These products were subject to severe import restrictions in 1960-61. Soon after, proposals came from several manufacturing firms in the United Kingdom for the production in Sri Lanka of a wide range of drugs, pharmaceuticals and cosmetics. In the pharmaceuticals trade, Glaxo, Reckitt & Coleman, Pfizer Dumex and several others set up plants locally with the object of maintaining their share of the market after the introduction of the import restrictions. The same was true of the sewing machine industry. Before 1960, the Singer Company controlled about 80% of the sewing machine market in the country and within 2 to 3 years of restrictions in imports the company opened up a manufacturing plant in Sri Lanka and by this means it was able to retain practically the same percentage share in a growing market. In addition, two other foreign firms manufacturing sewing machines with a considerably smaller share of the market also established plants in the country in collaboration with local enterprise.

Several foreign firms whose market share was relatively small also took the opportunity of increasing their share of the local market by collaborating with local enterprise after import restrictions had cut off markets. There was the case of a Japanese firm of electric bulb manufacturers which had practically no share in the market but collaborated with

Ceylon Bulbs and Electricals to gain a large share in a market which had been practically shut off from their point of view. In the case of ceiling and table fans, for instance, Ceylonese firms collaborated with Indian, Japanese and Hongkong firms to produce less-well-known makes of fans, while several popular British makes practically went off the market within 7 years of the introduction of quantitative restrictions on imports. Proposals for manufacture with foreign collaboration or assistance of more than 150 products were presented. Up to 1966, the terms on which foreign investment took place were determined largely by the provisions in the White Paper on Foreign Investment issued in 1955.

In 1966, after the Government issued a fresh White Paper on foreign investment, a Foreign Investment Approvals Committee was set up. In April 1966, a circular was issued to all Ministries stating that private foreign investment proposals would have to be forwarded to the Ministry of Planning and Economic Affairs to be considered by the Foreign Investment Approvals Committee. Investment of foreign capital as well as payments for the use of patents, trade marks and technical service fees also fell within the purview of this Committee. New foreign investment was defined to include the investment of foreign funds which would have been remittable if not for the moratorium on remittances of profits, interest and dividends which had been introduced in 1964. These funds would qualify for the full facilities afforded by the Government White Paper of March 1966, but not included under this proviso was the investment of blocked funds. The Committee functioned in an advisory capacity and submitted quarterly reports to the Cabinet. The Permanent Secretary to the Ministry of Planning and Economic Affairs was empowered to consider appeals against the decisions of the Committee.

The Foreign Investment Approvals Committee at the outset had no criteria for the evaluation of investment proposals or to guide it in its decisions. It was generally believed that the policy had already been laid down in the White Paper of 1966, but the contents of the White Paper were indeed very general and did not provide adequate criteria for the evaluation and approval of the foreign projects. The Secretary to the Ministry of Planning, who outlined the Government's current policy on foreign investment to the Committee, stated that foreign investment was influenced by the following factors:

- (a) the basic shortage of foreign exchange, since the foreign exchange available for financing industries was very small;

- (b) one way to fill the foreign exchange gap was to encourage the inflow of foreign capital;
- (c) where there was scope for increase in production in relation to demand, such increased production required additional capacity, and efforts should be made to make available foreign capital for this purpose;
- (d) where established enterprises required additional capital for expansion, such enterprises should be encouraged to seek foreign collaboration as a means of obtaining the required capital;
- (e) while collaboration between local and private capital would generally be preferred, there was no objection, in principle, to the establishment of enterprises wholly owned by foreign interests; in case of collaboration there need not be rigid adherence to any foreign to local capital ratio.

It was also stated that the general policy of the Government was to ensure that there would be an adequate degree of competition; if one or two firms controlled the total supply of a product, new firms should be allowed to come in.

Between 1966 and 1970, the Foreign Investment Approvals Committee dealt with more than 150 applications for foreign investment or for foreign collaboration with local enterprise. Ultimately only about 50% were approved by the Government because in several instances the terms on which the investments were proposed were not advantageous to the country. Some of the collaborators with local enterprise were large multinational corporations based in the United Kingdom, Europe and Japan. Among the matters dealt with by the Committee were arrangements for foreign technical assistance of different kinds and payments for such services. The payments for technical services were determined on an individual basis; they were either geared to a percentage of the net invoice value of total sales, a flat rate of payment or a percentage of turnover or of total sales. Foreign companies which had been operating in Sri Lanka for a relatively long time, such as the Ceylon Oxygen Company, Ceylon Tobacco Company, Lever Brothers, and the Bata Shoe Company, came before the Committee with applications relating to the

remittance of fees for technical services, royalties and other services rendered by the parent firms. The payment of technical service fees related mainly to the use of patented processes, the manufacture of patented products, and trade marks and brand names. In Sri Lanka the domestic consumer identified the quality of a product with a well-known brand name, and products without that name are considered to be inferior even today. The Government had, in principle, to make provision for the manufacture of branded products and this gave rise to increasing royalty payments.

The Patent Law

The heavy technical service fee payments and royalty payments were due in part to a deficient patent law in Sri Lanka. In a developing country, the patent laws should directly contribute to encouraging, developing and fostering individual inventions and innovations. A poor country progresses rapidly only if scientific knowledge and technology from the developed countries can be harnessed freely at little cost. From the standpoint of developing countries, the patenting of products of advanced industrialized countries has created interests which have led to monopolies. As a result, the poorer countries have to pay out annually large sums of money in the form of royalties which permit them to make use of relatively simple technologies and manufacturing processes. Even minor technical processes have been patented and the developing countries have had to incur considerable expenses in obtaining them. In a developing country like ours, the whole question of granting patent rights for innovations, relatively simple processes and technologies needs to be examined because this is likely to retard the industrial progress of the country.

Sri Lanka's Patent Ordinance was promulgated as far back as 1906, in the heyday of British rule. It was superficially amended twice, in 1945 and 1949, but the law remained substantially the same. Patent laws were introduced in the colonies primarily with the object of safeguarding the interests of manufacturers in the home country. To a large extent these laws helped to discriminate against the establishment of even very simple manufacturing industries in the colonies. Under the prevailing law in Sri Lanka, foreign patents automatically became a patent in Ceylon as well and no local manufacturing concern could produce articles without paying high royalty fees. In Japan, patents were not granted for foreign inventions unless they were of a highly technical nature. It was this policy that enabled Japan to achieve a high level of industrialization in a short period of time.

Sections 46 and 48 of the existing Patent Law deal with the grant of patent rights to British and foreign inventors. Under Section 48, the holder of a patent right in Great Britain has to be granted the same right in Ceylon. There is no obligation on the part of the patentee to set up a plant in Ceylon and to produce an article. The Patent Law ensures that the entire market is reserved for foreign interests and local industrialists are prevented from producing identical products. In view of this there is now a need to amend the Law. Applications made by foreign interests should be considered on their individual merits and the Government should have the discretion to grant or refuse a patent right. Patents should be granted only where processes are of a highly technical nature. There should also be provision that no patents should be granted if they are not used in Ceylon and if they are likely to impede the development of the industry in the country. In patenting processes, the economic development of the country should be the overriding consideration.

At present, applications for trade marks are gazetted for objections and they are granted only after hearing the applicant and the objector. In the case of patents, however, the patents are published in the Gazette without prior notification to other industrialists. Any industrialist who is affected by the grant of a patent has to take action in a court of law to revoke the patent. This is an expensive process and it would be advantageous to follow the procedure adopted for trade marks in respect of patents as well. Between 1963 and 1967, the highest number of patents were taken out by the Bata Shoe Company. In this same period, during which a large number of industries were set up with foreign collaboration, as many as 1,374, or 60%, of the total number of patents were granted to foreign companies. The ease with which a foreign firm can obtain a patent in Sri Lanka and the exorbitant legal costs that have to be incurred in contesting patents tend to kill local initiative and militate against a further lessening of dependence on the foreign collaborator.

It may be useful to indicate the salient features of the few investment proposals that came before the Committee in this period. In the case of one firm, Lambretta Ceylon Limited, which was concerned with the manufacture of scooters in collaboration with an Italian parent company, foreign collaboration took the form of provision of capital, representation on the Board of Directors, technical assistance and loan of technical personnel. In regard to the locally manufactured component parts, the manufacturer had to pay the foreign collaborator a tax of 5% of the export

price. The foreign personnel were on a service contract of three years' duration. In the case of Singer Industries (Ceylon) Limited, the initial foreign capital was 1 million Rupees and after 1966 it was increased to 2 million Rupees, the increased amount being used to finance the import of machinery from their principals in the United States. In the case of other industries concerned with the manufacture of artificial leather cloth, paint and distemper brushes, galvanized sheets and barbed wire, the foreign collaborators participated in the project by providing machinery to a value equivalent to their equity participation.

In 1966, the Ceylon National Chamber of Industries took objection to certain aspects of the foreign investment policy. It pointed out that foreign investment, in fact, should supplement local efforts and should not compete with local industry. It suggested that foreign investment should confine itself to large-scale and basic industries for which local industrialists had no finance and technical know-how. The Chamber pointed out that shipping, ship building, tourism, deep sea fishing, canning and processing fish, fishing and food production for export were suitable areas. They emphasized that there was no need for investment in industries where adequate capital had been put up by local industrialists. They stated that foreign firms were in the habit of buying their raw materials from agents or branches from their mother country and in this process they would not buy from the cheapest source. They quoted the case of India, where joint enterprises had supplied second-hand, reconditioned obsolete machinery at increased prices. In the case of foreign firms operating in Sri Lanka, research and development is largely centralized in the parent companies. Hardly any foreign firms operating in Sri Lanka have undertaken research and product development independently. In 1970, only some 4 out of 35 foreign firms operating in the country were found to spend anything on local research and even here such work was limited to product orientation and quality control. Most manufacturers have maintained that the limited size of the market tends to discourage research and it is far more economical to have the research done in their laboratories overseas, which are better equipped.

Repatriation of Foreign Capital through Dividends

One unsalutary feature of foreign investment in industry has been the declaration of very high dividends and the tendency over a period of from two to three years of the investment to repatriate the original capital outlay. In the case of a synthetic textile manufacturer, the foreign investment from Japan was 600,000 Rupees out of a total investment

of 5 million Rupees; in 1966, the foreign dividend was 112,500 Rupees, in 1967 it was 300,000 Rupees and in 1968 it was 525,000. Thus in 3 years the foreign investor had taken away 937,000 Rupees, or 150% of his investment. In the case of the manufacture of kerosene cookers, the foreign share was 400,000 Rupees out of a total investment of 1 million Rupees; in 1966, the foreign dividend of 250,000 Rupees was repatriated, followed by 400,000 Rupees in 1967. Thus in two years a sum of 650,000 Rupees, or more than 150% of the initial sum invested, had been taken away by the investor from Hongkong. In the case of a British pharmaceutical manufacturer in Sri Lanka with a total foreign investment of 3.2 million Rupees, the total dividends were repatriated. Between 1965 and 1968, that is, in 4 years, this firm had remitted abroad a sum of 3.5 million Rupees as dividends. From this it is evident that foreign investment of the kind that had taken place had not fulfilled the objectives laid down in the earlier policy statements and White Papers. They had made no contribution to help the foreign exchange situation by increasing inward remittances. Furthermore, in the three examples quoted here, the synthetic mill was provided with technical and plant management know-how which is not difficult to procure from several alternative sources--at a time when Sri Lanka had little or no knowledge of these aspects. In the case of the pharmaceutical firm, its operations were relatively simple and consisted of tableting, tonic making and packaging, but because it enjoyed a non-competitive market its profits were high during the first five years, where there was a tax holiday. As for the kerosene cookers, the technology may have been obtained even without foreign collaboration because the kerosene cooker is a very simple domestic appliance to manufacture. Several smaller units were able to make the same product without foreign collaboration.

A good many of the problems in industry, such as the declaration of very high dividends, arose out of the liberal policy of investment approvals for both local and foreign industry that prevailed before 1965, when hardly any machinery had been set up for evaluation and appraisal.

Proposed Foreign Investment Law

The Finance Minister in his Budget Speech for 1976 proposed the introduction in the coming year of a foreign investment law. He stated that the country required an infusion of foreign capital to help to overcome the unemployment problem, to import new skills, to develop new projects and to provide management consultancy services. He said:

"We must have sufficient confidence in ourselves to be able to control the area of activity of any foreign enterprise so as to ensure our national integrity and free exercise of sovereignty." The proposed Foreign Investment Law was to give legal form to the provisions contained in the White Paper on Foreign Investment of 1972. The Minister also promised to bring in legislation to set up a Foreign Investment Authority. He emphasized that all new foreign investments should be export-oriented and that that was the principal objective of the proposed legislation.

THE IMPORTANCE OF PATENTS IN DEVELOPING COUNTRIES FOR
THE ENCOURAGEMENT OF INVENTIVENESS AND
INDUSTRIAL RESEARCH AND DEVELOPMENT

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It is a great honor and pleasure for me to be invited here to this Symposium and to have an opportunity to talk to you about the importance of the patent system, especially the importance of patents for the encouragement of inventiveness and industrial research and development.

It is about one century ago that Japan adopted its governmental policy of industrialization. Since then, the history of Japan's industrialization has proceeded along with its patent system.

I should therefore like to review the history of Japan's industrialization in order to show how important the role of our patent system has been in the promotion of research and development during the course of Japan's industrialization.

In the year 1868, Japan finally decided to give up its national isolation policy, which had lasted quite a long time. Until then, Japan's policy had been directed to the maintenance of the status quo, that is, severe maintenance of caste, no freedom of job selection and no freedom of change of residence. This 200-years-of-isolation policy broke off international relations and prevented the export of goods to world markets and the introduction of new technologies from abroad, among other things.

The new Government established in 1868 adopted a variety of policies for modernizing Japan. The main policies included a review of the legal system, reconsideration of the economic system and promotion of industry.

Among those policies, a very important one was the adoption of the patent system. The prolonged national isolation

policy had made industrial technologies out of date and had stifled the people's will to inventiveness. Therefore, to promote industries and to attain rapid industrial progress, the introduction of advanced technological knowledge from abroad and practice of those technologies within the State were needed. And, at the same time, encouragement of the people's inventiveness and promotion of research and development were earnestly desired for the improvement and further development of those technologies.

In 1885, the Patent Monopoly Act was passed and it is regarded as the source of our existing Patent Law. Thus, this year is the 92nd anniversary of the entry into force of the patent system.

In the 1860s, Japan was characterized by handicrafts industries, small-scale trade, resource shortage and serious poverty. The Government therefore made every effort to accomplish, in one generation, the same modernization of the State as other countries accomplished in several centuries. Looking back now, we may say that this has actually been successfully achieved in only one century.

In the years of national isolation, the industries of Japan remained almost undeveloped except in very limited fields such as chinaware, cloth weaving and tea manufacture.

In the 1870s and thereafter, the Japanese turned their eyes towards the excellent overseas technologies, and were willing to make efforts to improve their own technologies and develop new technologies, and also to introduce overseas technologies and industrialize them within the State. Needless to say, the patent system played a very important role, in these circumstances, as a support to be relied on in promoting the development of new technologies and technology transfers. Thus, Japanese industries have gradually established their basic foundations and made such progress that they now export their technologies even to technologically advanced countries.

For example, weaving machines had been operated only manually until the 18th century. In 1897, however, weaving machines were first operated by steam engines by Sakichi Toyoda. Sakichi Toyoda and his staff made a number of inventions relating to weaving machines. In 1926, Kiichiro Toyoda, one of his sons, invented an automatic power loom. The patents for this automatic loom, which had been obtained in Europe, Canada and India, were bought in 1929 by the world-famous Platt Brothers Company, Ltd., in Great Britain at a cost of \$100,000. This may seem to be something of an advertisement for our companies, but it was these \$100,000 that enabled us to promote the research and development of automobiles, followed by the establishment of the Toyota Motor Company, Ltd.

As for the iron and steel industry, Japan possessed the traditional technology for smelting iron, represented by Japanese swords for "SAMURAI" or warriors, using iron sand.

Since Japan is not blessed with raw ore, it was not until 1901 that a blast furnace was first made in Japan. The production of iron and steel had relied on the technologies introduced from abroad until the Japanese invented in 1922, or later, the process for producing iron and steel from the poor ore available in Japan.

More recently, in 1956, Japan introduced a process for producing steel using an oxygen converter developed in Austria in 1951, known as the "LD process." This LD process was digested and absorbed by the Japanese so rapidly that only two years later, in 1958, the Japanese were able to invent, by applying the LD process, a new method for collecting unburnt components existing in exhaust gases, known as the "OG process." This OG process is now licensed to the United States of America, Great Britain, Western Germany and Austria.

In the field of chemical industry, industrialization of ammonia synthesis was achieved solely by technologies imported from abroad. In Japan, an invention relating to ammonia synthesis was first patented in 1910, and the inventors of this invention and other inventions relating to ammonia synthesis patented before 1921 were all foreigners.

It was in 1919 that the importance of ammonia synthesis was realized in Japan and research into ammonia synthesis was started. In 1923, ammonia synthesis was put into practice using patented methods and imported facilities. It was in 1922 that a patent for ammonia synthesis was first granted to the Japanese, and it was as late as 1931 before ammonia synthesis using that invention could start in Japan.

The technologies of ammonia synthesis introduced from abroad were completely digested by the Japanese chemical industry in the 1940s. Then, in the 1950s and thereafter, research and development on improved and applied technologies were actively conducted by Japanese researchers, resulting in the development of a new method of synthesizing urea which combines an ammonia synthesizing process and a urea synthesizing process. The patent for this invention has been licensed to 30 factories in 19 countries, and the invention is regarded as one of the excellent technologies developed by the Japanese.

As mentioned, Japan adopted a government policy of industrialization about a century ago, learned and introduced

excellent overseas technologies, and made continuous efforts to develop new technologies on the basis of those technologies and to put them into practice.

The establishment of the patent system contributed greatly to this objective.

In addition, it was very fortunate for Japan that the patent system, including the Patent Monopoly Act, which entered into force in 1885, as well as revisions of patent laws adopted thereafter, was not a system designed to offer material rewards to inventors from the State, but rather a system recognizing the inventor's or his assignee's right to receive for himself all the benefits which resulted from the working of his invention and to exclude others from working the invention without his consent.

Under the protection of this patent system, many patent applications for excellent overseas technologies were filed by foreigners and subsequently patented and published. These foreign technologies, for which licenses were given to the undeveloped Japanese industries, greatly served the progress of industrialization in Japan. Further, on the basis of these technologies, improvements and new developments of technologies could be made and put into practice.

Japanese industry during the 90 years after the entry into force of the patent system may be divided into three periods:

the first is the period between the 1880s and the early 1910s, when overseas technologies were introduced and put into practice;

the second is the period from the late 1910s to the 1940s, when both overseas technologies and technologies improved in Japan were put into practice; and

the third is the quarter of a century from the 1950s up to the present day, when the rapid technical progress and industrialization of Japan were accomplished on the basis of both the superior overseas technologies and the domestic technologies; the fact that Japan can now be called a "developed industrialized country" owes much to the efforts made by the various industries during this quarter of a century.

Recently, Japanese industry's income from foreign countries by technology transfers, which mainly comprise patents and technical know-how, has been increasing. In 1971, for

example, such income was 78 million dollars, while in 1974 it was 196 million dollars, thus showing an increase of about two and a half times that of 1971. On the other hand, payments by Japanese industry to foreign countries for technology transfers amounted to 386 million dollars in 1971 and 548 million dollars in 1974. This means that the ratio of income to payments, which was 20.2% in 1971, increased to only 35.7% in 1974.

I believe that in the near future the ratio of income to payments for technology transfers will reach 1--that is, 100%--as in Great Britain and France, which means that income and payments will be about the same, since an understanding of the patent system now prevails among Japanese researchers and companies, although it may be difficult to make it more than 9--that is, 90%--as in the United States of America.

Generally, patent specifications disclose accomplished technologies with a reasonable number of embodiments, and therefore offer more detailed explanations and are more useful than technical papers published by academic groups and associations. For effectively developing new technologies and putting them into practice, the investigation of the prior art in the related field is necessary, and patent documents play an important part in serving this purpose. Patented technologies in non-related fields are also of great help in research and development.

Sakichi Toyoda, whom I have previously mentioned, and his staff subscribed to the Japanese Official Gazettes for both patents and utility models in all patent classifications in order to find technologies helpful in their research and development. They also bought foreign official gazettes to review the technologies in countries advanced in each technical field, for reference in their business and technical developments. For example, "Abridgments of Patent Specifications" published by the British Patent Office were bought in the 1910s as far back as 1867, the year of the birth of Sakichi Toyoda. All inventions relating to textile machines were read and commented, each with a brief opinion, by himself or his staff. These efforts were well reflected in their research and development and resulted in the development of an excellent automatic loom. The patent of this machine was sold to a company in Great Britain which was at that time advanced in the field of textile machines.

As mentioned before, a patent specification is a technical document which discloses an accomplished technology concretely. Therefore, working an invention as it is

disclosed in the patent specification will enable the object of that invention to be attained, although imperfectly. However, in commercially working the patented technology, technical know-how not disclosed in the patent specification is usually needed for the production of goods of excellent performance or for their production with great efficiency.

This is a well-known fact, especially in the chemical field.

Device inventions also often require technical know-how. Here is my own experience. Since Japan is a small, overpopulated country, there is a great demand for measures against atmospheric pollution. Purification of exhaust gases of automobiles is one example. Since the 1960s, our laboratories have been engaged in research regarding the improvement of combustion in internal combustion engines for automobiles. Through such research, an internal combustion engine was invented in which a small auxiliary combustion chamber was provided adjacent to a main combustion chamber, the air-fuel mixture within the auxiliary combustion chamber was ignited by an ignition plug, and the resultant flame was jetted out into the main combustion chamber to fire the air-fuel mixture in that chamber. This invention was found to be effective for purifying exhaust gases. The researchers insisted that the invention was novel since it had not appeared in any research report. The fact was that we members of the Patent Department found as a result of investigations into patent documents that the invention had been disclosed in the specification of an invention patented in the United States of America in the 1930s.

However, through our research and development, we knew that the commercial production of this internal combustion engine with an auxiliary combustion chamber would require much technical know-how on design matters not disclosed at all in the United States specification. For example, if the capacity and shape of the auxiliary combustion chamber and the direction of the jetted flame are not within a certain range, the internal combustion engine will run only with insufficient power and purification of exhaust gases will not be attained. Thus, we have developed a few inventions and much technical know-how regarding this internal combustion engine.

Japan has made remarkable progress from an industrially undeveloped country in the years of national isolation to a "developed industrialized country" within only about one century. Of the last 100 years, the first 40 were the years

of introduction of excellent foreign technologies under the protection of the patent system and their industrialization. The subsequent 30 years were the years of introduction of new foreign technologies, improvement of introduced technologies and industrialization of improved technologies. The progress of Japanese industry during those 70 years owes much to technology transfers and encouragement of inventiveness and research and development, under the protection of the patent system. The Japanese learned many excellent foreign technologies from patent specifications and other technical documents. However, Japan's industrialization could not have been achieved only with technical knowledge obtained from technical documents. Here, I wish to emphasize that a lot of technical know-how was also needed for the industrialization of new technologies, and such know-how could only be introduced into Japan under the protection of the patent system.

As mentioned before, the Japanese patent system is a system for recognizing an inventor's right to receive the benefits resulting from the working of his invention and to exclude others from working the invention without his consent. With this very system, it was possible to introduce into Japan the latest overseas technologies of each respective period together with the relevant technical know-how. It is true that a large amount of money had to be paid to foreign countries for such technology transfers. However, when we evaluate Japanese industrial production, the technical foundation now established in industries and the increased abilities in research and development attained as a result of those technology transfers, we are well aware that Japan has achieved a great deal of benefit indeed.

During the quarter of a century after the 1950s, Japanese industry has not only introduced prominent technologies from abroad based on previous experience, but has also put into practice new technologies it has developed itself and which have greatly contributed to the rapid progress of industrialization. Also, many Japanese technologies have been exported to foreign countries, most of these exports being made under the protection of the patent system in each country. However, even nowadays, payments of license fees from Japan to foreign countries tend to exceed the income received in Japan from abroad. This means that Japanese industry still continues to introduce many excellent technologies and much technical know-how from abroad by paying royalties. The technologies which have been introduced, together with self-developed Japanese technologies, have led to excellent industrial production and an increased technical potential of industry. I believe that under these circumstances Japanese products have gained confidence and the Gross national Product has increased.

Today's communications and transportation much excel those of 100 years ago. Nowadays, the desired technical information and machinery equipment are very rapidly available. A century ago, Japanese industry took a great deal of time to find out about the world's excellent technologies. If there had been today's advanced communications and transportation at that time, Japan might have attained its industrialization in only 50 years, or even 30 years, rather than 100 years.

Unlike the world with which Japan was confronted a century ago, today's world presents very favorable circumstances for the development of industry. And, finally, upon reviewing the history of the industrialization Japan has experienced during this one century, I wish to emphasize the necessity of encouraging inventiveness and positive technology transfers, and I believe the patent system to be a very important tool for this purpose.

THE IMPORTANCE OF PATENTS FOR THE ACQUISITION IN DEVELOPING
COUNTRIES OF UP-TO-DATE TECHNOLOGY AND KNOW-HOW

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Current debates at the national and international levels show that there is a wide consensus on the urgent need to reduce the unfortunate technological and socio-economic gap between countries at widely differing stages of development. It is agreed by the world community that more balanced progress must be achieved, notably by an increased flow of suitable technology from industrial nations to less developed countries on fair and mutually acceptable terms. The complexity of the problem, the avalanche of international studies and reports, as well as the various interests involved, represented by private parties and by supplier and recipient countries, have inevitably led to some controversy, above all in United Nations forums, on the adequacy of proposed remedial measures for the achievement of the common goals. Such differences of opinion can only be overcome by constructive dialogue between all partners within the framework of a new situation of interdependence, concerning primarily natural resources and industrial technologies. The modest contribution which I can make, from a private industry's point of view, attempts to further such an amicable dialogue.

With this in mind, my submission focuses on the question whether or not, on balance, effective patent protection for inventions, as well as the recognition of confidentiality for independent or ancillary know-how, can stimulate the contractual transfer to developing nations of intermediate or updated technology, to be adjusted for efficient use in productive investments if and when desired by host countries. My comments are based on the assumption that the infrastructure of the recipient country permits absorption of the selected patented and/or non-proprietary modern know-how, whether capital or labor-intensive, in accordance with domestic plans or priorities, and that continuous assistance and training, if required, will be granted by a technology supplier who has concluded a licensing or technical assistance agreement.

When reviewing the many studies and reports issued, above all by experts of United Nations organizations, and when considering the motivation for the legislative erosions of industrial property that are enacted in various countries, as well as the claims for an overhaul of the traditional Paris Convention, it is clear to me that the patent system itself is sometimes being blamed for setbacks suffered in the Fourth World that are attributable to other factors, such as one-sided technological and economic capabilities, including discrepancies in scientific levels and human resources. I have also noted that generalized accusations are repeatedly made which concern the real or alleged abusive behavior of patentees rather than defects of the classical patent system itself. In fact, the criticism advanced in support of demands for a new economic order centers mainly on two issues, namely, that patents inhibit the flow of technology because they are predominantly owned by foreigners, and that the vast majority of such patents are not industrially worked within developing countries and so create burdensome import monopolies provoked by the corporate strategy of profit-minded multinational corporations. This reasoning is complemented by the contention that, in the rare cases of genuine local exploitation, the regularly weaker national partner is subjected to restrictive contractual clauses preventing industrial expansion and export chances.

Within the scope of this submission I intend to limit my reply to these contentions to the following observations.

Official WIPO statistics demonstrate that, to varying degrees and with the exception of the United States of America and Japan, the great majority of patents issued in industrialized countries are also owned by foreigners, because the total of patentable inventions always exceeds the number of local discoveries. The unsatisfactory disproportion in the origin of research results is therefore not a defect of national or conventional patent systems, and consequently can only be modified by encouraging indigenous innovation in less-developed countries. In my view, such innovation is hardly attainable by abrogating or weakening patent protection.

I do not deny that there is a high degree of non-working of patented inventions in developing countries, despite the existence of sanctions permissible under the Paris Convention. But here again certain conclusions regarding alleged nefarious corporate behavior must be seen in the context of international business realities.

First of all, I estimate that between 30% and 50% of all patents issued anywhere are not exploited at all, either commercially or industrially, for reasons that have nothing to do with basic defects of the patent system or with abusive practices of patentees. Taking into account certain risks attached to productive investment in developing countries, as well as problems relating to domestic resources, education and infrastructures, it must nevertheless be appreciated that, compared with the situation in the past, an increasing number of patented inventions, often linked to know-how for their optimum use, are progressively being worked in the Third World. However, the technological and economic interdependence of nations, coupled with the oil crisis, monetary chaos and recession, simply prevents the owners of technology from simultaneously working one and the same patented invention in dozens of smaller countries which all tend to favor local production and exports whilst limiting imports and royalty transfer. To some extent at least, all these factors also affect medium-sized firms, which often wish to enter into cooperative arrangements for the exploitation of their suitable and transferable technology, but fear local insecurity and instability.

Reference to such realities in no way diminishes my belief that, if reasonable conditions for domestic working, including an adequate market, prevail, then patented technology should in one way or another, and without undue delay, be implemented, in order to justify the essential and time-limited exclusivity inherent in meaningful patent protection. However, without a favorable general climate and without a fair degree of contractual freedom, technology transfer, continuous assistance and training cannot be provided. Compulsory licenses, if subject to appropriate grace periods and available according to streamlined procedures, are often helpful, although their indirect effect is not always evident. Admittedly, such mandatory sanctions cannot, as a rule, secure the transmission of the necessary additional know-how by an unwilling patentee, so that a voluntary patent and know-how license agreement is always preferable as an inducement to a mutually rewarding partnership in the success of which all the parties involved will have a genuine interest. In order to achieve the acquisition of updated and adjustable technology, the recognition of patents having a reasonable initial or total life and providing real protection against the importation of imitations is, in my submission, a prerequisite for the successful local working of innovations suitable for domestic industry and agriculture, to be carried out by intracorporate or joint-venture operations.

It is significant to observe that government officials who strongly object to so-called "patent monopolies"--although patents take nothing away from the public domain in view of novelty requirements which are controllable, for instance under the PCT--often support flexible incentives in the form of exclusive manufacturing permits or tariff protection, which generally have effects similar to those of valid and enforceable patents. It is also significant to observe that, during recent debates on the proposed revision of the WIPO Model Law, many delegates from developing countries endorsed recommendations aimed at strengthening the position of national compulsory or voluntary licensees against infringing competition. Such an attitude is understandable, because domestic licensees face the same legal, psychological and economic problems as foreign or national patentees when they embark on industrial investments for the exploitation of modern technology. Finally, it should be stressed that no examples exist to demonstrate that, when adopted, the abrogation or severe restriction of patent protection has led to more technological cooperation and to more rapid industrialization. In particular, immunity for infringing imports has not--owing to a shift in profits--resulted in long-term price reductions, but has rather reduced the willingness of innovators to engage in local research and self-reliant production.

I recognize that the role which patents play, among other manifold elements on which management decisions are based when technology transfers and productive investments in developing countries are planned, may vary according to branches of industry and territories; but I am equally convinced that the absence of enforceable patents will certainly not stimulate the transfer of technologies by means of licenses and know-how disclosure. I also admit that the absence of local patents may in certain cases be irrelevant if the disclosure in foreign patent specifications alone permits the application of inventions, perhaps with the help of accessible know-how from alternative sources. Nevertheless, I would emphasize that, as a rule, the protection provided by a licensed patent and the accessibility of related original know-how possessed by the patentee are the best ways of achieving long-term working and quality production, above all if exports can to some extent be facilitated under co-licensed foreign patents. At any rate, both parties and the recipient country must agree upon reasonable terms and fair compensation, as a contribution to the expensive research activities of the technology supplier, be it a private Western firm or a Socialist State enterprise. This aspect is often neglected in the current debates on a recommended UNCTAD Code for Technology Transfer.

In this context, a reference should also be made to the trend towards prohibiting intracorporate royalty payments, treating them as profits or levying excessive withholding taxes. My evaluation of the relevance of patents in the acquisition of suitable technology in developing countries is borne out by the example of Japan's economic recovery after World War II. I also refer to the pro-patent conclusions reached by the 1974 African Seminar on Industrial Property held in Yaoundé under the auspices of WIPO pursuant to its Permanent Legal-Technical Program for less-developed countries within or outside the Paris Union.

We may thus provisionally conclude that patents are an important element in stimulating the working of new and useful inventions and complementary know-how, and that consequently they facilitate and enlarge technology transfers in the light of economic objectives which have been added to the original rationale for the protection of inventions.

However, this conclusion alone cannot be the answer for developing countries, many of which--rightly or wrongly--feel that patents have not in the past contributed as expected to national progress. Therefore, we should now turn to what we consider the crucial aspect of this complex problem, namely, the question whether or not the exclusivity for manufacture, and above all for importation, is justified even when a foreign patentee abstains from direct or indirect domestic working of the patented invention. This question also constitutes the essence of the revision debates on Article 5A of the Paris Convention, which somewhat restricts the wide legislative freedom of member States.

When analyzing this problem we should, at the outset, leave aside those issued patents which--although covering updated technology--are exploited nowhere, and may be abandoned sooner or later because, for instance, marketing of the new products may be either obsolete or premature.

Moreover, we should again refer to situations which for evident economic reasons prevent simultaneous and parallel working of one and the same patented invention in many developing countries of the world. Particularly in some economically integrated areas, the need for a reasonable division of industrial activities is generally acknowledged. Consequently, it must be admitted that legitimate reasons may exist for non-working of patented inventions.

As regards the remainder of non-worked patents which, in the light of technical, financial, and commercial considerations, might sooner or later be exploited in developing countries, one must bear in mind that, with more sophisticated but desirable innovations, there is a time-lag of about 8 to 10 years between the conception of the invention or the filing of the relevant patent applications on the one hand, and the initiation of local manufacture in a certain developing country on the other. In my consultancy paper for WIPO on Article 5quater of the Paris Convention, I outlined, with particular reference to the chemical and pharmaceutical industry, the objective reasons for such inevitable delays, which affect patentees and potential domestic licensees equally. Furthermore, it often happens that the views of the government of a developing country coincide with the opinion of patentees, namely, that there are legitimate arguments against local working and in favor of less costly imports, which involve no royalty burden on the balance of payments.

However, if the industrial working of a patented invention is feasible and contemplated in a developing country, an inevitable prerequisite for entering into often risky investments and technological cooperation is the building-up of a market under the umbrella of an issued patent. Absence of protection, excessive shortening of patent terms or immunity for infringing imports would thus be damaging. Full protection from grant to expiry of the title is consequently a prerequisite for the acquisition and working of technology and supplementary know-how. We must also be aware that in many fields the industrial integration to be attained by developing countries is inevitably a step-by-step evolution which cannot be precipitated by legislative constraints.

The objection frequently raised to the availability of genuine patent protection before domestic manufacture is or can be commenced in developing countries, namely, that such protection, equivalent to an import monopoly, will raise the prices of required goods, should not be over-emphasized. Admittedly, the effect of patent exclusivity is a cost element in a system providing for a contribution to a return on present or future investments in research and manufacture; but in most cases competition by substitution of equivalent products from sources not controlled by patents is possible, as patent claims provide only temporary cover for specific products and/or processes. The incorporation of price policies in patent laws has, in practice, turned out to be an incomplete and inefficient measure in any case. It is therefore inconsistent and incompatible to allow patents as a vehicle for industrialization and, simultaneously, to undermine their effect, in order to generate more price competition, by freedom for imports or by mandatory import licenses. The threatened availability of non-exclusive compulsory licenses for

local manufacture, coupled with immediate mandatory licensing if vital public interests must be safeguarded, is a more adequate policy than a priori rejection of industrial property or excessive inroads into patent protection. I would also endorse proposals such as those discussed in the WIPO Model Law revision debate, according to which a normal patent term can be prolonged in the case of local working of the patented invention. Inventors' certificates may, in Socialist countries, promote local inventiveness, but they are not an effective instrument for the inflow of foreign technology, which, in developing countries, is more likely to be encouraged by the addition of technology transfer patents, as also envisaged in the revised WIPO Model Law.

In these circumstances, I take the liberty of presenting the following final conclusion:

In the light of cost/benefit evaluations, national patent laws for developing countries are the best method of contributing to an increased inflow of desired and suitable updated technology and know-how for the benefit of industrial and agricultural progress. Such laws must be adjusted to the specific needs and priorities of each country, in line with a domestic policy that favors a fair internal distribution of income, quality of life and indigenous culture. Nevertheless, the essential exclusivity of patent rights must be preserved, subject to remedies against genuine abuses.

The first consequence of such an adequate patent system is improved access to international technology and to disclosed valuable non-patented know-how. The inducement provided by protection for the benefit of local manufacture has, in the long run, the second consequence of easing balance of payments and trade deficits by generating domestic "added values," possibly coupled with some exports of quality-controlled products. The third consequence is, or at least could be, a spill-over effect on secondary industries and on the consumption of national resources, leading possibly to more employment, professional training and autonomous improvements.

These net benefits cannot be achieved, however, without a mutual and confidential understanding between all private and official partners on the various legitimate interests to be respected in support of any long-term cooperation in the exploitation of patented or confidential technology for the

benefit of genuine economic and social progress. In these circumstances, the recognition of effective patent protection is, on balance, an important element in encouraging and facilitating the acquisition and exploitation of suitable updated technology in developing countries under contractual and other conditions which conform to the reciprocal, long-term and legitimate interests of all partners.

PATENT LAW IN INDIA AS A MEANS TOWARDS
ACCELERATING INDUSTRIAL DEVELOPMENT

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The world has witnessed tremendous advances in the field of science and technology during recent times, but the fruits of the modern technological revolution have not been shared by all the nations equitably. While these technological advances have contributed further to the economic progress of the already developed countries, they have not helped in promoting the economic standards of the developing countries, with the result that the gap between the developed and the developing countries, instead of being bridged, is widening day by day. It is universally believed that lasting peace in this world, which is so essential for human survival, can only be achieved by bridging the gap between the developed and the developing countries. It was in this context that the General Assembly of the United Nations adopted the declaration on the Establishment of a New International Economic Order at its Sixth Special Session in May 1974, calling upon all the States to take measures aimed at eliminating the widening gap between the developed and the developing countries and to accelerate the economic and social advance of the developing countries.

There cannot be two opinions on the question that the economic advancement of the developing countries depends upon their expeditious industrialization. It is universally acknowledged that the patent system plays a vital role in the rapid industrialization of the country. I should, however, hasten to add that the system should be so designed as to serve the best interests of the country in encouraging indigenous talents and should at the same time act as a vehicle for transfer of technology from developed countries.

The concept of the patent system as a means for industrialization is founded upon the following main objectives:

Firstly, it stimulates the inventive faculty of mankind to make new inventions which are so essential for industrial development;

Secondly, it helps in the commercial exploitation of new inventions by providing protection against unfair trade competition in the infancy of the commercial exploitation.

So far as the developing countries are concerned, it is the second objective which is much more important than the first. It is the actual commercial utilization of patented technology which not only contributes to the industrial development and economic advancement of the nation but also serves as a basis of the first objective because it is the commercial working of inventions which brings in the financial returns to the patentee to serve as a further incentive for research and inventive activity. The concept of exclusive privilege associated with the patent grant which provides the necessary protection against unfair trade competition during infancy plays its role only if the invention is actually put into commercial production. Unfortunately, this basic concept of the patent system tends to be overlooked and it is sought to use the system more in safeguarding the rights of the patentees than in working inventions for achieving the main social objective of rapid industrial growth leading to higher levels of well-being of the people at large of developing countries. Foreign nationals who obtain patents in developing countries prefer to work their inventions abroad and then import the product into the country of grant from abroad. The grant of patents in such cases, instead of contributing to the industrial development of the developing countries, acts as the instrument for a monopoly of importation of products from abroad to the detriment of the developing country granting patents. The result is that, although thousands of patents are granted in the developing countries every year, their contribution to the industrialization and economic advancement of the country is quite negligible.

There is no denying the fact that by and large the patent system has failed to fulfil its fundamental objectives in the developing countries. There is a growing awakening in the developing countries to the need to redesign their national patent legislations in such a way that they achieve their intended objectives. Though it is true that patent rights are granted in favour of individuals or corporations, entitling them to work their patented inventions and also to authorize others to do so, the State in the wider perspective of public interest has to see that such rights are not

abused by the patentees. It appears essential that, in the national patent legislations of the developing countries, necessary provision must be made to achieve an even balance between the private right of the patentee to work his patented invention and the right of the public at large to see that the patented invention is worked in the country to contribute towards industrial and economic advancement. Mr. P.J. Michel in his treatise on "Principal National Patent Systems" expressed the same view by observing that "patent systems are not created in the interest of the inventor but in the interest of the national economy. The rules and regulations of the patent system are not governed by civil or common law but by political economy."

A developing country which aims at establishing a Welfare State has to take all the necessary measures to ensure the optimal use of technology for the country's benefit. In that context, it would be necessary to make suitable provisions in the national patent legislations of the developing countries enabling the State to secure necessary technological inputs for the country's industrial development. Such provisions must strike a fair and equitable balance between the individual rights of the patentees on the one hand and the public interest on the other hand. This necessity of a decisive shift in favour of the recognition of the public interest in the balance of the monopoly patent rights appears to be paramount in the case of developing countries and must be recognized. Such a shift can be achieved by suitably reshaping the national patent legislations of the developing countries.

Indian Patents Law

The patent system in India has been in force since 1856 but it had not served the national interests. After attainment of independence, it was felt necessary to make a comprehensive review of the law relating to patents in India to determine whether it suited India's developing economy. The review was the subject of two expert enquiries, the first one undertaken by the Patents Enquiry Committee and the second by Shri Justice Rajagopala Ayyahgar. Both these enquiries revealed that "the Indian Patent System has failed in its main purpose, namely, to stimulate inventions among Indians and to encourage the development and exploitation of new inventions for industrial purposes in the country so as to secure the benefits thereof to the largest section of the public."

Since, after independence, industrialization in the country was declared to be the basis for the developing economy, it appeared to be quite obvious that the patent law in the country required revision with a view to achieving rapid industrialization and to obtaining as quickly as possible a fairly advanced level of technology. It was felt necessary to incorporate provisions for compulsory working of patented inventions in the country in the public interest, compulsory licences and licences of right to prevent abuse of patent rights by patentees who use the system as a means of securing an importation monopoly without commercially exploiting the patented invention within the country that granted the patent to promote its national industry and economy. With these objectives in view, the patent law in India has been revised and the important highlights of the new Patents Act, 1970, are as follows:

1. General Principles of Patent Grant. The Act recognizes the importance of the fundamental objectives of the patent system, namely, stimulating inventions and encouraging the exploitation of new inventions for the industrial progress of the country. Section 83 of the Act enunciates the general principles of the patent grant as follows:

- "(a) that patents are granted to encourage inventions and to secure that the inventions are worked in India on a commercial scale and to the fullest extent that is reasonably practicable without undue delay; and
- "(b) that they are not granted merely to enable patentees to enjoy a monopoly for the importation of the patented article."

These basic principles and the general philosophy of the system are unexceptionable and are universally accepted. The Paris Convention as it exists at present permits legislative measures to be taken to prevent abuses of the patent. It has been estimated that 84% of all valid patents in developing countries are foreign-owned, that most of these are in the hands of supra-corporations based in five developed market economy countries and that 90 to 95% of these foreign-owned patents are unused in production in the developing countries.

Non-working of patents has therefore been one of the serious concerns of the developing countries, where patents are largely taken out by foreigners to secure a monopoly for importation of the patented articles from abroad. "Such action not only thwarts national inventive activities but

also imposes severe burdens, through higher prices for imported products, on the foreign exchange balance of developing countries" (UNCTAD Report on the Role of Patents, April 1974). The United Nations Secretary-General in his Report on "The Role of Patents in the Transfer of Technology to Developing Countries" (1964) has aptly emphasized the anxiety of the developing countries in the following terms:

"...the Government of an under-developed country, equally legitimately and using a set of cost and benefit calculations different from the private profit-cost calculation of the foreign patentee, may conclude that it would be desirable to have the patented product produced in the country rather than import it. The utilization of domestic materials, employment and training of domestic labour, saving in foreign exchange, etc., may all play a part in such calculation. The establishment of the industry making the patented product or using the patented process may, in fact, be an explicit part of the development plan of the under-developed country. Even where this is not so, its establishment may still be desired. It is this problem which is at the heart of the difficulty and controversy concerning the effect of a patent system on underdeveloped countries, as far as products or processes are concerned."

2. Inventions. Under the Indian Patents and Designs Act 1911, "invention" was defined as "a manner of new manufacture," a phrase adopted from the United Kingdom Statute of Monopolies. This phraseology was the subject of innumerable decisions and, though several general principles were evolved, considerable areas of uncertainty prevailed. While enacting the new Patents Act with a view to putting this matter beyond ambiguity or uncertainty, it was considered more appropriate to stipulate in the Act itself what are not inventions within the meaning of the Act, apart from a more precise definition of the term "invention." Section 3 of the Patents Act contains a list of inventions which are not considered as such and thus are not patentable, as follows:

"(a) an invention which is frivolous or which claims anything obviously contrary to well established natural laws;

"(b) an invention the primary or intended use of which would be contrary to law or morality or injurious to public health;

- "(c) the mere discovery of a scientific principle or the formulation of an abstract theory;
- "(d) the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant;
- "(e) a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process for producing such substance;
- "(f) the mere arrangement or re-arrangement or duplication of known devices each functioning independently of one another in a known way;
- "(g) a method or process of testing applicable during the process of manufacture for rendering the machine, apparatus or other equipment more efficient or for the improvement or restoration of the existing machine, apparatus or other equipment or for the improvement or control of manufacture;
- "(h) a method of agriculture or horticulture;
- "(i) any process for the medicinal, surgical, curative, prophylactic or other treatment of human beings or any process for a similar treatment of animals or plants to render them free of disease or to increase their economic value or that of their products."

Under Section 20 of the Atomic Energy Act of 1962, inventions relating to atomic energy were already rendered unpatentable. Section 4 of the Patents Act reiterates this position.

3. Principle of National Treatment. The new Patents Act does not put any limitations or restrictions on foreigners in the matter of applying for or obtaining patents in India.

Science and technology have no territorial barriers and there is no discrimination, as such, between nationals and non-nationals in any respect and all provisions of the Act are applicable to both nationals and foreigners. However, Section 134 of the Act provides that, where any country does not accord to the citizens of India the same rights with respect to the grant of patents and protection of patent rights as it accords to its own nationals, no national of such

country shall be entitled to any privilege under the Indian law.

4. Novelty Search for Patents. The scope of anticipation by prior publication, which would adversely affect its novelty and consequently patentability, has been extended from prior publication in India as provided in the repealed 1911 Act to prior publication anywhere in the world as stipulated in the Patents Act, 1970. Prior publication anywhere in the world is also a ground for opposition and revocation of the patent under Section 25 and Section 64 of the Act, respectively. The object of the extended search is that an invention which is published abroad before the date of the corresponding application in India should not qualify for the grant of a patent in India, bringing the legal position in India in this respect into line with most of the other countries of the world.

5. Patentability of Inventions in the Area of Chemicals, Food and Drugs. Section 5 of the Act provides that, in the case of inventions relating to substances intended for use as food, drugs or medicines, or substances produced by chemical processes, patentability will be limited to claims for the methods or processes of manufacture only. In other words, patents containing claims for the substances themselves, such as chemical substances, food, drugs, alloys, optical glass, semi-conductors and intermetallic compounds, are not allowable in such cases. A provision of this nature is not unique or novel. In fact, many of the European countries, particularly when they were in the developing stage, had similar restrictions with regard to patentability on such inventions. The rights of the patentee in respect of inventions in this field extend only to using or exercising the patented processes in India and not to the product itself. The object of this provision is to encourage research in the chemical field to arrive at alternative processes for the manufacture of chemical products, as a claim to the products themselves would have acted as a brake on further research and would have retarded the development of new manufacturing processes.

6. Term of the Patent. The term of a patent granted under the Act in respect of an invention relating to food, medicines or drugs is 5 years from the date of sealing of the patent or 7 years from the date of the patent, whichever period is shorter; and in respect of any other invention the term of the patent is 14 years from the date of the patent, subject to the payment of the prescribed renewal fees within the prescribed period.

In the field of inventions relating to food, drugs and medicines, which are so vital to public health, there has been a strong section of opinion according to which there should not be any patent protection at all. The medical profession in India--and perhaps also in other countries--considers it unethical to grant proprietary rights for such inventions and make them a means of profiteering. The Restrictive Trade Practices Commission in Canada pointed out that high prices for drugs and pharmaceuticals were largely due to patent protection. Similar views were also expressed before the United States Congress. The Indian Parliament has considered the views and has struck a fair and reasonable balance in enacting the present law. While the law has retained patent protection in this field, it has nevertheless provided a shorter term of patent protection with a view to stimulating quicker commercial working of patented inventions within the country, thereby making these common necessities available in adequate quantities and at reasonable prices.

7. Working of Patented Inventions. In pursuance of the general philosophy enunciated in Section 83 of the Act, namely, that patents are granted to encourage inventions and to ensure that they are worked in India on a commercial scale and are not granted merely to enable patentees to enjoy a monopoly of importation of the patented articles, several provisions have been incorporated in the Indian Act.

(i) Licensing: To remedy the handicaps of the developing countries arising out of the non-working of patented inventions in such countries for the benefit of indigenous industrial development, the Act includes adequate provisions to counteract such abuse of the patent rights by patentees. Compulsory licences can be applied for at any time after the expiration of 3 years from the date of the sealing of the patent on any of the prescribed grounds. In view of the paramount importance of food, medicines and drugs to public health, it was considered necessary that the licences in respect of patents relating to food, medicines and drugs, and also chemicals in general because of their importance for the production of the former, should be available much more conveniently and expeditiously. Accordingly, the Act provides that all patents granted in respect of food, medicines, drugs and chemicals shall, upon the expiration of a period of 3 years from the date of their grant, be deemed to be automatically endorsed with the words "Licences of right." The effect of such an endorsement is that any person interested will have a licence more or less as a matter of right under such patents. The Controller may, before the terms of the licence have been mutually agreed upon or decided by him, permit the

prospective licensee to work the patented invention on such terms as the Controller may think fit to impose, pending agreement between the parties or decision by the Controller. This provision is intended to ensure that legal proceedings do not delay the establishment of manufacture in such vital fields as food, drugs, medicines and chemicals.

(ii) Revocation of Patents for Non-Working: A patent may be revoked by the Controller after the expiry of 2 years from the date of the grant of the first compulsory licence, or from the date of the grant of the first licence in respect of a patent endorsed with the words "Licences of right," on the request of the Central Government or any person interested on the ground that the reasonable requirements of the public with respect to the patented invention have not been satisfied or that the patented invention is not available to the public at a reasonable price (Section 89).

In order to enable the Controller to keep a watch on patented inventions in India, the Act makes it obligatory for every patentee/licensee to furnish to the Controller information as to the extent to which the invention has been worked on a commercial scale in India.

In this connection, needless to say that, whatever steps a national legislation may attempt to take to counter the abuses of the patent system, unless they are backed by international convention and by the patentees themselves, the measures are not likely to yield the desired results. It is in this context that India has been strongly advocating the modification of some of the important provisions in the Paris Convention. The pervasive philosophy of the Convention appears to afford as much protection as possible to the patent holders. There is no explicit recognition of the basic objective that any patent system is expected to fulfil, namely, that it should, besides encouraging inventions, ensure that they are worked in the country where they are granted to the fullest extent possible without undue delay. Indeed the other principle which follows from the basic aspect that patents are not granted merely to enable patentees to enjoy a monopoly for the importation of the patented article is not only not recognized but there is a provision in Article 5A(1) of the Paris Convention which reads as follows:

"A.-(1) Importation by the patentee into the country where the patent has been granted of articles manufactured in any of the countries of the Union shall not entail forfeiture of the patent."

This is a provision which seems to encourage the importation of patented products. Instead of leading to the consummation of the patent in commercial manufacture, such provisions may discourage the establishment of production facility by the patent holder in the country which grants the patent.

Similarly the provision in Article 5quater of the Paris Convention which has a particular significance for the chemical and pharmaceutical industry, where the usual tendency is to import the product into the country where the patent has been granted, is not helpful from the point of view of the developing countries. Such a provision only helps the import monopoly principle, which is in direct opposition to the objective of domestic industrialization of developing countries.

Again, Article 5A(3) of the Convention provides that no proceedings for forfeiture or revocation of a patent may be instituted before the expiration of 2 years from the grant of the first compulsory licence, the grant of which shall be only after a period of 3 years from the date of sealing or 4 years from the date of filing of the patent application, which ever may expire later.

As it now stands, therefore, the Convention seeks to confront the problem of non-working only through the device of compulsory licences. The procedure for compulsory licensing has, however, in practice proved a complete failure because of several inherent difficulties in obtaining licences. This is the reason, therefore, that India has been urging that Article 5A of the Convention should be suitably amended to make it more responsive to the aspirations of developing countries.

It needs no emphasis that the success of the legislative measures taken by developing countries through their patent laws will largely depend upon the active support given by the International Convention on the subject.

8. Use of Patented Inventions by the Government. The provisions relating to the Government's use of patented inventions are contained in Section 100 of the Patents Act and these are more or less along the lines of the provisions under Section 48 of the United Kingdom Patents Act and Section 125 of the Australian Act.

In the context of the responsibilities which a Welfare State assumes, it was considered necessary to ensure that the existence of patent rights does not hamper its development or welfare activities. Therefore, for this purpose and

in order to ensure that scarcity of the patented article, including drugs and medicines, does not arise and lead to high prices, the Government is vested with powers of an enabling nature whereby it can make use of or exercise the patented invention merely for its own purposes.

9. Conclusion. As I have explained above, the main object of the Patents Act is to encourage research and inventions and to render the patent system a means towards accelerated development, no doubt through a well-regulated patent system, preventing the exploitation of a monopolistic patent position. As I have said earlier, we look forward to the modification of the International Convention so that such measures which the developing countries may take are not rendered ineffective.

THE ROLE OF FOREIGN INVESTMENT
IN THE INDUSTRIALIZATION OF BANGLADESH

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As I was asked to speak about the role of foreign investment in the industrialization of Bangladesh, I believe that the intention was to seek out some of the fundamental settings, following a long chain of backward linkages. The question of patents comes into the context of transfer of technology. Technology is needed when the country is on the path of industrialization. Industrialization cannot be achieved without capital formation. Since, in the Less Developed Countries, capital formation is slow and inadequate, foreign investment has to play a very important role. Before I come to the patent problems concerning patent legislation, I shall attempt to present to you briefly the prospects and problems connected with the industrialization process of Bangladesh. I think this is necessary as so often we find that the developed world either does not quite understand the problems of the less fortunate countries or misunderstands their aspirations.

Those of you who already know Bangladesh may be well aware that Bangladesh has been badly trapped in the classical vicious circle of low income, low savings and low productivity. Unfavourable physiographic and environmental conditions, high population density (80 million people huddled in a gross area of 55,126 sq. miles, actual density being over 2,500 people per square mile in many places), limited cultivable area (22,526 million acres including currently fallow land, that is, about 0.28 acre per head), and limitation of physical resources are posing formidable constraints upon development processes. Poor living conditions are manifest not only in the low per capita income (about \$82 per year at 1972-73 prices), but

raw materials needed by other sectors of the economy as well as provide expanding employment opportunities both directly and indirectly." This would be quite in consonance also with the concept of industrialization defined by the UN Committee on Industrial Development in its report on the Third Session of May 1963, which reads: "Industrialization is a process of economic development in which a growing part of the national resources is mobilized to develop a technically up-to-date diversified, domestic economic structure characterized by a dynamic manufacturing sector, having and producing means of production and consumer goods and capable of assuring a high rate of growth for the economy as a whole and of achieving economic and social progress." We shall therefore look upon industrialization not merely as the act of setting up factories for producing certain goods but as a complex tool for fostering rapid socio-economic progress.

Agriculture is providing for almost 80% of employment and 91% of export earnings, and, as such, it is bound to continue as the mainstay of the economy. But with time, its links with the industrial sector have to be closely watched and catered for. Primarily, agricultural growth is going to have two salutary effects on industry and will help to boost the latter: one is that, with the increase of income of the former, the demand for manufactured goods is bound to rise; the other is that technological innovations adopted for increasing agricultural productivity will call for greater use of fertilizer, pesticides, water, farm machinery, and other inputs, the supply of which will spur manufacturing activities. It is obvious that sustained agricultural progress will not be feasible without the corresponding development of industry, and, at the same time, industry is also dependent on agriculture for the supply of food, raw materials and markets. In the First Five-Year Plan of Bangladesh, the development outlay for agriculture, rural development and water resources was estimated to be Taka 10,670 million or 24% of the total plan outlay of Taka 44,550 million. But, in recent annual development programmes, these sectors are receiving substantially increased allocations of up to about 32% of the aggregate programmes. This will soon have its impact on industry in the obvious ways. Besides, with the improvement of transport and communication facilities and the wide access to transistor radios, as well as for other reasons, the general awareness and expectations of the rural population have increased, leading to an increase in the demand for consumer goods after the urban pattern by those who can afford them. All of this cannot be

denied and so, besides other considerations, industrial planning must also take care of the dynamic relationship that exists between the consumer behaviour of the agrarian society and the manufacturing sector.

In 1968-69, Bangladesh had 3,130 registered factories, of which 791 were in textiles, 576 in chemicals, 406 in food manufacturing, 257 in metal products, 207 in footwear, wearing apparel and made-up textiles, 149 in leather and leather products and 744 others. For all this, technology as well as plant and machinery had to be imported. In 1969-70, they produced 560 thousand tons of hessian, sacking, carpet backing and other jute goods, 106 million pounds of cotton yarn, 60 million yards of cotton cloth, 93 thousand tons of sugar, 96 thousand tons of urea fertilizer, 31 thousand tons of paper, 36 thousand tons of newsprint, 1,944 million cigarettes, 3 million gross safety matches, 7 million sq. ft. of glass sheets, besides other products. Out of these, 1,727 establishments had in 1970-71 total fixed assets of Taka 2,369 million, provided employment to 259 thousand workers, accounted for an aggregate value added of Taka 1,531 million, which rose to Taka 3,790 million in 1974-75 (see Annex 2). Although there was a reasonable private sector, the Government's contribution towards setting up many of these industries through the then Industrial Development Corporation, Small Industries Corporation and Forest Industries Development Corporation, either solely on their own or in partnership with private entrepreneurs, as well as through the efforts of the Government's financial institutions, was enormous. After the birth of Bangladesh, industries falling under the nationalized sector and those abandoned by absentee owners were handed over to a large number of Sector Corporations for management. During 1971, many of these establishments had suffered much physical loss and damage, and in the following periods their upkeep and management had also suffered badly, causing widespread dislocation in industrial production. With the exception of the refinery and certain industries in the engineering sector as well as fields like cement, fertilizer, etc., where there were some new capacity additions, most industries have not yet gone back to the 1969-70 level of production for a variety of reasons, let alone fully utilizing their rated installed capacities. New investment programmes in the industrial sector, therefore, have to start with a tremendous backlog of work for balancing, modernization and major replacements (BMR). But since many of the required machine parts are not readily available or cost too much, the question that has come up is how many of them can be manufactured within the country.

The 1974 Census indicated that in Bangladesh 91% of the population live in rural areas in 12.7 million households, distributed over 64,000 villages. A survey conducted by the Bangladesh Institute of Development Studies in 1973-74 had shown that 32% of all villagers in the country were unemployed or under-employed. For small farmers the figure was 30%; for medium farmers 39%, the highest of all; for large farmers 32%; and for landless labourers 29%, who, incidentally, worked harder than the others. A Planning Commission survey of 1973 indicated that the unemployment rate amongst the educated labour force, that is, all economically active persons with a Secondary School Certificate and above, was as high as 44%. No recent survey of the unemployment rate amongst urban people is available, but it is estimated to vary between 25% and 50% in the principal cities, not taking into account the temporary migrants to urban areas and the additional floating population drifting towards towns at times of natural calamities. The Agriculture Sector alone is not likely to provide employment for all these people. Although admittedly an arduous and complex task, within the broad framework of industrial and educational planning a good deal of effort will therefore have to be specially devoted towards promoting rural and household industries to absorb the above idle labour force as well as the new entrants expected with the population increase. The technologies involved in each type of industrial activity described above, such as production of consumer goods and producer goods as well as manufacture of machine parts and setting up of rural industries, all have characteristics of their own, and 90% of them will have to be imported.

At this point, we have to look at the economic scenario of Bangladesh in longer perspective and see how industry fits into it. The consultants for the Bangladesh Energy Study estimate that, given a medium-high pace of growth for agriculture and a rapid rate of import substitution, calling for a high rate of growth for both import and export, and relatively higher incremental Capital Output Ratios (2.75, 3.00 and 3.20 for successive decades), the GDP of Tk.4,712 crores for 1973-74 may rise at 4.8% to Tk.7,528 cr. in 1983-84, thereafter at 6.3% to Tk.13,962 cr. in 1993-94 and then taper off at 5.4% to Tk.19,143 cr. in 1999-2000, expressed in 1972-73 prices. Per capita GDP of Tk.616 for 1973-74 will double itself to Tk.1,214 at the turn of the century. In this scenario, during the 1st decade, agriculture should grow at 3% per annum and industry at 10.3% per annum (Annex 3). In 1983-84, industry will account for

13.4% of the GDP, rising to 29.3% in 1999-2000. Savings, investments, exports and imports calculations for this model indicate a resource gap of 4.5% of the GDP in 1973-74, 3.7% in 1983-84, 2.0% in 1993-94 and 1.4% in 1999-2000. The model used by Faaland and Parkinson (ref. Bangladesh, the Test Case for Development) assumes that the per capita GDP of \$80 for 1975 can be raised to \$174 in the year 2000, envisaging a higher rate of growth of the GDP (6% per annum), but this provides for much larger capital imports. Expressed in percentages of GDP, the capital imports needed would be 12% up to 1985, thereafter dropping to 10% in 1990, 8% in 1995 and 6% in 2000. The preliminary estimates of the Bangladesh Government indicate a need for about \$1.5 billion of foreign assistance per year on the average till the end of the century. Any of these estimates--and there may be many others like these which may approximate to the national aspirations for getting out of the poverty trap--awakens one to the stark reality of the dependence on foreign capital inflow, in spite of all the determination to follow economic discipline, sacrifice consumption, maximize domestic savings through an efficiently administered central planning, etc.

In the past, a multitude of factors like rocketing prices of imports from the developed countries, dwindling prices of traditional exports to markets affected by the recession, devastations caused by successive floods, unsatisfactory performance of the nationalized sectors of industry, etc., not only slowed down greatly the process of rehabilitation of war damages and economic recovery, but also steadily eroded the real income of the people, and hence the savings potential. The trade gap increased alarmingly, as shown below:

	<u>Taka crores</u>		
	<u>1973-74</u>	<u>1974-75</u>	<u>1975-76</u>
Exports	289.29	301.00	554.00
<u>Imports</u>	<u>740.00</u>	<u>1,178.10</u>	<u>1,821.20</u>
Trade Balance	-450.71	-877.10	-1,267.20

Since the birth of Bangladesh in December 1971 till 1975-76, it has received a total of \$3,016.67 million of external assistance of which roughly half was grant and half was loan. But this proportion gradually deteriorated, making the 1975-76 contribution only 29% grant and 71% loan as may be seen from the table opposite:

	<u>US\$ million</u>				
	<u>Dec. 71-72</u>	<u>1972-73</u>	<u>1973-74</u>	<u>1974-75</u>	<u>1975-76</u> <u>(Estimated)</u>
<u>A. Food Aid</u>					
Grant	113.29	175.79	122.64	192.10	14.37
<u>Loan</u>	<u>-</u>	<u>7.39</u>	<u>110.61</u>	<u>182.77</u>	<u>202.50</u>
Total:	113.29	183.18	233.25	374.87	216.87
<u>B. Commodity Aid</u>					
Grant	123.27	285.64	38.84	122.66	101.01
<u>Loan</u>	<u>-</u>	<u>5.91</u>	<u>70.53</u>	<u>277.06</u>	<u>277.13</u>
Total:	123.27	291.55	109.37	399.72	378.14
<u>C. Projects Aid</u>					
Grant	-	20.76	58.05	64.38	61.80
<u>Loan</u>	<u>6.80</u>	<u>63.27</u>	<u>80.04</u>	<u>80.80</u>	<u>97.26</u>
Total:	6.80	84.03	138.09	145.18	159.06
<u>Total Aid</u>					
Grant	236.56	482.19	219.53	379.14	237.18
<u>Loan</u>	<u>6.80</u>	<u>76.57</u>	<u>261.18</u>	<u>540.63</u>	<u>576.89</u>
Total:	243.36	558.76	480.71	919.77	814.07

The capital inflow referred to above filled both the savings gap and the foreign exchange gap during the past critical years, but kept the consumption level of the teeming millions very depressed. For a vast majority, it remained so depressed that there have been periods when there was not adequate fuel to water the scorched fields or light up the village homes at dusk; for want of cloth, the womenfolk in the countryside had to go half naked or there was no shroud to bury the dead; and thousands perished or languished for want of food. Fortunately, a better harvest, more efficient management of the economy and the return of discipline in all walks of life have changed all this. Internally, the country has made substantial progress in gearing itself to begin the steep climb towards the attainment of a self-sustaining level of economic development on a journey that may take a quarter of a century or so. But the rate of growth and the acceleration needed to achieve the goal will continue to remain a function of the external capital inflow.

Yet, what it will be possible to accomplish with external assistance, if available, will be governed by a variety of factors, the chief of which will be its character as dictated by the donor and the efficiency of its management depending on the recipient. The external assistance can be used either to offset the imbalance between the structure of demand and the structure of supply or to finance additional investments, supplementing domestic resources. The long-term productivity of the external aid has two aspects, one the initial increments in GNP it provides directly by increasing the availability of resources, and the other its indirect effects on growth resulting from the productive use made of the initial increments in GNP. With all the external assistance, the prospect of attaining a self-sustaining growth will be thwarted unless the economic structure is changed with careful planning, and unless efficiency is ensured in the use of both capital and human resources during the process of development and an appropriate climate for capital formation is maintained. Much will, of course, depend on the donor's willingness to cooperate. As of now, stemming from the general climate of aid distribution, the situation is very unsatisfactory and prospects are also rather bleak. As regards the quantum, the 1970 UN target for the developed nations to increase their contribution to the Official Development Assistance to 0.7% of their GNP has remained a far cry. Grants and loans on concessional terms available to the least developed countries are far from adequate. Too many restrictive conditions are attached to loans, and the tied nature of some of these aids, whether tied to a

specific source, a specific project or specific end use, makes a substantial part of the aid lose its value to the recipient and overcapitalizes his investments. Similarly, the compulsion to use the services of foreign consultants for certain projects at exorbitant costs also tends to become counter-productive. On the industrial front, all these matters assume serious proportions as their cumulative effects impair the marketability of the product and often defeat the very purpose of the external assistance.

The dependence of the industrial sector on foreign investment is not only for the import of capital goods and consumable stores, but also for the import of technology. Without going into the well-known controversies of capital-intensive versus labour-intensive technologies, it can be generally stated here that in the case of Bangladesh both will be necessary. Production of the average type of consumer goods for rural markets as well as for export and development of common rural industries will largely depend on labour-intensive simpler technologies requiring less skill and less investment. On the other hand, some heavier industries, production of primary and intermediate goods, etc., will call for capital-intensive efforts involving relatively more complex technologies. In cases where it is desired to achieve external economies and where international competitiveness has to be ensured with regard to both quality and price, there is no point in fighting shy of advanced technology or economy of scale within the dictates of the market. There will be many industries of this class such as production of cement based on local limestone, production of petrochemicals and fertilizer based on local natural gas, production of synthetic fibres based on imported oil, production of aluminium and steel based on imported ore, etc. Both in the heavier and the light class of industries, besides import substitution, a very large part of the production programme has to be export-oriented in order to narrow the gap in foreign exchange earning.

In the context of export-oriented industries, the role of foreign private investments and that of joint ventures assume prominence as they can not only provide the capital stock and technology but also bring in good management. Besides, private investment affords that flexibility of operation which makes it so much more valuable. In the earlier stages of growth, foreign investors may not be interested in investments for domestic markets in the developing countries, where demand is not so diversified and purchasing power is low, but this may not be true for products suitable for exports to markets of developed countries. Historically, foreign capital flow to Bangladesh from private sources, however, has been negligible. Prior

to liberation, there were 25 industries in Bangladesh in which there was foreign investment participation varying from 40% to 100% of the total investments. Of these, 12 were in the engineering sector, 1 in textiles, and 12 in chemicals, pharmaceuticals, food, leather, tobacco, etc. The sum total of investments in these was Taka 76.1 million. After liberation, out of a total of 1,152 units of private investments sanctioned, totalling an investment of Tk. 1,171.3 million, only 10 were foreign investments with a total of Tk. 459.9 million. The foreign ventures covered such fields as fishing, footwear, textiles and pharmaceuticals. There are also 14 other proposals for foreign investments under consideration. Besides, Bangladesh has received a satisfactory response from foreign private investments in ventures of an extractive nature like oil and gas exploration and appraisal, and a large number of foreign firms are already collaborating with the Government in these fields, while much of the traditional foreign interest in tea plantation has survived till today. However, the extent of foreign participation in industries ought to increase substantially.

From an economic point of view, both public and private capital flows perform identical functions and both are necessary and welcome in Bangladesh. Within the country the Government has adopted policies to encourage the private sector and it is hoped that foreign private investors will also be able to find satisfactory partners in the country. Against the background of scarcity and rising prices of fuel, expensive labour and restrictions imposed by environment control authorities in the advanced countries, Bangladesh today offers excellent opportunities for private foreign investments, particularly for the developed markets of the Western world: an abundant supply of good quality natural gas (over 9 trillion cub. ft. proven reserves and more finds are expected), cheap gas and electricity (gas price about 25 ¢ per million B.T.U., and electricity around 3 ¢ per kWh), reasonably well-developed physical infrastructure, peaceful and cheap labour (unskilled labour less than 8 ¢ per hour and skilled labour under 20 ¢ per hour) and an amazing propensity of labour for acquiring quickly new skills and techniques, considerable possibilities for manufacturing, assembling and processing a great variety of things for Western markets very competitively. For its part, the Government adopted a Revised Investment Policy in December 1975 (Annex 4) to encourage private investment in industries with the exception of 18 fields reserved for the public sector: defence equipment, atomic energy, jute, textiles (except handloom and specialized textiles), sugar, paper, steel,

shipbuilding, heavy electrical industries, minerals, oil and gas, petrochemicals, heavy chemicals, air transport, shipping (except under 1,000 dwt), telecommunications, electricity and mechanized forest extraction.

In consonance with the new investment policy, the following safeguards, concessions and conditions were extended to foreign investment in industries:

A. Capital Participation

1. The ceiling of private investment has been raised to Taka 100 million (the old ceiling was Tk. 30 million).
2. There is no rigidity about the proportion of Bangladeshi capital participation, though normally local equity is expected to meet the local expenditure.
3. Technical collaboration without equity participation is permitted.
4. The Government's agreement with OPIC (Overseas Private Investment Corporation) of USA provides protection for private US investment in Bangladesh.
5. Industrial financial institutions like Bangladesh Shilpa Bank and Bangladesh Shilpa Rin Sangstha have been revamped and provided with adequate resources. A new institution called the International Finance and Investment Company with 51% private and 49% public sector shares with provision for private investment in foreign currency has been established.
6. To improve the capital market, the stock exchange has been reactivated.

B. Repatriation Facilities

7. There is no restriction for the remittance of post-tax-paid dividends to the country from which the investment originated.
8. Foreign capital in approved industries may be repatriated at any time to the extent of the original investment.
9. Any part of profit ploughed back as investment is also eligible for repatriation.

10. There is no restriction on the remittance of royalties and technical fees.
11. 50% of net salary subject to a ceiling of £200 per month for any foreign national is allowed to be repatriated.
12. Savings, earnings, retirement benefits and personal assets of individual foreign nationals can be repatriated.
13. Employment of foreign nationals is permitted as necessary.

C. Payment of Compensation and Other Facilities

14. Foreign investments affected by nationalization of major sectors of industry in 1972 are to be paid fair compensation, cases of which are already under processing.
15. The Government has declared that it has no intention of nationalizing industries already in the private sector. Rather, 84 industries out of a total of 313 abandoned and nationalized units are being disinvested and others may follow.
16. Tax holiday for 5 years, provision for deferred payment of 50% customs duty for 6 years, a 5% rebate on customs duty, special incentives for areas outside 4 principal cities, etc., are all available.
17. Avoidance of double taxation is possible for investors from those countries with which the Government has agreements for such purpose.

Foreign private investment is permitted in any industrial field, but it is particularly welcome in export-oriented industries (except jute, sugar and textiles), engineering goods and appliances, in both the mechanical and electrical engineering category, basic chemicals, drugs, petrochemicals, metallurgical industries, etc. Foreign investors are also welcome to set up self-financing industry under the "pay as you earn" scheme. The Government is also studying the possibility of setting up Free Trade Processing Zones to facilitate the establishment of industries by private entrepreneurs for export purposes. For the convenience of prospective investors, the Government is providing centralized services through its newly set up Industrial Investment Information Centre.

It has been seen that industrial development will have to play a major role in the economic progress of Bangladesh, which is largely dependent on the availability of foreign capital and technology. Many of the industrial enterprises will have to be export-oriented. But what are the prospects of obtaining the necessary external assistance on favourable terms for this? Are the donors going to increase the quantum of aid flow to match the growing needs of the recipients, allowing for the erosion of value which it suffers? Or, for that matter, when are the developing countries' manufactured goods going to obtain free or preferential entry to the developed countries smoothly? The call for "global strategy for development" and the need for "convergent measures" by both developed and developing countries, so eloquently projected by Dr. Raul Prebisch in UNCTAD II at Delhi, have remained a distant cry. The subsequent UNCTADs at Santiago and Nairobi were equally disappointing to the Group of 77. The resolution for the contribution of 0.7% of the GNP by the developed nations has also not been fulfilled. Central to the vision of the "world interdependence" and "partnership for development" are matters concerning access to that market and aid. On both these counts, it must be stated with regret, the affluent countries have not done their share to ameliorate the conditions of the less fortunate peoples. In the words of Mr. McNamara, pronounced in Manila in October 1976, "the economies of these nations--already immensely productive--will become even more productive over the next few years. For them--or indeed for any of the other developed nations--increasing their help to the poorest countries would not require them to diminish in the slightest their own high standards of living, but only to devote a miniscule percentage of their additional per capita real income they will earn over the decade." To continue, "the industrial nations must find practical ways to assist by permitting more equitable access to their own markets, and by making available additional development capital on reasonable terms. All of this, too, is feasible, given a sense of fairness and realism. The dialogue over these issues within the international community is intense, but is often confused and ineffectual because of the tendency to prolong debate over peripheral questions, rather than come to terms first with what is clearly fundamental." The poorer countries keep on wondering why the developed countries do not do so before it is too late.

All this may seem too far away from the questions of patent legislations and WIPO, but, in the case of countries like Bangladesh, these are of such vital concern that mere revision of patent laws will not help the situation, unless simultaneously these fundamental issues are also resolved satisfactorily.

Having seen the need for industrialization and the need for bridging both the resource gap and the technology gap, I would like to turn to the question of the specific input of technology transfer for development processes and the legislations that affect it. The law concerning patents and designs in Bangladesh dates back to 1911, and although it does require revision--and here, I must add, Bangladesh will watch with interest what WIPO may have to recommend on this--patent laws by themselves have never been an impediment to technology transfer. The need for having proper patent laws has been clearly recognized, but it has to be borne in mind that future legislations will have to reckon fully with national aspirations while paving the way for smoother interchanges. Several relevant factors are worth noting in this context. It is not only the technical know-how that is important, but also of paramount importance are the acquisition of the skills to use the knowledge and the ability to ensure its actual application for productive purposes, that is, training and management. If they are to be purchased, they must not be attached to a price tag that is too high to make them of much use to the developing nations.

There ought to be proper recognition for inventive efforts, but there should be a distinction between individual and corporate efforts in this respect. Though, in theory, intellectual property, to the extent that it characterizes the creativity of the inventor, is invaluable, its commercial pricing cannot be done in the same way as for material property. Reasonable incentive payment to the individual inventor together with the acknowledgment of his contribution may often satisfy him, and that need not be prohibitive. In any case, the individual's invention is likely to be bought by larger companies for exploitation, in which case, he is likely to be adequately compensated for his efforts. In such cases the transfer of technology will take place through the companies acquiring them, rather than directly from the individual. But if disproportionately large shares of research and development costs incurred by the big companies are passed on to the recipients in developing countries in the form of licensing fees, royalties, etc., it may become crippling. Joint venture arrangements would be preferable

for transfer of technology and production, as this would permit more equitable sharing of the burden, for in that case both the parties would have to remain watchful. Competitiveness and market responses, therefore, tend to keep all costs as low as possible.

It is recognized that the inventor, whether individual or corporate, will have to be paid for the supply of the technology. But if its price becomes such that the cost of production in using that technology becomes excessive and intolerable, what can the poor recipient country do about it? Either it cannot buy the technology for want of the resources required or what it produces will remain unsold. The recipient would obviously need a financier to pay for such high-priced and not necessarily high-cost technology, and this financier may be a bilateral or a multilateral source from which the beneficiary country is receiving external aid. A compromise answer to the dilemma between the price charged by the exporter of the technology in the developed country and the inability of the importer in the developing country may be found if the donor governments would be willing to pick up themselves the cost of technology, to the extent that the research and development costs are not already reflected in the acceptable price of the plant and machinery being sold, and pass on the benefits to the recipient governments as grants in the same way as other technical assistance provided as grants. In this context, it stands to reason that products concerning basic human needs should receive more favourable treatment in the matter of pricing for technology than for products for sophisticated consumption.

[Annexes follow]

GDP of Bangladesh at Constant Prices for 1972-73

BD Taka million

Sectors	1969/70	1972/73	1973/74	1974/75	1975/76 (Estimated)
1. Agriculture	31,836 (61.42%)	27,220 (60.01%)	30,307 (61.09%)	29,701 (58.79%)	33,291 (59.21%)
2. Industry	4,281 (8.26%)	3,298 (7.28%)	3,784 (7.63%)	3,735 (7.39%)	3,924 (6.98%)
3. Construction	2,377 (4.58%)	1,444 (3.18%)	744 (1.50%)	1,776 (3.52%)	2,090 (3.72%)
4. Power & Gas	124 (0.24%)	185 (0.41%)	259 (0.52%)	265 (0.52%)	315 (0.56%)
5. Transport Service	2,399 (4.63%)	2,399 (5.30%)	2,615 (5.27%)	2,615 (5.18%)	2,981 (5.30%)
6. Trade Service	3,864 (7.45%)	3,513 (7.75%)	3,924 (7.91%)	3,924 (7.77%)	4,473 (7.96%)
7. Housing Service	2,293 (4.42%)	2,360 (5.21%)	2,426 (4.89%)	2,494 (4.94%)	2,594 (4.61%)
8. Public Administration	1,263 (2.45%)	1,321 (2.92%)	1,945 (3.93%)	2,462 (4.87%)	2,757 (4.90%)
9. Banking & Insurance	258 (0.50%)	328 (0.72%)	338 (0.68%)	349 (0.69%)	370 (0.66%)
10. Professional Services	3,138 (6.05%)	3,232 (7.14%)	3,264 (6.58%)	3,297 (6.53%)	3,429 (6.10%)
G D P	51,833 (100%)	45,300 (100%)	49,606 (100%)	50,518 (100%)	56,224 (100%)
GDP Growth %	-	-12.60	9.5	1.84	11.3
Population (million)	69.00	74.00	76.22	78.51	80.87
Per Capita Income (Tk.)	749	612	650	643	695
GDP Deflator (Tentative)	0.43	1.00	1.30	1.70	1.60

Statistics of Some Manufacturing Industries

Industrial Group	No. of Establishment	No. of Employees	Fixed Assets in 1970-71 Tk. million	Value added in 1970-71 Tk. million	Value added in 1974-75 Tk. million
1. Food Manufacturing	216	22,540	228.26	234.35	429.09
2. Beverage	7	587	6.22	11.26	40.25
3. Tobacco	27	4,835	52.51	148.50	978.78
4. Textiles	526	189,943	154.60	748.97	1,465.03
5. Footwear, wearing apparel & made up textiles	104	1,548	5.33	4.96	18.26
6. Wood & Cork	2	18	0.02	0.06	1.40
7. Furniture & Fixtures	31	577	3.57	1.56	4.17
8. Paper & paper products	16	2,245	159.79	20.97	50.62
9. Printing & allied industries	106	2,643	11.80	8.82	20.81
10. Leather & leather products	98	2,193	9.23	13.77	29.43
11. Rubber products	1	29	0.14	0.06	0.03
12. Chemical & chemical products	263	15,879	94.28	133.15	411.94
13. Petroleum products	1	391	109.39	17.00	8.40
14. Non-metallic mineral	33	2,790	28.62	16.39	33.87
15. Basic metal	27	2,475	47.74	18.51	165.91
16. Manufacturing of metal products except machinery	114	3,902	13.31	7.78	44.49
17. Manufacturing of machinery except electrical	54	1,924	8.39	16.14	20.89
18. Electrical machinery & apparatus	16	1,399	11.71	2.88	18.95
19. Transport equipment	19	763	4.07	20.91	37.33
20. Miscellaneous manufacture	66	2,011	28.11	40.51	9.30
Total:	1,727	258,692	2,368.49	1,531.39	3,789.96

Annex 3

Macro-Economic Scenario
Taka Crores (10 million)
at 1972-73 prices

<u>A. By Expenditure Category</u>	<u>1973/74</u>	<u>1983/84</u>	<u>1993/94</u>	<u>1999/2000</u>
1. Consumption	4,675	6,705	11,939	16,466
2. Investment	248	1,101	2,303	2,948
3. Exports	262	389	661	937
4. Imports	-473	-667	-941	-1,209
5. GDP	4,712	7,528	13,962	19,143
6. Population (million)	77	104	137	158
7. GDP/Capita (Taka)	616	724	1,021	1,214
<u>B. By Sectors</u>				
1. Agriculture	3,030	4,067	5,716	6,657
2. (a) foodgrains	(1,696)	(2,477)	(3,576)	(4,105)
(b) others	(1,334)	(1,590)	(2,140)	(2,552)
3. Industry	378	1,008	3,356	5,608
4. Other Sectors	<u>1,303</u>	<u>2,452</u>	<u>4,890</u>	<u>6,376</u>
	4,711	7,527	13,962	18,641
<u>C. Rate of Growth (% per annum)</u>				
1. GDP	-	4.8	6.3	5.4
2. GDP/Capita	-	1.7	3.5	3.0
3. Foodgrain Agriculture	-	3.9	3.7	2.4
4. Other Agriculture	-	1.8	3.0	3.0
5. Total Agriculture	-	3.0	3.5	2.6
6. Industry	-	10.3	12.8	8.9
7. Other Sectors	-	6.5	7.1	5.9
<u>D. Ratio (% of GDP)</u>				
1. Savings	0.8	10.9	14.5	14.0
2. Investment	5.3	14.6	16.5	15.4
3. Exports	5.5	5.2	4.7	4.9
4. Imports	10.0	8.9	6.7	6.3
5. Resource Gap	4.5	3.7	2.0	1.4
6. Agriculture	64.3	54.0	40.9	34.8
7. Industry	8.0	13.4	24.0	29.3

Annex 4REVISED INVESTMENT POLICY
(December 7, 1975)

The New Industrial Investment Policy which was announced in July 1974 has been reviewed by the Government. This review became necessary because of the experience of the last one and half years, the higher cost of investments and the inadequate response of the private sector. With a view to accelerating economic activities and industrial investment in the country, particularly in the private sector, the Government has revised the New Investment Policy.

The Government is of the opinion that while industries of basic and strategic importance or in the nature of public utility services should remain in the public sector, in order to reach the goal of mobilization of investment funds and rapid industrialization, private entrepreneurs should be afforded adequate scope and facilities for setting up industrial enterprises within the broad framework of a planned economy, the provisions of the Constitution and the laws of the land, and efforts should be made to consolidate and improve the efficiency of the public sector.

Schedule of Industries

Industries reserved for the public sector (Schedule A of the New Investment Policy*) will remain intact. For the private sector there will be an Industrial Investment Schedule which will be issued from time to time.

Sector Corporations may set up industries falling within the reserved list but with the exception of (i) jute (sacking, hessian and carpet backing), (ii) textiles (excluding handlooms and specialized textiles), (iii) sugar, (iv) arms and ammunition and allied defence equipment, (v) atomic energy, (vi) air transport, (vii) telephone, telephone cables, telegraph and wireless apparatus (excluding radio receiving sets), and (viii) generation and distribution of electricity, in collaboration with the private sector, both foreign and local, and with corporations retaining majority shares but, for considerations

* The New Investment Policy declared on July 16, 1974, is appended to Annex 4.

Annex 4, page 2

of economy, technology and management, management contracts may be allowed to private investors, wherever feasible.

Ceiling on Investment in the Private Sector

In view of higher investment costs, the ceiling on private sector investment has been raised from Taka 3 crores to Taka 10 crores.

Moratorium on Nationalization

In view of the misgivings that have been created in the minds of investors by the reference in the New Investment Policy to the moratorium on nationalization for a period of 15 years, this provision has been deleted. However, it is reiterated that, if any industry is ever nationalized, compensation will be paid on a fair and equitable basis.

Tax Holiday and other Incentives

In addition to tax holiday and other incentives already provided in the New Investment Policy, a further incentive that is provided is that electricity may be made available to selected industries at a preferential rate in the less developed areas of the country for the growth of industries in those places.

Equity Support to Industries

Industrial financing institutions, particularly the Bangladesh Shilpa Bank, have been directed to provide equity support in deserving cases to small industries, particularly agro-based, agro-supporting and export-oriented industries.

Re-activation of Capital Market/Stock Exchange

To mobilize private savings and channel them into industrial investments, the stock exchange will be re-activated. The question of the re-creation of the National Investment Trust and Investment Corporation of Bangladesh will be examined and the necessary steps will be taken in the matter.

With a view to bringing the unused, idle funds into the productive stream and mobilizing investment funds for investments or the purchase of disinvested units, it is provided that those who disclose such funds will be allowed to retain the same without any questioning by the Government, provided such funds are used for new investments or the purchase of disinvested units. This facility will be available up to June 30, 1976, but for investment purposes the period will extend up to June 30, 1978. The details of how the funds will be declared and deposited in banks, etc., will be announced by the Ministry of Finance.

Cases to be Referred to the Investment Board

New investments processed by the Bangladesh Shilpa Bank and the Bangladesh Shilpa Rin Sangstha in the private sector involving a loan of more than Taka 1 crore, either in foreign exchange or in local currency or both, or where the import liability is more than 20% of total raw material requirements (regardless of the amount of the loan), will require the approval of the Investment Board. Similarly, cases of new investments sponsored by the Bangladesh Small Industries Corporation where the total loan either in foreign exchange or in local currency or both exceeds Taka 10 lakhs, or where the import liability is more than 20% of the total raw material requirements (regardless of the amount of the loan), will also require the approval of the Investment Board.

With a view to allowing the sector corporations to improve efficiency of management, some industrial units under their control which were declared abandoned and handed over to them for management will be disinvested to Bangladesh entrepreneurs on payment of cash. Persons receiving compensation under the President's Order No.27 will be allowed to adjust their compensation money against the sale price of such disinvested units. Detailed procedure in this regard will be issued by the Ministry of Industries.

Other provisions in the New Investment Policy, to the extent that they have not been amended or revised heretofore, will be in force.

[Appendix follows]

Appendix

NEW INVESTMENT POLICY

1. The Industrial Investment Policy announced in January 1973 under which the Industrial Investment Schedule was issued in August 1973 has been reviewed recently, particularly with regard to industrial activities and investment in the various industrial sectors. In the context of this review, the Government has decided to revise the Industrial Investment Policy.

2. The new investment policy has been created bearing in mind the following principles:

(i) In pursuance of the Government's commitment to the establishment of a Socialist economy, the key sectors including the bulk of the industries are already in the public sector. All industries of basic and strategic importance, or in the nature of public utility services, will remain exclusively in the public sector. It is, however, considered conducive to the goal of rapid industrialization and mobilization of investment funds to afford scope to private entrepreneurs to play an expanded role within the framework of a planned economy.

(ii) While the public sector will be consolidated, the private sector will be provided with opportunities for investment in a large number of industries within the plan framework.

(iii) With the development of the basic infrastructure and service facilities, such as power, transport, communication and credit, industries are to be dispersed all over the country, particularly outside the industrially developed areas of Dacca, Chittagong and Khulna.

(iv) Particular emphasis needs to be given to labour-intensive small and medium size industries for the creation of employment opportunities and the production of essential commodities within the country.

(v) Foreign participation both in management and equity will be allowed mainly in projects where a technological and managerial gap exists and which are considered necessary in the national interest.

Appendix, page 2Schedule of Industries

3. In consideration of the above principles, the industries which will be reserved for the public sector have been listed and are shown in Schedule A.* All other industries not included in Schedule A will be in the private sector. The Comprehensive Industrial Investment Schedule for the private sector issued in August 1973 will be revised and a new Schedule for the private sector indicating sectoral priorities, etc., will be issued soon by the Ministry of Industries.

4. The Government may undertake any type of industry included in the private sector if it is considered necessary. Industrial enterprises already under the management of government corporations/agencies will continue to remain with them.

Ceiling on Investment in the Private Sector

5. In view of the high increases in the prices of land, building and machineries for setting up any sizeable industry and offering an expanded scope for investment in the private sector, the present ceiling on private sector investment will be raised to Taka 3 crores.

Foreign Private Investment

6. Foreign private investment will be permitted in collaboration with both government and local entrepreneurs. In the private sector, foreign equity participation will be limited to those industries where technical know-how is not locally available, technology involved is very complicated and capital outlay is high, and to industries based on local raw materials or wholly export-oriented industries.

7. Technical collaboration without equity participation may be allowed in all types of industries.

8. In the case of new investments, foreign collaborators should generally provide the entire amount of the foreign exchange component of the project as equity capital. The terms and conditions determining equity participation and the precise nature of association, including the management contract in individual cases, will, however, be subject to negotiation.

* Attached to this Appendix.

Appendix, page 3

9. All foreign investment projects will require the approval of the Investment Board.

Remittance Facilities to Foreign Investors

10. Foreign companies will be allowed the following remittances:

- (i) all post-tax dividends on foreign capital;
- (ii) 50% of the net salary of foreign nationals subject to a maximum £200 per month per individual;
- (iii) savings from earnings, retirement benefits and personal assets of individuals on retirement/termination of service.

11. Repatriation of foreign capital, including capital gains and reinvestment out of profits within the first 10 years from the commencement of production, would have to be spread over a period of 10 years.

12. Protection against double taxation, where such agreements are signed between Bangladesh and the private investor's country of origin, will also be given.

Moratorium on Nationalization

13. There will be a moratorium on nationalization for a period of 15 years from the date of the unit's going into production. In the event of nationalization of any industry after this period, compensation will be paid on a fair and equitable basis.

Tax Holiday and Other Incentives

14. The present provision of tax holiday and other incentives, such as, rebate of customs duty, deferred payment of 50%, customs duty on machinery, etc., will continue. With a view to encouraging industrial activities in industrially backward areas outside the industrial zones of Dacca, Chittagong and Khulna, tax holiday will be given for a period of up to 7 years. Policies regarding the "Pay As You Earn Scheme," supplier's credit and investment

Appendix, page 4

by overseas Bangladesh will continue. The necessary institutional arrangements for mobilizing private savings for investment in industries will be made. Detailed instructions and clarifications in this regard will be issued by the Ministry of Industries.

Cases to be Referred to the Investment Board

15. New investments in the private sector costing more than Taka 25 lakhs or where the import liability is more than 20% of the total raw materials requirement will require the approval of the Investment Board.

[Schedule A follows]

SCHEDULE A

Industries Reserved for the Public Sector

1. Arms and ammunition and allied defence equipment.
2. Atomic energy.
3. Jute industry (sacking, hessian and carpet backing).
4. Textiles (excluding handlooms and specialized textiles).
5. Sugar.
6. Paper and newsprint.
7. Iron and steel (excluding re-rolling mills and mini-billet mills).
8. Shipbuilding and heavy engineering (including machine tools and assembly/manufacture of cars, buses, trucks, tractors and power tillers).
9. Heavy electrical industry.
10. Minerals, oil and gas.
11. Cement.
12. Petro-chemicals (fertilizers, PVC, ethylene and synthetic fibre).
13. Heavy and basic chemicals and basic pharmaceuticals.
14. Air transport.
15. Shipping (including coastal ships and tankers above DWT).
16. Telephone, telephone cables, telegraph and wireless apparatus (excluding radio, receiving sets).
17. Generation and distribution of electricity.
18. Forest extraction (mechanized).

PATENT PROTECTION AS AN EFFICIENT MEANS FOR ESTABLISHING AND
DEVELOPING A NATIONAL PHARMACEUTICAL INDUSTRY

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In our time, there is not a single person either among the qualified professionals or in the general public who could not pass severe judgement on the old, classical system of granting only exclusive patents for inventions. I am not satisfied either with this obsolete system since it does not fit properly into our present world, which has undergone considerable changes, most of which have a positive character.

In spite of my dissatisfaction with the old system of exclusive patent protection, in my personal opinion, the legal institution of patent protection should not be abolished but adjusted to the requirements of our modern times.

My opinion expressed in this paper is strictly personal and cannot be considered absolutely objective, primarily because of its personal character and, secondly, because of the fact that not only have I worked for 31 years in the pharmaceutical field--my practical knowledge being based on the experience collected there--but I am fond of this branch of industry and of my own profession, too.

Every government, be it that of a Socialist, a developing or a capitalist country, is seriously concerned to satisfy the drug demand of its country and thereby ensure an acceptable level of public health. In some countries, the drug supply is really a "life-and-death" question, to be solved by any means. Since this problem affects the welfare of practically the whole country, it is not only of economic but also of a very high political importance. No country and no government has any intention of covering the whole drug demand by importation and they all strive to establish local manufacture of the most important medicines.

In the middle of the 19th century, my country, Hungary, was an agricultural country with only slight traces of industrial development based mainly on the processing of agricultural products. The structure of society was a feudalistic one where a minor part of the population--the nobility--owned almost all the landed estates and the major part of the nation--the peasants--owned almost no land. Let us say, my country's situation at that time was worse than that of the major part of the developing countries today.

Under these circumstances, ardent patriots were working towards a better future for the country and her population. One of them was a pharmacist and chemist, Dr. WAGNER, who from 1833 onwards deployed considerable activity to find partners for the establishment of the first national drug manufacturing company in Hungary.

That the task was not an easy one is proved by the fact that he succeeded only in 1867, when he and his associates--mainly physicians and pharmacists, many of them university or medical school professors--inaugurated the First Hungarian Institute for Pharmacy and Chemistry, Ltd., in Budapest.

In the first few years, they had some financial success by introducing on to the market some of the pharmacopoeia compositions previously prepared on a small scale by pharmacies. Later on, the new company suffered losses in competition with German and Austrian companies which were scientifically, technologically and also financially more powerful. The first Hungarian drug manufacturing company had to discontinue its activities and sell the production plant, to be used for other purposes, in the eighties of the last century but, de jure, it existed until 1912, when it was struck off the company register. It is important to mention that during the active period of this pioneer national drug company no Patents Act was in force in Hungary; only some ambiguous regulations of Austrian origin were in operation. Here, it has to be said in passing that the practical lack of patent protection did nothing to promote the establishment and strengthening of a national pharmaceutical industry.

In Hungary, pharmaceutical research in the modern sense dates back to the eighties of the last century, shortly before the start of the overall industrialization interrupted by the outbreak of the First World War. Necessitated by the establishment and development of national industry, the first Hungarian Patents Act was passed by Parliament in 1895 and entered into force on January 1, 1896. This Act had a 74-year span of life until it was replaced by a new Patents Act on January 1, 1970.

In the pharmaceutical industry, which was highly research-based even at the beginning of this century, the protection of inventions is of special importance. The different roles attributed in general to the patent are as follows:

it stimulates research activity,

it renders possible the recuperation and re-use of the extremely high research and development (R&D) expenses,

by its publication it disseminates technical knowledge,
and

it stimulates further capital investments.

We shall not investigate now which of these roles, and to what extent, has a real and incontestable value in the pharmaceutical field. The importance of patents in this respect is shown by the mere fact that the Hungarian pharmacist, Gedeon RICHTER, who had established in 1901 in Budapest the first national drug manufacturing company with a really long-lived activity (Chemical Works of Gedeon Richter, Ltd., which not only still exists today but is the largest of the eight Hungarian drug companies), achieved his first important business success by putting the first preparations containing adrenaline on the market, under his own patents and patent applications, in 1902 within only one year of the discovery of this new hormone. Just before the First World War, two other new drug companies were established: CHINOIN (1910) and EGYT (1912), which still exist today and operate as large companies. The subsequent Hungarian drug company was established in 1927 under the name of ALKALOIDA, based exclusively on patents granted to pharmacist Janos KABAY for a process for the manufacture of morphine and other alkaloids from poppy straw.

The fact that the Hungarian pharmaceutical industry began with the exportation of its products only a few years after the establishment of the first national company at the turn of this century may be considered noteworthy. The trade balance of Hungary in pharmaceutical and related products became positive in 1929, that is, exportation exceeded importation, and since then an increasing export surplus has been continuously maintained. This surplus is mainly due to new processes developed by our own research staff and protected by valid patents.

Since its establishment, the Hungarian pharmaceutical industry has displayed a strong and ever-increasing R&D activity. Because of research achievements, not only was it possible to supply the home and export markets with new products but as a result Hungarian companies became capable of establishing subsidiaries--mainly in the neighboring countries--to manufacture those same products.

Before the Second World War, outstanding research achievements stimulated further developments, e.g., new sulpha drugs, glycosides, alkaloids, diuretics and other medicines.

After the Second World War, in 1948, the Hungarian pharmaceutical industry was nationalized and its Socialist era of spectacular development could start. Nowadays, it consists of eight large companies and two central research institutes employing a staff of 24,000. The yearly turnover amounts to 600 million US dollars, 70 % of which derives from exportation. Drugs rank fifth among the groups of products which yield the greatest export income for Hungary and thus 6% of the country's total exportation consists of drugs. In the pharmaceutical industry, the total R&D staff consists of 2,800 persons and 120 different institutes of the Hungarian Academy of Sciences, universities and medical schools regularly carry out drug research on a contractual basis.

The foregoing could be taken as a case history: how to bring about the establishment and spectacular development of the national pharmaceutical industry in a country which a little over a hundred years ago had been in a considerably worse situation than some of the developing countries today.

What were the main factors in this development? First and foremost, the human beings: researchers, engineers and technicians, production workers, clerical staff and salesmen. Another decisive factor of growth was the assistance of the Government in two crucial stages: before the First World War, in the stage of establishment, and after the Second World War and nationalization, in the postwar reconstruction and foundation of the most dynamic era of development. The third important factor in this development was the never-ceasing and constantly increasing and improving R&D activity, as a consequence of which the patent protection problem arose. The latter, together with other institutions of industrial property protection, is also of importance in trade activity.

I have already mentioned that the pharmaceutical industry was considerably research-based. In research work there is always a certain risk, which is usually rather high. It is incontestable that the difficulty of finding a new and potent drug is constantly increasing. Some 20 years ago, from 3,000 new compounds synthesized and pharmacologically and clinically tested only one could be introduced as a medicine in therapy. Nowadays, this ratio has changed to between 8,000 and 10,000 to 1. In view of the thalidomide (CONTERGAN) catastrophe, the regulations on drug safety became extremely severe, resulting in the prolongation of the time needed for testing and a rise in expenses. Today, a successfully accomplished drug research campaign takes some 6 to 10 years and expenses amount to between 10 and 15 million US dollars for each new drug. These data clearly show the magnitude of the risk involved. At this order of magnitude, the small or medium-size companies have to face the danger of being excluded in advance from this innovative activity. In practice, this apprehension is not fully borne out since

(i) the smaller companies can carry out R&D in coordinated joint action,

(ii) there is a factor in research, called "luck," which can also help these companies.

How can someone who invests money in R&D be given a guarantee that he will recover it fully or partly without a patent system? I suppose that, in the absence of such a protection, companies engaged in research work would keep the results secret, retaining thereby certain advantages for themselves but retarding the scientific and technical progress of mankind.

A national pharmaceutical industry could perhaps be established on the basis of copying the research results of others but it would take a longer time. However, after having achieved a certain importance through development, the industry will need its own original research work. As the results of this original research increase in number and importance, some efficient protection system for inventions is required. This demand becomes more imperative when one has more to lose by not protecting one's own research achievements than to gain by not granting protection to others.

In my own personal opinion and from the standpoint of the pharmaceutical industry, a properly operated protection system could be very useful even in its establishment phase. Later on, at a higher stage of development, it is imperative to ensure efficient protection and, if more than one form of this is used, full freedom should be given to the applicant in choosing between them. When it is intended to introduce some kind of limitation,

a system should be provided for which would be analogous to the one stipulated in Section 46 of the British Patents Act of 1949, although with a suitable modification of the wording.

Once the pharmaceutical industry is well developed, the idea may occur of introducing product protection for drugs in addition to process protection. In Hungary, in spite of having a well-developed pharmaceutical industry, this solution is not yet applied and it is not to be expected in the near future.

Since the research work is carried out by human beings, their stimulation both by moral acknowledgement and by remuneration must be taken into consideration. The lack of such a stimulation can considerably reduce the creativity of researchers. In Hungary, the notion of "employee's invention" was introduced by the first Patents Act of 1895. After the Second World War, this institution was further developed and not only the rules of moral acknowledgement but also those of remuneration were clearly formulated and implemented. The obligation of the employer to pay an appropriate remuneration to the employee having made a patentable invention is compulsory in Socialist countries but similar regulations also exist in some other countries such as the Federal Republic of Germany and Austria. A proper stimulation renders the inventive activity mainly self-generating, which could not be achieved without patent protection when inventors are hidden in the darkness of anonymity.

In discussing this particular topic, a delicate question which should be touched upon is whether development should be based on one's own research work or partly on purchased licenses and know-how. In my personal opinion, the truth is that no country in the world, even the largest and best developed, can be self-sufficient in drug research. Each country has to have a specialization and concentrate its research efforts. In this way a lively exchange of scientific and technical knowledge must be achieved. This worldwide exchange of experience is controlled not only by purely economic but also by legal factors, among which those connected with industrial property protection are of considerable importance. On the basis of feasibility studies, it could be stated that in most cases the purchase of technological knowledge under fair and reasonable conditions costs less than achieving the same result by one's own R&D activity, not to mention the considerable difference in the time needed. Sometimes--even if one's own R&D capacity is available--it is more feasible to lay the foundations of a new kind of manufacture by purchasing technical knowledge and using one's own research staff for its further development. In the course of the development of the Hungarian pharmaceutical industry, we had the opportunity to try out and evaluate both ways. After the Second World War, when no foreign

partner wished to sell us licenses or know-how, we were compelled to be self-sufficient. At the end of the fifties, we started purchasing technical knowledge and in the last 10 to 15 years we have been steadily participating in this activity, in a well-planned and coordinated way, in order to concentrate our research efforts on other tasks. As an aside it may be mentioned that 5 years ago the trade balance of our branch in received and paid out royalties became positive in the sense that it has an excess on the income side.

A country's endeavors to reach self-sufficiency in pharmaceutical research, production and supply can be set as an aim, but, even if it could be sufficiently accomplished, it would lead economically, in all probability, to financial losses. For all of us it is advisable to rely upon a thorough international division of labor and upon well-developed world trade to achieve better living standards, by achieving higher economic efficiency in our own country. If a logical demand for such a practice prevails, the rules of the game should be laid down using proper and internationally valid legal regulations. Among these regulations those on industrial property protection and especially on patent protection play a not unimportant role.

Patent protection is often criticized as being one of the reasons for extremely high drug prices. This criticism could be fully valid for a country where exclusive patent protection is granted and the State does not exercise any direct or indirect control of drug prices. On the contrary, where the State exercises a proper control of drug prices, the drug price index is lower than price indexes of other goods and facilities. Let us quote the example of France, where the price indexes, based on 1960 as being equal to 100, were as follows in 1975:

<u>Drugs</u>	<u>135</u>
Agricultural products	210
Industrial goods	211
Clothing	219
Average of the economy	232
Investments	233
Food	241
Cleaning articles	241
Transport and communication	243
Construction	290
Services in average	303
Gold	344
Wages	522

It is surprising, indeed, how low the above-mentioned drug price index can be, thanks to well-established State control and "in spite of" an existing efficient patent protection system.

My own experience with the patent system, limited to the field of the pharmaceutical industry, shows a positive balance in the final evaluation as concerns its role in stimulating R&D activity and thereby the dynamic development of this branch. It is obvious, of course, that this efficient instrument has to be used deliberately and has to be adjusted from time to time to the current requirements of the national economy.

SOME CONSIDERATIONS ON PATENT RIGHTS
AND
ASPECTS OF THE TRANSFER OF TECHNOLOGY

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Having already heard so much about the patent systems of so many developing countries and the way they work, I should like to begin my talk by expressing the views of my company, Philips, an electronics firm, on the importance of the patent system in general. We think this lies in faster publication and divulgence of the invention and the technical knowledge incorporated in the patent application. It is clear that, without the patent system as we know it today, bright ideas and inventions would be published and brought to the knowledge of interested parties much later than is the case under the present system, whereby patent applications are published relatively soon after new discoveries have been made. In this way, a better insight is obtained into the innovative strength of individuals and companies throughout the world. Moreover, the fact that a person can secure protection for his invention stimulates investment in research (Annex 1).*

Regarding the use of patent rights, our main interest is in using the patent rights filed and obtained by us in order to acquire and maintain our own freedom of operation. Furthermore, we are, in principle, prepared to license interested parties under our patent rights against reasonable remuneration.

In the electronics industry--as distinct perhaps from other industries--nobody can operate without making use of his competitors' patent rights, with the result that nearly every company is willing to license other parties, generally

* The Annexes to this lecture appear at the end of the text.

under reasonable conditions (Annex 2). Small inventive companies with a small production of their own can afford to be more aggressive than big undertakings because the latter are much more vulnerable on account of their big turnover. Therefore, they are much more sensitive to any counteraction. This vulnerability may be determined approximately by the ratio between turnover and patentable inventiveness.

These days, multinational enterprises in particular are reproached by some people who claim that these companies apply for a great number of patent rights in the developing countries which they then do not use locally and thus impede the development of local industry.

If you look for a moment at the WIPO statistics for 1974, which are well known to you, you will see the relationship which exists between patent applications filed by nationals and patent applications filed by foreigners in some of the more industrialized developing countries such as Argentina, Brazil and India (Annex 3). But if you look for a moment at the same WIPO statistics for a number of industrialized countries, you will see that, in these countries, the ratio between national and foreign patent applications is similar to or even smaller than that in countries such as Argentina, Brazil and India. It is only in some countries such as Japan, the USA and Germany that you will find a larger percentage of national patent applications (Annex 4).

This leads to the conclusion that the position in industrialized--developing and developed--countries is comparable.

Where do companies stand in this matter? With respect to my own company, I can tell you that the number of patent rights applied for in more industrialized countries such as Argentina, Brazil, India and Mexico represents 3% of the total number of Philips patent rights (Annex 5). The total number of Philips patent rights in other developing countries is only 1% of the total number of patent rights held by Philips (Annex 6).

From these figures it can easily be concluded that the importance of patent rights in developing countries should not be over-estimated, at least not as far as my company is concerned. The mere fact that we have industries in many developing countries does not in itself lead to the filing of patent applications. I am reasonably certain that other electronics industries are in the same position.

Another point which I should like to make in this connection is that, while it is so easy to speak about developing countries in general, we all know that there is a very big difference between the poorer developing countries, the oil-producing countries and those countries which have a large home market and are more advanced in their economic and technical infrastructure and, consequently, are at a more advanced stage of industrialization. It is self-evident that the importance of the patent system for the latter category of so-called developing countries is relatively greater, as I have already illustrated with respect to the number of patent rights applied for by Philips in those countries.

In those more industrialized countries, the manufacture of products creates the need for development activities and improvements to such products. Improvement patents and valuable contributions to product improvement may result from such development. Patent rights do not always have to be of a sophisticated nature, but may provide, in a simple way, solutions to technical problems which have not previously been recognized as such. Research may follow when a certain stage of development activities has been reached and experts are available. It is then that the processes of innovation and invention start. Thus, industrial activities may lead to innovation, to inventiveness and to research and development activities. Therefore, industry should be properly remunerated for its stimulation of creativity.

To summarize the importance of the patent system in developing countries with regard to the electronics industry, I would say that:

1. the patent system is and will continue to be important in the more industrialized developing countries;
2. patent rights are, in our view, unimportant in the promotion and implantation of new electronics industries;
3. transfer of technology will take place and will be implemented independently of the existence of patent rights (Annex 7). It is therefore more or less an activity in its own right, determined by factors other than the patent system.

Having said this, I should like to turn to the second chapter of my talk and deal with some aspects of the transfer of technology and the experience my company has had in this connection over a period of many years and in many developing countries.

On the basis of this experience, the world can be roughly divided into five groups of countries, according to an increasing degree of difficulty and risk in the process of transferring technology (Annex 8).

The first group is the Benelux countries, where the headquarters of Philips are located. Therefore, all the required know-how exists in the Benelux and nearby areas, from research to marketing. There is practically no language problem, distances are very small and it is therefore not surprising that most of the basic research and a considerable part of the applied research are done in this area. Moreover, many specific manufacturing processes, requiring expertise and tight control, are organized there.

The second group consists of the industrialized countries of Western Europe, where national Philips organizations exist with a great deal of experience. There may be some language difficulties, but, because the criteria by which industrial operations are judged are the same, there are only small additional problems.

The third group consists of industrialized countries outside Europe. The industrial climate in this category of countries is comparable with that of Europe, but distances make the transfer of know-how time-consuming and more expensive. Moreover, these countries often lie within the sphere of influence of large industrial countries with different industrial technologies. (To take an example: American and European television picture tubes are not interchangeable, and Canada applies United States technologies and standards.) Consequently, in these countries, some technological adaptation to local circumstances is unavoidable.

The fourth group comprises countries--classified as developing countries by the United Nations--that have a manufacturing industry of considerable size. In these countries, some of which have a sizeable home market, infrastructure and ancillary industries exist. Moreover, there are skilled people there. Nevertheless, the transfer of know-how is faced with a number of special complications, especially when national production of parts and materials is pushed further than is justifiable from the point of view of cost and efficiency.

The fifth group is that of the developing countries with a limited industrial background. These countries have all the problems of the fourth group and, in addition, the handicap of a small home market. Any company set up here can only produce small series and will consequently have to struggle against high unit costs. As a general rule, the infrastructure and local supply industries are only slightly developed, so that very few parts can be bought locally, except when the firm takes the time and trouble and accepts the cost of helping to set up such local industries, which later on will be able to act as subcontractors. In addition to this, there is a great shortage of persons with the proper training and industrial experience. Consequently, the transfer of know-how to industries in these countries demands special attention and effort. The watchword for those transferring know-how to these countries is simplification and scaling down.

It is self-evident that this situation is still developing and is liable to change, so that countries which have now been mentioned as belonging to the fifth group could move on to the fourth group, and so on.

Now, when talking about know-how and its transfer, what do we mean precisely and what are its contents? We mean not only technical or industrial know-how, but also many other things in relation to organization, planning, management, etc. First of all, we can distinguish between general industrial know-how, product know-how and manufacturing know-how. General industrial know-how can best be acquired by training people on the spot, where things are happening, because it is on the shop floor that it becomes apparent that discipline, tidiness, proper supplies and planning are vitally important to an industry.

The product know-how to be transferred is related to the products for which the techniques have been developed. Without a knowledge of the product, its manufacture is inconceivable. This product-related knowledge has various aspects, including the way the product works, its specifications, quality requirements and reliability. Furthermore, it will be necessary, in order to obtain product knowledge of electronic articles, to have a fair understanding of electronics (radio and/or television techniques).

In addition to product knowledge, it will also be necessary to transfer know-how related to manufacturing.

This includes knowledge of the tools, measuring equipment and testing equipment used. Here, too, it is necessary to have a good understanding of certain processes that play a role in manufacturing, such as soldering and aligning. But an industry is not just a matter of technology; it is a human organization within which a technical process takes place, surrounded and supported by various activities of a logistic and organizational nature (Annex 9).

The products manufactured by the production centers are marketed through the sales organization. To manufacture the products, components and materials will have to be supplied by various suppliers. But such a supply, coupled with the requisite production knowledge, is not enough to maintain manufacturing activities. All the other aspects mentioned in the illustration also play an important role and, therefore, it is necessary to transfer know-how in all these areas as well. In other words, the transfer of know-how for industrial activities will always take the form of a package containing know-how covering all the aspects mentioned. Thus, there is also a need for adapted systems with respect to planning and materials management. These are of vital importance, both for regular manufacturing and for the monitoring of costs; they cover management of the flow of goods from raw materials via semi-manufactured goods to final products.

Documentation is another important element of know-how. There exists more or less detailed documentation on each product and its manufacture. In a number of cases, the documentation itself may require adaptation for use in the smaller factories overseas. Difficulties are often experienced in reading complex technical drawings (lack of training), hence perspective drawings are made available.

The quality system existing within Philips must be adapted to local standards that are sometimes different. Know-how on working with and interpreting these systems will also have to be transferred.

In addition, know-how on social, financial, economic and accounting matters will have to be transferred and its application supervised.

Apart from the various kinds of knowledge that have to be transferred, there are also different systems that can be used to achieve it. On the one hand, one can fall back on written instructions; on the other hand, direct transfer by people may have to take place. Use is made of manuals for the transfer of written know-how. These de-

scribe the assembly of products in the simplest possible way by using sketches and photographs to illustrate the process. The text itself is kept as short as possible.

The transfer of know-how by people may be of either the "fetching" or the "bringing" type. The former consists of the training of overseas staff. Such training courses, which can extend to all the areas covered by the activities, are combined where possible with practical work on a project designed for the factory from which the trainee has come.

The "bringing" type takes the form of visits by members of our staff to the various overseas factories. Here, emphasis is sometimes given to the transfer of know-how for a specific project or product. In other cases, it may be a question of transferring more general know-how in problem areas within the organization of the overseas factory, such as general engineering or materials management.

I should like to mention India as an example of the development and results of such transfers of technology and of the time such a development takes (Annex 10). Philips India was established in 1930. Since then it has grown from a small import and sales organization into a dynamic manufacturing concern making substantial exports, with 10 factories, offices and warehouses in various parts of the country.

From the beginning, Philips India has made the best use of the opportunities available to align itself to national goals and to achieve self-reliance. The company has kept itself attuned to international developments and, in the process, has emerged as a pace setter in exports. In addition, as a result of a conscious policy of integration and import substitution, Philips India was the first company to make almost every single component now being indigenously manufactured in its field.

Philips India has installed component manufacturing facilities in both the lighting and electronic areas. These facilities not only serve Philips India's own requirements, but also help meet the growing needs of industry as a whole. The company has thus been instrumental in assisting the development of the lighting and electronics industries in India.

The fully-fledged manufacture by Philips of its professional electronic equipment began with a new factory in Poona in 1960. A telecommunication factory was established

in Calcutta in 1964. These developments accelerated the pace of import substitution as well as exports.

In the more than 40 years since its foundation, the number of the company's employees has grown from 75 to more than 7,700 and its turnover has risen from Rp. 600,000 to more than Rp. 600 million. The company is also associated with more than 560 ancillary suppliers, most of whom are in the small and medium-scale sectors. These ancillary industries employ more than 24,000 people of whom more than 3,000 work exclusively on Philips offtake. The turnover of these ancillary industries amounts to more than Rp. 700 million, of which only Rp. 110 million is for supplies to Philips.

In this way the advance in technology achieved by Philips India has also benefited a great number of Philips India's suppliers, who have thus been able to add new technologies to their own manufacturing skills. The above achievements, which we believe to be impressive, have been possible only because of the fact that Philips India's industrial infrastructure is of a high quality irrespective of the items manufactured. Three of Philips India's twelve research and development laboratories are devoted primarily to helping small-scale units engaged in the manufacture of electronic equipment.

Besides the example of Philips India, I should like to mention that, within the framework of the transfer of technology, we have also had a long-term technical cooperation agreement with Bharat Electronics Ltd., Bangalore, a government-owned factory in the field of valves, transistors and magnetron tubes. In our view, this is an example of successful cooperation, both on the supplier's and recipient's side, under which, over a long period, we have made available considerable technical knowledge and manufacturing experience to the BEL factories.

Now, for my closing remarks, I should like to draw your attention to two opposing trends and interests in the field of technology transfer.

On the one hand, there are the big, fast and continuous developments in the technological field, such as integrated circuits. Vast process knowledge, sophisticated production techniques and very high investments are required for the production of integrated circuits. The speed at which technology is developing in this field may be illustrated by the fact that some 10 years ago an integrated circuit of 1 mm² comprised 6 components (3 transistors, 1 diode and 2 capacitors); it now comprises 600 components, i.e., 100 times as many.

In addition, the cost price of integrated circuits has decreased by a factor of about 10 over the last 5 years and is expected to decrease again by a factor of 10 in the next 5 years: a remarkable achievement in an age of inflation!

Therefore, only industries with extensive, mass-production facilities and up-to-date development capabilities can survive in this market.

Many more examples can be given of the evolution or revolution in the electronics industry. For instance, the development of radio valves between 1919 and 1947. Their size was reduced constantly and with the introduction of semi-conductors their application in radio and television sets and many other electronic products came to an end. Equally, the technological developments related to coils and variable capacitors have had their influence on the size and price of these products.

On the other hand, there are countries with smaller home-markets and more limited industrial opportunities. This is why Philips has established a pilot plant for adapting technology, where adaptations are made to the techniques normally used in mass production to make them more suitable for the circumstances and needs prevailing in countries with different requirements. This pilot plant works out the assembly projects in a number of developing countries, for instance in the field of radio and television production, by preparing the layout of the factory, constructing the assembly line, training the manager, staff and employees, installing the factory and making available manufacturing know-how and technical experience on a continuous basis.

Now, let me give you a short summary:

1. In my view the patent system is, and will continue to be, of importance in the more industrialized developing countries because it results in quicker publication and divulgence of inventions and technical knowledge.
2. The transfer of technology will take place, and will be implemented, independently of the existence of patent rights.
3. Transfer of know-how embraces much more than technical knowledge and I have described the develop-

ment of Philips India and the resultant wider spread of technical knowledge to ancillary industries in India.

4. Apart from actively taking part in fast and highly sophisticated technological developments, we make considerable efforts to adapt manufacturing techniques and other aspects of know-how to the needs of less industrialized developing countries.

[Annexes follow]

PATENT SYSTEM

IMPORTANCE OF THE PATENT SYSTEM IN GENERAL LIES IN

- **FASTER PUBLICATION AND DIVULGATION OF THE INVENTION AND THE TECHNICAL KNOWLEDGE INCORPORATED IN THE PATENT APPLICATION.**
- **BETTER INSIGHT INTO THE INNOVATIVE STRENGTH OF INDIVIDUALS AND COMPANIES THROUGHOUT THE WORLD.**
- **STIMULATION OF INVESTMENT IN RESEARCH ACTIVITIES.**

USE OF PATENT RIGHTS

- WE USE OUR PATENT RIGHTS IN ORDER TO ACQUIRE AND MAINTAIN OUR OWN FREEDOM OF OPERATION.

- WE ARE IN PRINCIPLE PREPARED TO LICENSE INTERESTED PARTIES UNDER OUR PATENT RIGHTS FOR A REASONABLE REMUNERATION.

APPLICATIONS FOR PATENTS FILED IN 1974 BY

	NATIONALS	FOREIGNERS	APPROXIMATE % NATIONALS OF TOTAL
ARGENTINA	1,686	3,703	31 %
BRAZIL	3,421	7,515	31 %
INDIA	1,268	2,265	36 %

SOURCE : WIPO STATISTICS 1974

APPLICATIONS FOR PATENTS FILED IN 1974 BY

	NATIONALS	FOREIGNERS	APPROXIMATE % NATIONALS OF TOTAL
BELGIUM	1,109	13,619	7.5 %
DENMARK	835	6,089	12 %
NETHERL.	2,096	14,966	12 %
FRANCE	12,706	30,927	29 %
GERMANY	30,534	33,011	48 %
JAPAN	121,509	27,810	81 %
U.K.	20,545	35,705	36 %
U.S.A.	64,093	38,445	62 %

SOURCE: WIPO STATISTICS 1974

TOTAL NUMBER OF PHILIPS PATENT RIGHTS IN

ARGENTINA

BRAZIL

INDIA

MEXICO

} 3% OF PHILIPS WORLD TOTAL

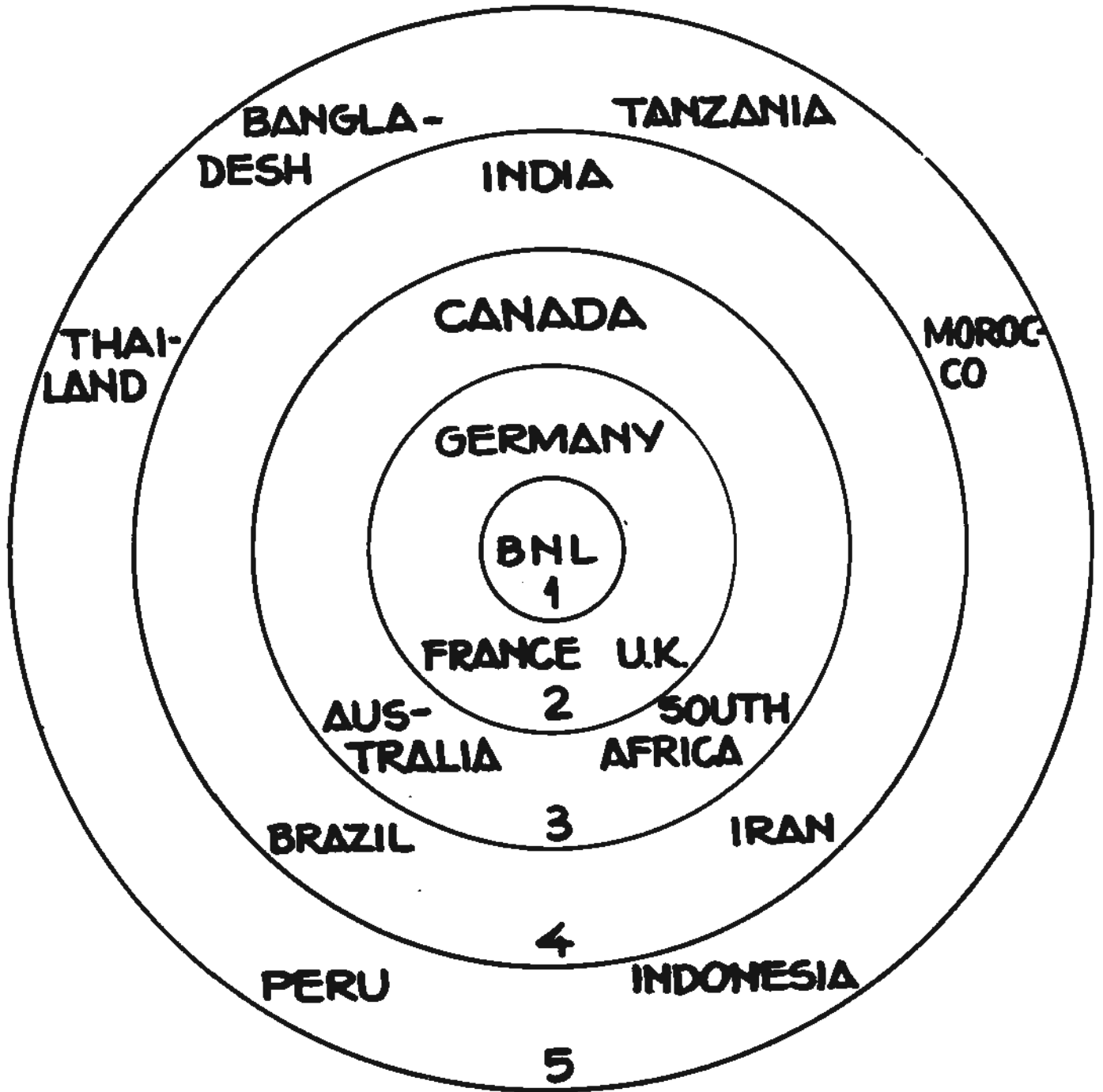
**TOTAL NUMBER OF PHILIPS PATENT RIGHTS
IN DEVELOPING COUNTRIES
1 %
OF PHILIPS WORLD TOTAL**

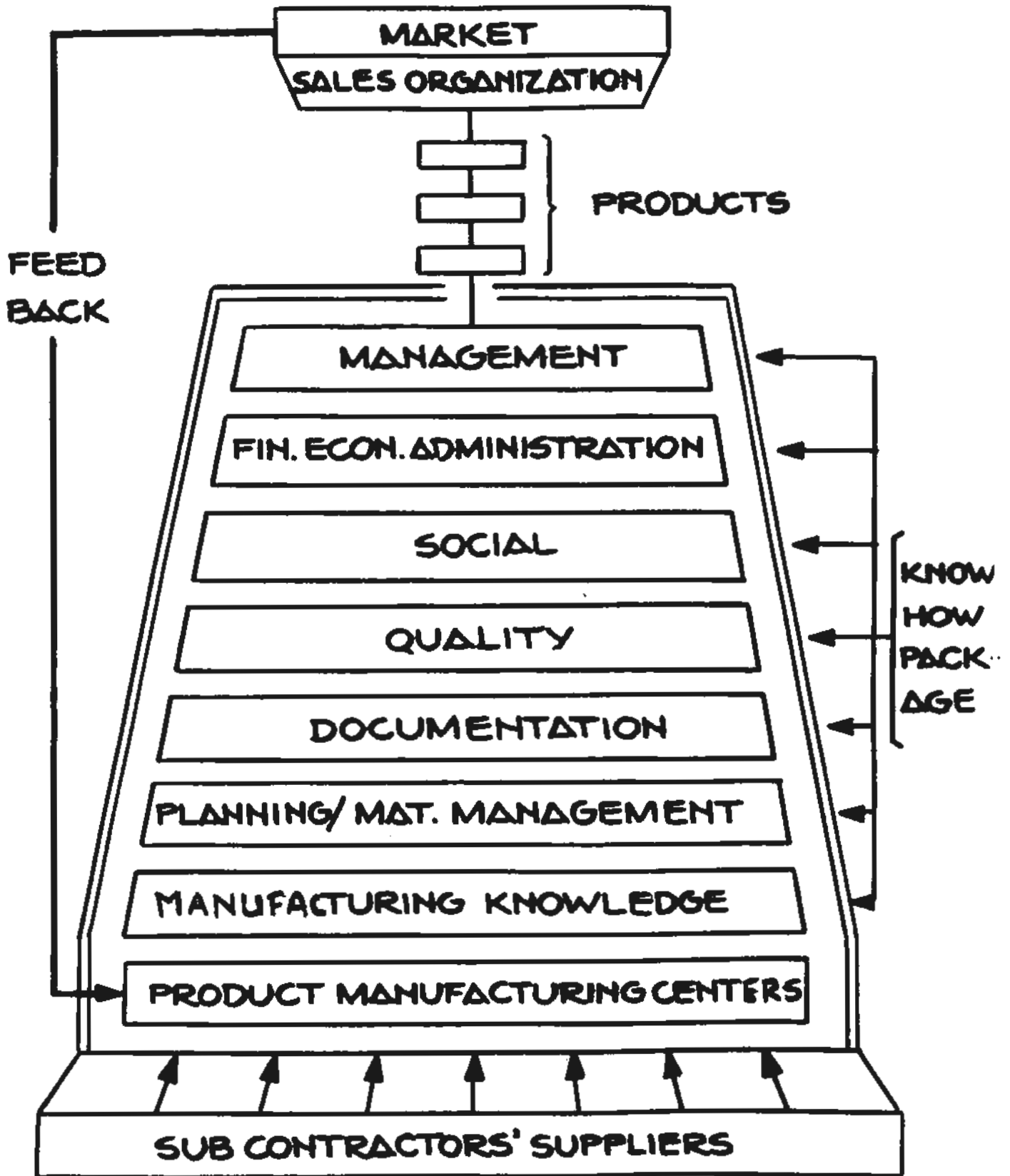
PATENT SYSTEM IN DEVELOPING COUNTRIES

- 1 THE PATENT SYSTEM IS AND WILL BE IMPORTANT IN MORE INDUSTRIALIZED DEVELOPING COUNTRIES**

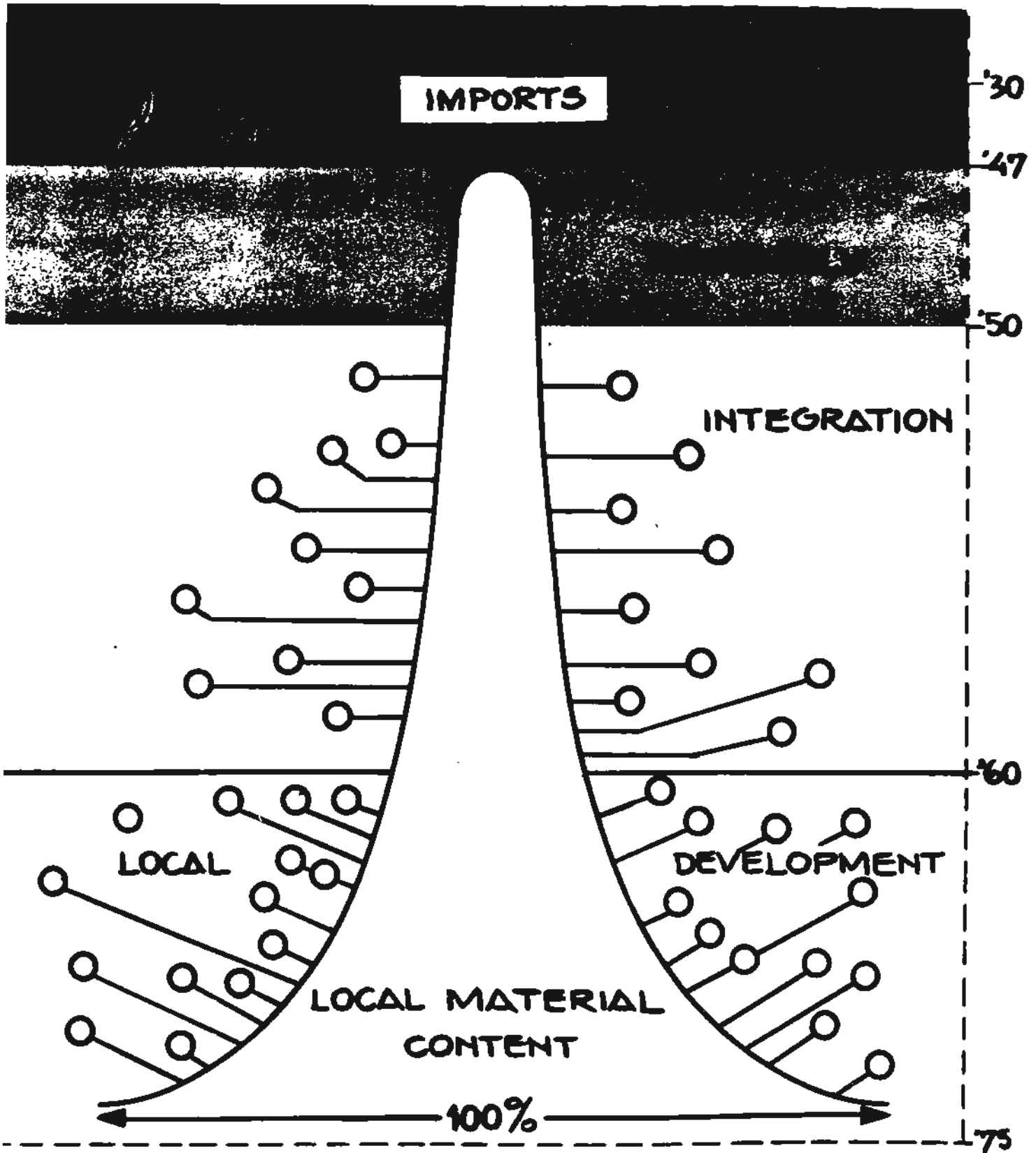
- 2 PATENT RIGHTS ARE, IN OUR VIEW, UNIMPORTANT WITH REGARD TO THE PROMOTION AND IMPLANTATION OF NEW ELECTRONIC INDUSTRIES**

- 3 TRANSFER OF TECHNOLOGY WILL TAKE PLACE AND WILL BE IMPLEMENTED INDEPENDENTLY OF THE EXISTENCE OF PATENT RIGHTS.**





INDIA



THE IMPORTANCE OF PATENTS FOR DEVELOPING COUNTRIES
WISHING TO ACQUIRE THE MOST RECENT TECHNOLOGY
AND KNOW-HOW RELATED TO PATENTS

Philippe Rouyrre

Director for Industrial Property and Industrial Agreements
Creusot-Loire
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The question has been raised whether legislation relating to patents creates, in developing countries, constraints which are more harmful than favorable to the transfer of the technology and know-how they require to achieve their industrial development as rapidly as possible.

To reply to this question, it would first of all be fitting to analyze the utility of patents and the functions they fulfill, and to examine how the transfer of technology is actually accomplished between industrialized countries and developing countries.

I. UTILITY OF THE PATENT

Existing forms of patent legislation differ but, in general, they confer temporary exclusive rights for the working of a patent on anyone who, through his work or genius, has contributed to technical progress, provided the inventor discloses his invention, through the description he gives in his patent, in such a manner that upon the expiration of the patent persons skilled in the art are capable of working it.

There is thus a counterpart between the temporary exclusive right granted by the patent and the complete disclosure of the invention to the public enabling the latter to work the invention freely when the patent is no longer in force.

II. CONSEQUENCES OF THE EXISTENCE OF PATENTS

1. Stimulation of Creativity

Research is costly, and a research program is not undertaken unless the companies involved can benefit from the temporary possibility of undisturbed utilization resulting from an exclusive right. This exclusive right is a stimulus inducing them to invest. It in fact makes it possible, firstly, to amortize the research expenditure and, secondly, to remain competitive from the technical standpoint since the progress achieved cannot be utilized immediately in this initial form by competitors.

This stimulation of creativity exists not only with respect to those who invest in research and who have found useful innovations. One might think that the success of certain research workers, and the inability of the public to use their achievements because of the patent, would discourage the public. But, in fact, this is not the case because the exclusive rights conferred by patents induce those who do not possess them to find competing processes not involving the existing patents and leading to the same or even better results. It may thus be said that the patent stimulates invention in successive stages.

2. Stimulation of Industrial Progress

In general, countries in which companies carry out research benefit from the resulting economic progress. The standard of living there is improved and trade is enhanced, particularly towards export markets.

It is pointless to dwell here upon the examples which might be given of highly industrialized countries with a high level of creativity and capable of placing sophisticated products on the international market at competitive prices.

3. Development of Information

The patent is a document which fully describes an invention and, in this regard, it constitutes an extremely valuable element of information. It is in fact the medium for the dissemination of the most recent technology since, in general, patent applications must be filed before any disclosure or utilization, and because they relate to the latest inventions. In addition, the inventions of greatest interest are filed

not only in the country of origin but in several other countries as well and, consequently, in different languages. This allows easier understanding of technical information by the different companies in the countries involved and, in particular, in developing countries.

Patent specifications also make it possible to determine the general state of development of the technology concerned and give the names of the companies which study and possess these technologies.

Hence, patents yield information which is of a twofold nature: purely technical information and commercial information. Thanks to the names of the applicant companies, it is possible to know to whom one has to apply to obtain the transfer of knowledge.

4. Stimulation of Technical Transfers

The patent stimulates the transfer of technology in several ways:

- It gives such transfer a known legal framework that is used very frequently and contains legal clauses which, through frequent discussion, have become relatively well known.
- It gives a precise definition of the context of the transferred technology and ensures that this technology is the best and the most improved since foreign patent applications are the result of a choice made from among the national patents possessed by a company, because companies do not commit themselves to patent expenditure for inventions which are of limited scope or which have already been filed by competing companies.
- It protects the licensee. This protection, which was in fact in the hands of the patentee, is acquired by the licensee, who is then protected in the working of the patent, particularly against imports. The function of the patent, which was to provide protection and, in particular, protection of investments made by companies, then becomes an economic function protecting licensees against the incursion of competing products from foreign countries. With this protection, the licensee can set up a national industry and allow his country to pursue industrial development which, in time, will lead to the export of manufactured products and the inflow of currency.

- It protects investments in the countries to which technology is transferred, irrespective of whether these investments are made only by local industries or by foreign industries creating companies with the use of local labor, or by both.

III. DURATION OF PATENTS

The duration of the protection afforded by patents is not the same in all countries. In spite of these differences, the patent grant periods are relatively long.

This is a favorable factor in transfers of technology because it encourages the continuity of transfers for a given technology. The patent constitutes a convenient medium for this continuity of transfer over a sufficiently long period.

Licensees are thus assured of knowing the technology in all its aspects and this is particularly important in the case of complex technology.

In addition, licensees have sufficient time to assimilate the technology and not only get into the habit of receiving the improvements developed by the licensors but also learn from the licensors the methods they use to achieve the improvements and to remain technically competitive.

The result is that, upon the expiration of the license contract, the licensee will not only have completely assimilated the technology and become familiar with the improvements, but will also have learned how to handle and improve the knowledge received himself.

An agreement to transfer technology creates a competitor for the person making the transfer. This is a disadvantage for the person transmitting the technology, and the recipient does not benefit fully from the advantage unless he has become proficient in handling the technology, that is to say, when, thanks to the patent and to its duration, he has worked sufficiently long with the original patent.

IV. TECHNICAL AGREEMENTS AND LICENSE GRANTS

License grants constitute a particular kind of technical agreement, of which they form part.

The purposes of such agreements are to ensure the working, or the joint working by two or more partners, the creation or the development of a technology or a group of technologies belonging either to one of the parties or to several of them. These purposes are very wide-ranging and their definition shows that many types of agreements may be entered into.

A general analysis will be given below of the practical situations encountered in relations between companies from industrialized countries and companies from developing countries.

V. REASONS LEADING A COMPANY IN ONE COUNTRY TO TRANSFER TECHNOLOGY TO A COMPANY IN ANOTHER COUNTRY

The first concern of a company which manufactures products is to develop its sales as much as possible. In this regard, transfers of technology would appear to be contrary to the essential interests of manufacturers. As indicated earlier, the granting of a license creates, in time, and sometimes immediately, a competitor for the grantor. It would thus appear to induce him not to grant a license but to work the patent himself. In order for him to transfer his knowledge, there must be a significant motivation. Whatever the recommendations that may be made from a humanitarian viewpoint, companies which have expended considerable efforts and large sums of money to develop certain products will not agree to transfer the knowledge they have acquired unless they find an advantage and unless the recipient countries do not create intolerable constraints with regard to the remuneration of the transferred technology.

However, there are cases in which sales in certain countries are either not possible or only partially possible.

For example, remoteness may be such that the cost of transportation favors countries near the purchasing countries and works against the competitiveness of products coming from very distant countries. Moreover, it will not be easy for a given company to consider satisfying the needs of the world market. Its size constitutes a limit which it cannot exceed without becoming involved in unreasonable investments. It is thus necessary for it to find a relay, which, quite naturally, will be equivalent companies in the purchasing countries.

Finally, and this enumeration is not exhaustive, the purchasing countries may not have sufficient currency to make

purchases of the products they require but, on the other hand, they can afford the purchase of a technology in the form of a lump sum or a royalty.

The foregoing constitute motivations for the transfer of technology which offset the drawbacks pointed out with regard to the creation of competitors.

VI. CHOICE OF PARTNERS FOR TECHNICAL AGREEMENTS

Throughout the world there are always companies in some countries which seek to set up or develop a national industry and companies in other countries which possess valid technology and are looking for partners.

The first problem encountered by these companies is that of establishing contact. For some, what is important is to find the right technology and, for others, the right partner.

In this endeavor to establish relations, patents can take on considerable importance and this is where their informative function comes into play. They describe the most recent technologies in several languages, specifying the names of the companies which possess them. For companies seeking to acquire a new technology or to improve those they possess, it is possible, thanks to patents, to identify the companies in different countries to which they can apply.

Conversely, companies possessing technologies and looking for partners to work them can, by investigating the latter's patents, identify the industries which are already working in their own technical field and which may be seeking aid.

The information thus works in both directions: for the companies of purchasing countries and for those of selling countries.

Other sources of information can of course be used. Certain companies in fact are known throughout the world as specialists in certain areas and it is not necessary to consult patents to find out about them. Patents, however, remain valid as elements of information because they often make it possible to find out whether the knowledge which may be acquired is utilizable considering available labor, existing equipment, and the industrial capacity of future licensees.

Finally, there is another means of finding partners. In general, major world investment projects--for example, in developing countries--are known through companies having good export possibilities. Those companies may require the help of local industry or of the industry of a neighboring country, as well as the cooperation of manpower located in or near the countries of utilization.

VII. THE PARTICULAR CASE OF A FRENCH COMPANY

The case considered is that of one of the largest French corporations having activities in two different areas: heavy mechanical equipment and special metallurgy.

This company carries on extensive export activities and is oriented, particularly in the field of heavy equipment, toward various world projects in this area.

As regards heavy mechanical equipment, the patents it files characterize a certain number of product lines and, in this respect, it is approached by companies of foreign countries desiring to create a local industry or to develop the industry they possess. Often, the patents are accompanied by know-how which, when it is transferred, allows the licensee companies very quickly to gain a foothold in the market, and to avoid loss of time and manufacturing defects. In fact, in the field of heavy mechanical equipment, errors can have catastrophic consequences in view of the value of the manufactured elements. Certain mechanical components involve the use of costly metals and many manufacturing hours. A small error can lead to the replacement of a very costly component and even to the shutdown of an installation for an extended period. Moreover, certain elements of the know-how are absolutely necessary for obtaining required performance levels from installations, even if the various elements of the equipment are properly designed.

As regards metallurgy, product patents very often go hand in hand with process patents; for example, in the production of certain steels and certain very special alloys. The know-how is also essential and plays a significant role in the quality of the products obtained.

VIII. HOW NEGOTIATIONS ARE CONDUCTED

What follows falls within the context of the above-mentioned company.

It is extremely rare that negotiations are concerned with the granting of a license or the transfer of knowledge concentrated in a single patent. In the field of heavy mechanical equipment, as well as in metallurgy, transfers concern complete technologies permitting the setting-up of difficult or complex installations or the manufacture of certain ranges of metallurgical products.

It is always necessary to establish at least a first contact between partners, to analyze the respective situations and enable the partners to get to know each other.

The future licensee must know with whom he is dealing and the extent of the installations of his future licensor. It is desirable for him to visit these installations and to ascertain for himself that the products he wishes to manufacture or sell are indeed produced with satisfactory quality. He must be able to learn what his future licensor can transfer to him.

The future licensor must know whether his future licensee is capable of using the knowledge he will be transmitting, what personnel he has at his disposal, and his ability to assimilate the technology. What are his production facilities? If these are inadequate, can he finance investments or can he obtain a loan for such financing?

If the products are complex and require design studies for adaptation to particular cases, does the future licensee have sufficient design-office capability and trained personnel?

Finally, from the commercial standpoint, is the future licensee able to obtain orders and increase the number of customers?

It is rare that a single contact will be sufficient, and several meetings are sometimes required in both of the partners' countries to work out the details indispensable for concluding an agreement.

Other contacts will also be necessary for defining the guidelines for the contemplated agreement. The patents must be identified: they will make it possible to determine the protection to be transferred to the licensee and the country in which it will be applied.

Finally, the draft agreement will be drawn up to grant the license, transfer the know-how, provide technical assistance and, in particular, the training of the licensee's personnel. In certain cases, the agreement may be accompanied by a supply contract allowing the licensee to begin his commercial prospecting very rapidly without waiting to be in a position to manufacture all the equipment for which the license is granted or the know-how transferred.

In this field, the general rule should be that the licensor should have an incentive to grant his license and, consequently, should find an interest in it. As for the licensee, he should be able to draw profit from it, as well as the possibility of development within his national framework. The agreements must consequently be equitably balanced, with each party drawing his own particular benefit.

Patents also show their usefulness here through their protective function, this protection ensuring the licensee of the exclusive right he requires for his undisturbed commercial development and for assisting him in the business dealings he will have with his future customers.

No one can require a company possessing technology to disclose it to another. Patents facilitate the transfer of know-how by virtue of the protection they afford to the patentee; this protection is then transmitted to the licensee within the framework of a contract in which the interests of both parties are suitably protected on the basis of a mutual agreement.

In closing, let me cite the example of Japan, where industry found itself, after the Second World War, in a position which there is no need to recall here. Japanese industry deliberately committed itself to a policy of license acquisition backed by a system of patents with prior examination, and the results of this policy are now well known: Japan has become one of the world's leading industrial powers.

IX. CONCLUSIONS

There are essentially two conclusions.

The first is that an effective patent system offers several types of advantages in the field of the transfer of technology, from the standpoint of the protection given to the licensee's business and investments, the information provided, and the help in preparing technical agreements.

The second is that patent systems must be maintained in developing countries even if they have to be adapted to their needs. This is a problem which has given rise to discussions elsewhere and will not be dealt with here. In this regard, it should nevertheless be mentioned that the PCT provides an attractive solution to one of the concerns of developing countries, that is to say, the examination of patent validity. However, this too is a problem which is not within the scope of the present lecture.

EFFECT OF PATENTS ON
TRANSFER OF TECHNOLOGY AND FOREIGN INVESTMENT
IN PAKISTAN

M.O. Bhatti

Controller of Patents and Designs
Pakistan

When Pakistan gained independence from foreign domination in 1947, the stamp of the colonial policies of its erstwhile rulers was clearly visible on its economy. The area had been set apart for agricultural production to suit the scheme of imperial trade. The setting up of large-scale industries was discouraged. Local crafts were not in a position to compete with the goods manufactured in the large plants of the mother country. Cottage industries gradually shrank, yielding ground to even larger imports. The economy of the country had thus become purely agricultural by the time of its independence. For example, large-scale industries contributed only 1.5% to its Gross Domestic Product in 1947.

The import of manufactured goods was a drain on the country's scarce and valuable foreign exchange. Production of these goods within the country was clearly necessary.

The country therefore embarked upon the plan to industrialize in the shortest possible time. The establishment of industries was encouraged. Ample facilities for loans in local as well as in foreign currency were provided and licences were liberally issued for the importation of capital goods. Import of consumer goods competitive with the goods produced within the country was restrained. These efforts proved a blessing. The factories came to be equipped with the latest machinery. Unfettered by obsolescent equipment, the new industries were favoured by the same circumstances which helped Western Germany to outdistance the United Kingdom in industrial activity. The pattern of relative development was more or less repeated in the subcontinent.

Despite the advantage of copious resources, a broader industrial base and a larger market, production in India did not expand quite as fast as in Pakistan. The index of industrial production in Pakistan increased to 196 as compared with 150 in India in the period from 1963 to 1973. In absolute terms, too, Pakistan did just as well. The contribution of industry to the Gross Domestic Product increased from 5.8% in the year 1949-50 to 11.7% in the year 1966-67. Despite the dynamic growth in the agricultural sector, its contribution to the Gross Domestic Product decreased from 60% to 45.7% during the same period, underlining the still more dynamic role played by industry in generating the national wealth.

The relative importance of its industry within the global framework is also significant. It accounted for 0.3% of the world industrial production in 1974 as compared with India's 0.9%.

The above facts indicate the importance of the role played by the qualitative transfer of technology in transforming the agricultural economy into a semi-industrial one in a comparatively short period. But for the depredations of three wars on the country's economy in its 29 years of existence, the impact of this transfer would have been significantly greater.

As a person who has been associated with the patent system for about 27 years, I am naturally interested in knowing the contribution of patents to the process of industrialization of the country. Local patents do not amount to much. Only 5% of the patents granted in Pakistan are of local origin. This is understandable.

The field of commonplace inventions has more or less been exhausted. Empirical inventions resulting from developments in contemporary technology are too easily pre-empted by countries pursuing advanced research. The use of sophisticated equipment does not necessarily imply competence to produce the equipment also. The capital goods industry must be sufficiently mature to produce advanced equipment and to undertake the necessary research. No wonder few inventions originate in developing countries. The standard of these inventions is generally low. The contribution of indigenous patents to local technology is therefore not likely to be substantial. The exploitation of foreign inventions, too, is not generally practicable per se in countries at a lower level of development in relation to others. It is therefore doubtful whether patents granted in a developing country essentially further the

cause of technology to a significant degree until the local technology becomes mature enough in its own right to be in a position to translate the patents into finished technology. The difference in levels of development which would still exist should not be insurmountable. It is mere conjecture to predict the time when Pakistan will be in a position to profit significantly from patents in sophisticated fields, but it is already capable of translating most of the less sophisticated inventions into finished technology, and the gap is being narrowed with time. Secretary-General U Thant's report on patents estimated that developing countries lagged behind developed countries by 15 years in technology. This estimate appears to be optimistic. But whatever the figure for the gap may be, the fact remains that it would have been reduced by this time but for the three wars inflicted upon Pakistan in the 29 years of its short existence.

The logical course open to a country in the initial stage of its development is to effect direct transfer of finished technology. This course was also adopted by Pakistan. Equipment and technical know-how were imported on a large scale and on a party-to-party basis. Foreign collaboration was enlisted in the establishment of industries and foreign investors established subsidiaries in many cases. The results achieved were dramatic. A large number of industries were established, as may be seen in the Appendix.* Perusal of this Appendix shows that foreign investment has been particularly active in fields like pharmaceuticals, chemical fertilizers, natural gas, etc. Foreign collaboration in other fields has also been substantial. The country has not only achieved self-sufficiency in many fields, but has also achieved export capability in some areas. The textile industry alone employed over 200,000 workers.

It has not been possible to determine in exact terms the direct contribution of patents or the role played by them in the industrialization of the country. It is certain, however, that patented technology did play a very important part, particularly in the field of pharmaceuticals. Information on royalty payments for patents is submerged in the broader category of technical fees. In 1973-74, 7 million Rupees were paid by Pakistan. The contribution of local patents cannot be ascertained for various reasons.

The Patent Office's lack of statutory power to collect information about the working of patents in Pakistan is one of these reasons. Keeness to achieve industrial development and economic self-sufficiency as quickly as possible may also have contributed to this lack of information, because, for rapid industrialization, the purchase and import

* The Appendix to this lecture appears at the end of the text.

of complete plants was considered expedient. The question of patents was not generally raised in such transactions. Foreign manufacturers, however, included patent royalties and fees for technical know-how and collaboration in their package deal. Pakistani industrialists paid no heed to the fact whether or not the patents involved in such industries had been actually taken out or were in force in Pakistan. Local industrialists did not object to these payments, not only because of ignorance of the legal position on the subject, but also because the return on the capital was so quick and ample in view of the generous facilities given to them by the Government, in the form of loans both in local currency and foreign exchange, tax holidays and tariff barriers against the import of goods, that they did not consider the payment of these fees a matter for concern. The private sector neglected some fields of industry, however, either because the size of the projects was forbidding or because the industry did not promise quick returns. The public sector therefore stepped in to remove the effects of lack of interest on the part of private industrialists.

An Industrial Development Corporation was established and assigned the task of setting up industries for the manufacture of paper, sugar, dyes, chemicals, cement, fertilizer, dry docks and marine engines. The Corporation made use of some patents granted in Pakistan. But again information on this subject is not complete. However, stray information about the royalties paid to foreigners for the exploitation of patents obtained by them in Pakistan is given by way of an indication that even local patents were used. For example, the Pakistan Industrial Development Corporation paid the following amounts for the following manufactures:

			Rs.
Dyes & Chemicals	...	...	288,000
Dry Docks	...	...	68,412
Marine Diesel Engines	...	...	30,708
Sugar Machinery	...	...	42,791

From the above it would appear that patents granted in Pakistan were not inactive after all, even in the initial stage of the country's development. Of course, the contribution was not large, but then not much was expected. There is a disturbing trend, however: the quantum of their contribution, instead of increasing, appears to be waning. One reason might be the fact that foreigners are now more interested than ever in obtaining protection for their inventions only in fields which offer immediate scope. This state of affairs is reflected in the growing lack of

interest on the part of foreign applicants in taking out patents in the country. The number of patent applications filed by foreign applicants decreased from 1,450 in 1966 to 490 in 1976. A number of factors can be surmised to account for this fall.

It appears that the ability to exploit inventions has not matched the expectations of prospective foreign applicants. The equipment and products manufactured in foreign countries for export to Pakistan are generally covered by patents in countries capable of manufacturing them. The erroneous notion entertained by prospective applicants as to the inability of local industry to exploit these inventions predisposes them to dispense with the necessity of protection for their inventions in Pakistan. Since foreign manufacturers include patent royalty payment in the cost of equipment exported to Pakistan, the motive for taking out patents for the purpose of receiving royalty payments in Pakistan is further weakened. The worldwide recession might be the cause of the drop in filings, particularly in countries considered to be of marginal importance. Pakistan accounts for only 0.3% of world industrial production, and therefore the prospects of exploiting an invention might seem far-fetched to foreign industrialists.

But the most nagging reason, which might well be true, is the presumption that the patents are filed in developing countries without real justification, through error of judgment or sheer habit. Considering that a very large number of inventions are intended to be patented in many countries, a small percentage of these inventions finds its way to the patent offices of developing countries, to produce respectable figures in the case of those countries. For example, a favourable decision in respect of 1% of 50,000 international applications would swell filings in Pakistan by 500 applications, that is, more than the total actually filed in Pakistan.

Since marginal decisions are apt to be sensitive to extraneous influences, filings do not constitute an indication of the facts predicated by these figures. In 1965 Pakistan acquitted itself well in the war against India, and filings increased dramatically to 1,400 applications. Immediately after the disastrous war of 1971, their number plummeted from 1,000 to 450 and has been hovering around the 500 figure since then, despite the fact that the industrial potential of present-day Pakistan is probably greater than that of Pakistan and Bangladesh combined in 1965.

The moral of the above analysis is that the patent system in its present form does not suit the requirements of developing countries. The assumptions considered basic to the patent system are not relevant to developing countries still living in the early industrial age, yet wide open to the influence of the advanced technologies applied in post-industrial societies. The functions of the patent system need to be redefined in terms of the requirements of developing countries, by emphasizing its role as an instrument for the transfer of technology.

Some of the efforts in this direction will have to be provided by the developing countries themselves. The patent offices of these countries will have to be equipped with adequate means for disseminating information on patented technology among industrialists. But in some areas the problem has to be tackled at an international level, and WIPO can play a very useful role in this respect.

[Appendix follows]

APPENDIX

<u>Industry</u>		<u>Foreign Investment</u> (in millions of Rupees)	<u>Total Investment</u>	<u>% of Foreign Investment</u>
Chemical Fertilizer	(2)	510,800	746,900	60%
Insecticides, Pesticides	(1)	1,980	2,480	80%
Pharmaceuticals	(28)	167,433	280,411	59%
Glass Ampoules, Vials	(1)	6,110	10,873	56%
Vegetable Ghee & Soap	(1)	21,000	37,100	56%
Storage of Edible Oils	(1)	642	1,148	56%
Cocacola Concentrates	(1)	700	700	100%
Sui Gas Distribution	(1)	408,120	755,390	54%
Oil Refineries	(2)	94,000	121,000	77%
Lubricating Oils	(2)	22,000	48,000	46%
Liquid Petroleum Gas	(1)	2,446	3,000	80%
Industrial Gases & Welding Electrodes	(1)	10,100	16,700	60%
Steel & Brass Screws	(1)	3,180	5,300	60%
Lifts	(1)	218	1,363	16%
Sugar	(1)	5,500	26,434	28%
Asbestos Cement Sheets & Pipes	(1)	8,000	20,120	40%
Soda Ash	(1)	83,000	107,800	77%
Ultramarine Blue	(1)	1,471	2,750	53%
Writing Ink		22	350	6%
Paper & Paper Board Packages	(1)	44,120	92,420	47%
Hessian Sacking	(1)	5,000	13,300	37%
Security Paper	(1)	2,500	30,920	
Card Clothing	(2)	3,463	8,383	41%
Two & Three-Wheel Automotive Vehicles	(1)	250	625	40%
Car & Truck Tyres	(1)	7,600	18,030	42%
Agricultural Tractors		10,000	30,000	33%
Paints, Synthetic Resins	(3)	7,448	14,074	50% approx.
Agricultural Equipment	(1)	544	2,000	20% approx.
Storage Batteries	(2)	5,264	6,805	60%
Safety Matches	(1)	6,930	8,800	78%

<u>Industry</u>		<u>Foreign Investment</u> (in millions of Rupees)	<u>Total Investment</u>	<u>% of Foreign Investment</u>
Chemical Auxiliaries	(1)	2,163	7,431	29%
Maize, Starch, Glucose, Dextrose		10,800	26,300	41%
Guar Gum	(3)	5,700	9,500	60%
Essential Oils	(1)	1,885	3,425	55%
Centrifugal Pumps	(1)	4,560	6,000	76%
Electric Motors, Transformers, Generators, Switchgear	(3)	22,120	33,386	66%
Circuit Breakers	(1)	10,800	12,900	83%
Poultry Farming	(3)	1,406	4,780	29%
Computer Cards		494	494	100%
Polishes (Shoes & Metal)	(1)	856	1,712	50%
Footwear (Leather & Rubber)	(1)	16,500	16,500	100%
Cotton Textile	(1)	1,070	26,686	4%
Gramophone Records	(1)	848	1,414	60%
Cigarettes	(6)	89,099	148,227	60%
Electric Wires & Cables	(1)	9,260	16,500	60% approx.
Sewing Machines	(1)	10,390	14,140	73%
Radio, Television, Lamps & Tubes	(1)	11,285	21,541	over 50%
Silicon Transistors, Carbon Resistors	(1)	2,990	7,410	40%
Sewing & Embroidery Threads	(1)	2,358	3,918	60%
Brassieres	(1)	2,586	4,442	over 55%
Hotels & Restaurants	(5)	86,067	149,739	58%
Tea Packing	(3)	27,710	56,799	48%
Drums & Metal Containers		3,534	28,807	12%

TRANSFER OF TECHNOLOGY IN
RELATION TO PATENTS IN INDONESIA

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I. INTRODUCTION

1. Those who have the opportunity to study business operations in the developing countries are aware of striking similarities in technology transfer situations. The social, political, and economic influences which one finds in one developing country are also manifest in another. All of these countries, although separated by ethnological borders, have many common problems.

2. This being the case, certain specific features can nevertheless still be observed. Specific features can be distinguished as evidence of a historical past and of the social and cultural habits and behavior inherited by the people. In this context, Indonesia is not an exception.

3. Therefore the only purpose of this paper is to provide this February gathering with some insight into technology transfer situations which can be recognized as being a specific feature for Indonesia. As such, it cannot claim to give an elaborate and exhaustive picture.

II. SELECTION OF TECHNOLOGY

4. In order to facilitate the selection of the foreign technology which is most appropriate for transfer, adaptation and assimilation into Indonesia's economy, the appropriate governmental authorities undertake the following activities:

- (a) identification of Indonesia's industrial development needs, in order of priority;
- (b) identification of the national technology available to fulfill those needs, and of the gaps in that available national technology;
- (c) identification of the foreign technology available to fill those gaps;
- (d) identification of the national manpower and material resources available for utilization in conjunction with the required foreign technology;
- (e) comparative evaluation of the available foreign technology's appropriateness for transfer, adaptation and assimilation into Indonesia's economy, particularly with reference to the technology's capacity for utilizing available national resources;
- (f) such other activities as the Ministry of Industry, in consultation with the appropriate governmental authorities, considers most effective for the accomplishment of optimum foreign technology selection.

5. This selection is designed to help shift the initiative in the technology transfer process from foreign technology suppliers to the Indonesian Government and national technology recipients.

6. The principal selection involved to date in Indonesian technology transfer transactions has been the foreign technology suppliers' selection of Indonesia as a country in which to invest, followed by their selection of Indonesian enterprises with which to deal as licensees. No significant selection of appropriate foreign technology or technology suppliers has, as a general rule, been undertaken by the Indonesian Government, or by Indonesian firms.

7. Nationals have most often been the passive, not the active, parties in technology transfer contacts; they have concentrated their efforts on making the best of transaction negotiations initiated by foreign suppliers who have come to them. Moreover, in the absence of accurate current data on alternative foreign technology sources, the consequence of such a passive role can be the receipt of inappropriate, obsolete or unnecessarily costly technology.

8. The selection proposed above would move from this status quo to a new situation in which the Ministry of Industry, in consultation with the relevant governmental agencies, makes its own assessment of foreign technology demand and supply without waiting for technology suppliers to initiate contacts. At least five basic steps, as mentioned above, would be involved in the proposed selection process.

9. It should be noted that the selection process outlined here has numerous practical applications. Most important among these applications is the process's capacity to support and be fully integrated with the program of transactions. Three facets of that interaction are highlighted below:

ensuring the compatibility of transactions with the interests of national economic development, especially in terms of non-duplication of technology already available within Indonesia;

ensuring technology supplier's maximum utilization of available national manpower and material resources;

utilizing technology transfer data gathered from foreign and international sources for the purposes of monitoring transaction performance and identifying the most appropriate available foreign technology.

10. From December 13 to 18, 1976, a Scientific Conference on Patents and Trademarks was held in Jakarta. In one of the discussion papers, presented by Prof. Dr. Ir. Iskandar Alisyahbana on "Some Major Issues Concerning the Transfer, Adaptation and Technological Promotion Process," an evaluation of the assessment of technology was made as follows:

- (1) Definition of the problems or projects to be analyzed.
- (2) Identification of alternatives of existing and potential technology.

- (3) Identification of economic, sociological, political and cultural consequences of each alternative.
- (4) Qualitative and quantitative evaluation of those consequences.
- (5) Identification of the institutions responsible for decision making.
- (6) Identification of several alternatives to decisions made by those institutions.
- (7) Identification of the groups/parties that are or might be involved.
- (8) Identification of means of attaining the aim.
- (9) Identification of the influences upon competition and cooperation between nations.
- (10) Identification of the social changes (aim orientation) that could influence the original technology.
- (11) Conclusion and recommendation.

11. Perhaps most important, an efficient continuous selection program could be the establishment of an overall national technology transfer policy geared to national development needs.

III. THE PATENT SYSTEM AND ITS ROLE IN TECHNOLOGY TRANSFER

12. Indonesia has no Patent Law as yet, but the Government did prepare a draft Law on Patents a long time ago. This draft Law is not yet a final one, and consultations are still taking place on changes, adaptations to our national development needs, and integration into our legal system. While waiting for the Law on Patents to be promulgated, every inventor can temporarily file an application relating to his invention on the basis of Announcement No. J.S.5/41/4 of the Minister of Justice, dated August 20, 1953.

13. Let us now consider the draft from the viewpoint of the technology transfer system. A preamble to a law in Indonesia can serve as a preliminary statement of legislative purpose. The preamble presents an invaluable opportunity to establish

the lawmaker's policy priorities. Placing emphasis on private property interests in the preamble is inconsistent with what ought to be the principal function of patent legislation in a developing country, namely, to contribute to the country's economic development by promoting and controlling the transfer of foreign technology.

14. It is true, of course, that patents can also be granted in developing countries for domestic inventions, although, statistically, as we have learned from our reading, domestic inventions account for only a small fraction of the total number of patents granted in developing countries (see UNCTAD Paper TD/BAC.11/19 of April 23, 1974, entitled "The Role of the Patent System in the Transfer of Technology to Developing Countries," where it is stated that, according to the world distribution of the 3.5 million patents granted, 200,000 patents or approximately 6% are in developing countries, while the population of the developing countries is 80% of the world population. Of those 200,000 patents, 90% to 95% are not worked in the developing countries).

15. But even with regard to local inventors, the Patent Law's central objective must be to protect the public interest by granting monopoly protection which is only of secondary importance to that of the State. In fact, the latter protection is extended only in consideration of the disclosure of the inventions.

16. Patent protection is only a means to an end, and that end, namely, the public interest in acquiring technology, is what ought to receive priority attention in the Preamble to the Patent Law. So we could consider that a Patent Law is required to enhance national industrial and technological capabilities by promoting and controlling the transfer of foreign technology and by stimulating domestic inventiveness and innovation.

Obligations of the Patent Holder

17. An excellent source to consult at the outset of a review of the question of patent owners' statutory obligations is the UNCTAD "Promotion" paper, in paragraphs 71 to 88. That analysis proposes that patent obligations be conceptualized as falling into three categories:

"positive" obligations to do certain things;

"negative" obligations to refrain from doing certain other things;

"informational" obligations to report to the Government on patent-related activities.

18. Conceptualization seems to be extremely helpful: it forces us to think of patent obligations in far broader terms than simply the context of working patented inventions; moreover, it invites us to structure those obligations in a form compatible with a possible future expansion of the list of patent obligations once the Government learns from experience what standard and scope of performance may reasonably be demanded of patent owners' licensees.

19. The reference to licensees is included in the previous sentence because licensees, both compulsory and contractual, ought, under the Patent Law, to be held to the same obligations with regard to their enterprises as are patent owners with regard to the entire field of patent exploitation.

The Patent Owner's Positive Obligations

20. (1) The registered owner of a patent shall, in consideration of his receipt of the exclusive rights granted to him, be obliged:

- (a) to work the patented invention in Indonesia on an uninterrupted basis for the duration of the patent, and
- (b) to conduct such other activities as are prescribed by Rule, including, for example, the facilitating of domestic innovation, research and development, in the interests of strengthening Indonesia's technological capabilities.

(2) For the purposes of paragraph (1) above, the working of a patented invention shall mean the manufacturing of a patented product, or the using of a patented process, in an effective and serious way in an enterprise existing in Indonesia, and on a scale which is adequate and reasonable under the circumstances. The scale of working shall not be deemed adequate and reasonable if, inter alia:

- (a) the working of the invention in Indonesia does not meet the demand for the patented article on reasonable terms;

- (b) the working of the invention in Indonesia is prevented or hindered by the importation of the patented article by the registered owner of the patent, or
- (c) by reason of the refusal of the registered owner of the patent to grant licenses on reasonable terms, the demand for the patented article is not being met on reasonable terms, or the establishment or development of industrial or commercial activities in Indonesia is unfairly and substantially prejudiced.

The Patent Owner's Negative Obligations

21. The registered patent owner shall, in consideration of his receipt of the exclusive rights granted to him, be obliged to refrain from conducting any activities with respect to his patent, including restrictive business practices, that the Government, by Rule, may prohibit as being detrimental to the strengthening of Indonesia's technological capabilities.

The Patent Owner's Informational Obligations

22. (1) The registered patent owner shall, in consideration of his receipt of the exclusive rights granted to him, be obliged to submit to the Government the following information, in the Indonesian language:

- (a) annual reports, commencing one year after the grant of the patent, indicating fully the extent of his fulfillment of the obligations mentioned above;
- (b) prompt reports on improvements or innovations in the patented invention made by the owner or his licensees; and
- (c) periodical reports providing such additional information relating to the patented invention and patent-related activities as the Government may from time to time prescribe by Rule.

(2) The Government shall promulgate Rules regarding the form, timing and detailed contents of the reports to be submitted by the registered patent owner.

Compulsory Licenses and Contractual Licenses

23. It is essential, in order to keep the issue of compulsory licenses in the proper perspective, to recognize that compulsory licenses have not proved an effective device in developing countries for curbing foreign patent owners' patent abuses. What is more important, compulsory licenses are not likely to prove effective for this purpose in the future, regardless of how compulsory license provisions are drafted in a patent law in an effort to correct past defects. The key weaknesses involved are interrelated: the prolonged delays in compulsory license implementation, which are themselves attributable to tedious judicial proceedings and to the Paris Convention grace period requirements; and the patent owners' defense of "legitimate reasons" for non-working, which is authorized by the same provision of the Paris Convention, as a bar to the granting of compulsory licenses. Nevertheless, two chronic flaws are inherent in the compulsory license mechanism which cannot readily be corrected: the compulsory license scheme rests on the assumption that a local third-party enterprise stands ready with adequate skills and financial resources to take over exploitation of the patented invention from the patent owner, in other words, is ready to function as a compulsory licensee; and a further assumption is that the local enterprise is going to be able to make a success of its compulsory license operation without the benefit of access to the patent owner's cooperation or know-how. We believe that, in the vast majority of developing countries, those assumptions will prove unrealistic. Notwithstanding this, we believe that it is worth providing for compulsory licenses in our Indonesian Patent Law. In the case of contractual licenses, the patent owner is still to be held fully accountable. He should, however, be allowed to rely on his contractual licensees to contribute towards the fulfillment of his obligations, on condition, of course, that, in the event of the licensees' failure to do so, the owner will be required to step into the breach. If the contractual licensee fails to fulfill one of his patent obligations, he is liable to sanctions, but so is the owner. The licensee could lose his license, and the owner his patent. In short, the patent owner cannot stand idle behind his contractual licensee as a means of evading his own statutory patent obligations; he must be prepared to come forward and take over from the licensee, or else face the statutory consequences.

In the case of a compulsory licensee, both the licensee and the patent owner have full obligations under the statute. To this extent, the compulsory licensee's position is the same as the contractual licensee's. The owner's obligations remain in full force, regardless of the compulsory license.

IV. POINTS ON NEW INVESTMENT AND THE TRAINING PROGRAM

24. Indonesia hopes that foreign private investment will improve the country's foreign exchange position as well as stimulate and strengthen domestic investment and domestic business performance. It also hopes that management of these new firms will find a mutual interest with Indonesia in developing the talents and participation of Indonesians.

25. At present Indonesia does not have any special technology transfer body or center to regulate the import of technology alone. The import of technology is a part of the import of capital, which is governed by the Foreign Investment Law of 1967.

26. For the purposes of that Law, foreign capital means:

(a) Foreign exchange that is not part of the Indonesian foreign exchange reserves and which with the Government's permission is used to finance enterprises in Indonesia.

(b) Equipment for enterprises, including new inventions by foreigners and materials imported into Indonesian territory, as long as the equipment is not financed from the Indonesian foreign exchange reserves.

(c) That part of the profits of the enterprise which on the basis of this Law may be transferred but is used for financing the enterprise in Indonesia.

27. Loan capital does not receive such benefits as tax exemption or other advantages. This attitude is taken in view of the fact that equity capital attracts technical skills and exerts the least strain on Indonesia's balance of payments. It therefore deserves maximum provision of incentive. The Government of Indonesia authorizes remittance of the funds needed for meeting various liabilities, and guarantees that they are in fact remittable. There are certain fields of activity in which either foreign capital is excluded or its use is contingent on vital public interests, such as the interests of national security.

28. The contribution of foreign enterprise and capital since 1967 has been of great benefit to the developing Indonesian economy. Much of this capital has been invested in the extractive industries, such as copper and nickel mining, and also in the production of oil. There has nevertheless been a meaningful contribution in many other fields of industry. This is both welcome and appreciated. The Government, by granting tax and other benefits to assist the projects in their formative years, has sought to ensure that the benefits will not be one-sided and that a fair return will be yielded for entrepreneurial activity.

29. Although the active contribution to the nation's economy is the most obvious contribution, three other factors are of great value.

(a) The introduction of new technical and engineering skills, many of which can be developed and imported into Indonesia.

(b) The importation of venture capital and the development of stable economic groups in which Indonesians can participate increasingly through the sale of shares.

(c) The introduction of entrepreneurial ability to establish and operate certain business ventures needed for development.

30. In the present state of the economy all three of these contributions are of about equal importance and weight. It is inevitable that in the course of time the importance of (b) and (c) will decline with the improvement of local financial resources and entrepreneurial abilities.

31. In the past, circumstances have brought about a situation in which foreign partners have had to assume a dominant share in many new enterprises. Current development and economic trends make some alteration of these circumstances necessary. This will not be unwelcome to far-seeing investors and to Indonesians alike.

32. Previous policy provided for a minor share for Indonesians in new ventures and for a planned program to expand their interest until a meaningful ratio was reached. In many cases this remained a minority interest.

33. More clearly defined rules will be issued on the basis of the Government Policy Statement of January 22, 1974. This Statement involves also an equitable distribution of opportunities for the various ethnic groups within Indonesia. Reference to these policies is made in a special publication.

34. The overall objective is that Indonesians should make a really meaningful contribution to their economic destiny. However, the transition must be accomplished within the limits of the managerial and technical skills available and without disrupting the development of the economy.

35. The final accomplishment of this policy will ultimately ensure that Indonesian participation in new and existing foreign ventures is not less than 51%. Although foreign capital will no longer automatically assume a dominant proportion of the equity of enterprises in Indonesia, the increasing pace of development will offer many rewarding opportunities to potential investors. It should also be added that, with increasing security, both political and economic, many of the risk factors for invested foreign capital will be removed, and the skill and expertise of foreign enterprises will be welcome in the following forms:

License agreements on the exchange of "know-how."

The sponsorship of new supporting, supply and service industries to support the needs of other foreign enterprises.

Participation even in restricted fields through license agreements, technical assistance contracts and even credit arrangements.

There will of course always be a welcome for genuine expertise capable of benefiting the country.

The achievement of the Government's objectives will require the active cooperation of investors on the following matters.

36. Equity

The foreign interested party should provide clear opportunities for Indonesian parties or Indonesian interests in general gradually to increase their equity participation. This would be done either by straightforward sales of shares or through the stock market.

37. Training Programs

The presence of a top executive, to represent the interests of the foreign participants for the whole period of the operation is acceptable.

Reasonable freedom would be granted in the organization of management and labor employment, including the bringing in of specialized expatriate personnel. This, however, would be on the clear understanding that whilst the investor concerned would provide a manning program for the establishment period, this would be followed by a steady phasing out of the expatriate personnel concerned.

An Adequate Training Program To Be Implemented for the Preparation of Suitable and Properly Qualified Indonesians To Take Over the Positions Vacated by Departing Expatriates

The objective of this program would be the thorough training of Indonesian personnel in the skills and disciplines essential to modern industry.

Here the interests of the Government would be represented by officers of the Department of Manpower and the Immigration Department. The training program, which would have the prior approval of the Board of Investments, would be used for reference in the granting of work permits and entry visas.

38. Development of Entrepreneurial Skills

This is a more intangible asset, which cannot be provided by a rigid training program. It requires the active cooperation of both the foreign and the Indonesian partners. The self-interest of both parties would lead to active collaboration on all aspects of the enterprise, and many of the required skills would develop naturally in the course of time. The foreign partner, by sympathetic understanding and assistance, could help to accelerate the process, but it has to be accepted that there should be equal sincerity on the part of the Indonesian partner(s) concerned.

It is important for the foreign investor to recognize that social and environmental conditions may very often require special adaptation on the part of the company and its expatriate personnel to cultural and other social trends. Active participation by expatriate personnel in local community life is therefore very much recommended.

V. EXPERIENCES IN INDONESIA

Promotion of National Technological Research and Development and Promotion of Technology Transfer

39. The main tasks in this field of the Center for Industrial Research and Development in Indonesia are as follows:

Technological Research and Development Facilities
(Technological Cooperation, Technological Promotion and Development Promotion).

Control (Standardization, Quality Control and Standard Implementation).

Technological Information (Research Administration, Documentation and Publication).

40. If we consider the objectives of research and development in science and technology, and technology transfer, in relation to accelerating the socio-economic development in Indonesia, we come to the conclusion that governmental control and promotion of technology and technology transfer are required if these objectives are to be attained.

41. As for technology transfer promotion, it could be implemented simultaneously or in stages, in a variety of forms. For example, the Government's selection data (see the selection of appropriate technology mentioned earlier) could be shared with national technology recipients, and perhaps also with foreign technology suppliers.

42. It would be possible, of course, to undertake foreign technology selection without technology transfer promotion, or vice versa, but the two programs do complement each other effectively.

43. In addition, the Government might care to go so far as to offer suppliers concrete fiscal and other incentives to bring their technology to Indonesia and transfer it to national enterprises. In all of these promotional activities, close liaison with government foreign affairs, tax and Central Bank authorities would be essential.

44. In order to facilitate the growth of national technological research and development capabilities, the Center will undertake the following activities, in consultation with the appropriate governmental authorities:

(a) utilization of the results of technology selections, to identify technological subjects and areas most suitable for national research and development efforts;

(b) offering to national technological institutions, programs and personnel of fiscal incentives, educational subsidies and other inducements for research and development;

(c) such other activities as the Center may, in consultation with the appropriate governmental authorities, consider most effective in order to achieve optimum stimulation of national research and development.

LICENSE AGREEMENTS AND ROYALTIES

45. Many technology transfer agreements have been concluded in Indonesia in the past few years, through such channels as: employment of individual foreign experts, technological expertise and assistance, supply of machinery, and license agreements; most of them, however, are license agreements comprising a combination of manufacturing know-how and technical assistance or services.

46. While there is an essential need for an influx of technology into Indonesia, there is also increasing awareness of the problems resulting from such unrestricted importation of foreign technology through licensing, and from the terms and conditions of license agreements. This is the reason for the emergence of a screening and selecting process in Indonesia, which is accomplished to a varying degree through the use of regulatory control or intervention, in the inflow of technology, such as required transaction terms, guarantees and prohibited transactions and transaction practices.

47. The Government of Indonesia has drawn up a list of industries in which foreign investment and technology transfer are not permitted. This list is also relevant to domestic investment.

48. When approving technology transfer agreements, due care is taken to ensure that no restrictive clauses are included, such as tie-in clauses that force the national licensee to purchase material and components from the licensor; package licenses, including patents that are not required; excessive

prices charged for the technology transferred; excessive lump-sum payments; increased royalty payment rates in line with increases in the recipient's rate of output, etc. This occurs most frequently in license agreements drafted by the licensor. They are examined case by case.

49. Indonesia has no clear regulations on royalty payments, the policy here being to allow foreign partners or licensors to pay tax-free royalties up to two percent (2%) of sales for five years. This was not the case, however, during the initial few years after the promulgation of the Foreign Investment Law in 1967, when several firms asked for high royalties, which were allowed with a view to attracting foreign investment.

50. On careful analysis, we arrive at the conclusion that, in the initial years mentioned above (until 1973), royalty rates ranged from 1% to 10% of net sales, the averages being as follows for the two periods:

51.	<u>Number of firms</u>	<u>Royalty</u>
	12 Textiles	1 to 10
	13 Metals & machinery	1.5 to 5
	9 Chemicals	2 to 7
	29 Miscellaneous	1 to 8

In 1974, 1975 and 1976 (June - end): Royalty/technical fee

3 Pharmaceuticals	2% for 5 years
3 Chemicals	" " "
7 Metals & machinery	" " "
2 Miscellaneous	" " "

52. All remittances of royalties have to be reported to the Central Bank of Indonesia.

53. Finally, we wish to express the hope that Indonesia, with its culture and its socio-economic and political setup, will be fully understood by its friends abroad. With this kind of understanding we believe that there can be no obstacles to hamper our genuine efforts to create sound and cordial cooperation between our people and our friends abroad, for our mutual benefit.

ENCOURAGEMENT OF INVENTIVENESS AND
INNOVATION IN DEVELOPING COUNTRIES

J. Zachariassen

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The most precious--and concurrently the most appropriately distributed--natural resource available in the developing countries is undoubtedly the human power of invention and innovation.

Nevertheless, so far it is still one of the least if not the least exploited asset of all.

In my view this situation of non-working (to use an expression from patent terminology) ought not to go on and need not go on any longer.

It ought not to go on because, genuine and sustained economic and social development being essentially a process from within, it cannot possibly take place only through economic priming and transfer of technology from technologically more advanced countries, however important these factors may also be.

The fundamental elements of genuine development include an active and constructive indigenous participation in, and control of, the choice and adaptation of imported technologies--and they include the indigenous development of new technologies.

This situation of non-working of the human powers of invention and technological innovation need not prevail much longer, since the processes of invention and innovation are now sufficiently well understood to be taught as subjects at universities and other educational establishments, in industry and even--in a basic version--to the common man, woman and child.

I shall shortly return to this latter statement and elaborate on it.

Who Are the Inventors?

Let us look for a while at who the inventors are, and what kind of environment they thrive in.

The references which I am now going to quote are exclusively from the industrialized part of the world. This fact, however, only makes the conclusion so much the more interesting from the point of view of developing countries. This you shall see in a moment.

Until recently it has been assumed, both by laymen and by governments, that in this era of highly sophisticated technology the bulk of new inventions in general and of significant inventions in particular are the results of teamwork between scores of--chiefly anonymous--scientists and engineers in large futuristic development laboratories of huge corporations.

However, a number of studies made during the past twenty years do not seem to bear out this assumption. On the contrary, the general conclusion of these studies is that in several major industrial fields the main initiative has come from independent inventors and smaller industrial firms, and in the latter case the inventor has quite often been the entrepreneur-manager himself.

I shall now quote a few of the more interesting findings:

In their book, Sources of Invention, Jewkes, Sewers and Stillermann (McMillan, II edition, 1969) showed that of all the important inventions of this century investigated more than half were made by independent inventors or in small firms.

A survey of British industry made in 1967 by Eiloart indicates that inventors from small-scale environments account for as much as some 80% of the notably striking inventions. Also according to Eiloart, the same percentage--that is 80%--of all technological breakthroughs are the result of 5% of the total expenditure on research and development.

If we now turn to specific areas within industry, I may start by quoting from M.J. Peck in his book, Competition in the American Aluminum Industry 1945-1955 (Harvard University Press, 1961), where he concludes that major producers

within the aluminum industry accounted for only one-seventh of the significant inventions in aluminum welding, fabrication and finishing.

The situation within the petroleum industry is described by Enos as follows: "If the most radical departures in thought have been made by inventors on the periphery of the oil industry, the least radical have been made by inventors working for the large integrated oil companies. Of all the major inventions in petroleum cracking only one was discovered by such an employee." All the other major inventions were made by independent inventors.

As far as the United States steel industry is concerned, D. Hamberg, who is quoted in an important book entitled Creativity and Innovation in Engineering (edited by S.A. Gregory and published by Butterworths 1972), claims that not one of the major innovations came from within that industry.

The same D. Hamberg expresses the provocative but not quite unfounded view that larger industrial laboratories are likely to be minor sources of major inventions and major sources of what he calls "improvement" inventions.

It is interesting to note that it has apparently been claimed in the case of only one industry that the majority of inventors come from the largest companies. This is the claim made by C. Freeman in his paper "The Plastics Industry" (National Institute Economic Review, November 1963). Nevertheless, W.F. Mueller, in his book, The Rate and Direction of Inventive Activity (Princeton University Press, 1962), states that, according to his study of eighteen new products put on the market by Du Pont, only five were invented by employees of the firm, while they shared in the invention of another one of the eighteen new products.

Also, it may be worth noting the decisive contributions of individual inventors in connection with such important materials as polyethylene (Ziegler), polypropylene (Natta), terylene (Whinfield) and silicones (Kipping).

In rounding off the subject of who the inventors are, I should like to give you a case history by briefly recounting the tale of my countryman, G.A.L. Thorsen, who invented the process of deep-drawing of stainless steel plates (for instance, for kitchen sinks and the like). He made the invention at a time when the leading technical universities of the industrialized world were teaching that such a process was impossible--both in practice and in theory. But Thorsen

did it and, when asked about his invention, which alone has brought him an income of millions of dollars, he used to say: "I just didn't know that it was impossible--that's why I did it."

As far as I recall, Thorsen's entire school attendance amounted to every other day during 6 years at an elementary village school. He started his adult life as a porter in a hotel, but, being of the entrepreneurial type, some years later he started a small mechanical workshop, where eventually he made his inventions and innovations.

Significance for Developing Countries

Now, what is the significance for developing countries of what I have been saying here about inventors? As I see it, it should be most encouraging to note that a very large part of all recent inventions--and not least of the significant recent inventions--made in industrialized countries have been made by independent inventors or in small laboratories, more often than not on a "shoe-string" budget.

In order to complete the picture, I must add, however, that many of the significant inventions originally made on "shoe-string" budgets have later been taken over by large firms, which were in a much better position to support the necessary development costs.

I feel certain, however, that in the developing countries there are thousands of people who in a climate friendly to inventors could succeed in making significant inventions and innovations--many of them because the inventor just did not know that his invention was impossible...

A Stimulating Environment

What then should a stimulating environment for invention and innovation look like?

It has indeed a great many facets. I shall try here in the very short time at my disposal to describe some of the more important of them.

Possibly, the most important of all is a socio-psychological aspect. It is the general attitude in society towards inventions and innovations. If everything new is invariably the work of the devil, it is--to say the least--very difficult and frustrating indeed to be an inventor and innovator.

Another essential factor is due recognition and remuneration of inventors, not just because it is clearly stated in the United Nations Covenant on Economic, Social and Cultural Rights, which came into force on January 3, 1976, but also because it has proved to have a tremendously stimulating effect, which is very much for the benefit of the community at large.

As indicated previously, a small-scale informal environment seems to be an inducement, on condition, however, that an abundance of channels of communication are open to the world around--that is, not only to colleagues but also to widely different sciences and technologies, to markets, exhibitions, at conferences in the home country and overseas--and also to the common man, whether he be factory worker, farmer or fisherman.

Reasonably easy access to relevant technological information is of paramount importance, and here I do not only mean patent abstracts and patents, which are often written in a language which is barely understandable for a great many very good inventors. What I would like to see, among other things, are special cross-profiles worked out in layman's language on available alternative products and processes especially relevant in developing countries. The profiles should include information on costs and degree of labor involvement. Such reference information usually is a very useful starting ground for an inventor. For the professional inventor who makes inventions to order, such basic information is a must.

Aspects of the Patent System

It is also essential that the patent system be adapted to the current needs of a developing country. In this connection I wish to mention the so-called "year of grace" which is practiced in the United States of America and a few other countries and which could be very useful if not essential to a novice inventor in a developing country, provided the necessary adjustments are made in the patent system.

The year of grace means that the inventor can freely manufacture, use, sell and in other ways publicize his invention up to one year before filing his application with the patent office.

In situations where the invention is a first-time invention and grows out of the mind and hands of the inventor,

often in response to the needs and encouragement of customers or the society at large, and especially so in the developing countries, it is generally unrealistic and also most unpractical to expect the inventor first to register his invention with the patent office before he shows it to and gets a response from his clients and the community.

At the present time, this year of grace appears in only a very rudimentary form in the Paris Convention, that is, in connection with specially recognized international exhibitions.

Therefore, so far, a patent application filed in a country on the basis of the year of grace excludes the possibility of patenting in other countries.

But maybe this is something worth looking into in connection with the revision of the Model Law, even though the suggestion may grate on the ears of many of those who have been brought up in the shade of the traditions of European patent legislation.

After all, the year of grace seems to have been a most stimulating element for US inventors, so why not also for inventors in developing countries?

I even know a good many European inventors who would want the practice of the year of grace eventually to become universally accepted.

Another feature which I feel is worth studying seriously in connection with certain types of more generally applicable inventions is a kind of inventor's certificate which contains the principle of the "license of right" and which is devised to suit market-economy countries as well as countries with exclusively State-owned industries.

I shall not at this time go into more detail regarding the role of the patent system. I would only express the wish that the subject be treated somewhat more inventively from now on than it has been in recent times.

The next group of important stimulating factors I want to mention consists of a number of aids to the development of useful and viable inventions.

These aids include, among others:

1. An independent technical-economical-environmental evaluation of new inventions.

2. Financial and technical assistance for making models, filing and following up patent applications, carrying out experiments and making prototypes and pilot plants.
3. Aid in securing the first customers and/or licensee(s) for the new products and processes.

Such aids may be channeled through a special invention promotion office or organization such as is found operating with a considerable measure of success in each of the Scandinavian and in a number of other countries.

Also, inventors' associations and societies for the promotion of inventions have proved to be important factors in the encouragement and carrying out of inventions and innovations. The International Federation of Inventors Associations (IFIA) has dedicated much effort towards the same ends at the international level.

Spreading the Knowledge of the Processes of Invention and Innovation

I shall now return to the question of spreading the knowledge of invention and innovation.

Bluntly expressed, there seems to prevail in the developing countries an almost total ignorance of the processes of invention and innovation. Yes, these are strong words, and I regret to say that even in the industrialized countries the state of affairs in this field is not very much better.

To substantiate my claim, I wish to quote a statement in the report of a special panel of experts set up to advise the Secretary of Commerce of the United States of America on the situation of invention and innovation in the USA. Less than ten years ago they said that there was an "abundance of ignorance about the processes of invention, innovation and entrepreneurship."

Today much concrete and freely available knowledge exists on the subject of this fundamental human activity.

It is my personal conviction and experience--based upon experiments that I and others have made with both children and adults--that the ability to invent and innovate lies dormant in a considerable part of the population. However, the vast majority of people--in developing countries as well as in industrialized countries--have never been taught

creativity and have never been sufficiently stimulated to practice their knowledge and further develop their creative faculties.

It is like learning to play the transverse flute. The first time you try, you may not even be able to get one single note out of it. But everyone can eventually learn to play that special kind of flute, although only a very few are gifted with genius in this field, as in any other field of human activity.

What the developing countries need is to foster, through their educational systems and otherwise, the dormant inventive and innovative talents of their people, the common people as well as the geniuses. No better investment can ever be made for the progress of a country.

Permit me in conclusion to submit a few concrete suggestions:

1. That WIPO embark on a program of informing policy makers in developing countries what concrete steps can be taken by governments to encourage and stimulate indigenous invention and innovation and what benefits may be derived therefrom.
2. That governments of developing countries work out plans for integrating encouragement and stimulation of appropriate indigenous inventions and innovations in the general development programs.
3. That teaching of the processes of invention and innovation be included in the curricula of universities, secondary schools and other higher educational establishments.
4. That in the developing countries there be established government-supported invention and technological innovation promotion offices or organizations, which will be outside the ordinary administrative hierarchy and routine.
5. That private societies be formed for the promotion of invention and innovation, with members from among inventors, industry and others interested.
6. That plans be set up for adequate recognition and remuneration to be given to originators of useful and appropriate inventions and innovations.

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7. That adequate financial means be established in each country to finance or help finance the development of promising inventions.
 8. That tax incentives be given to both inventors and those who take up local production of indigenous innovations.
 9. That technical standards and other formal requirements and laws be reviewed with the aim of removing any hindrance to the introduction of appropriate technological innovations.

I could continue for quite a while mentioning many further suggestions. I hope, however, that what I have said already may have encouraged--or perhaps even in a friendly way provoked--some of you to approach the questions of inventions and innovations more inventively in the future.

JOINT VENTURES IN INDIAN INDUSTRY

S.P. Godrej

Chairman
Godrej Companies
India

Before embarking on my main subject, I would like to briefly touch upon the patent system. As one of the largest manufacturers in the East of office furniture and security equipment, my association with patents goes back many decades. We, in Godrej, have found patents to be very useful. We not only patented 36 of our inventions but also made them popular by running a profitable business on mass-production lines, thus providing much-needed quality products at reasonable prices.

Dr. Vedaraman, who spoke yesterday, has already elaborated on patent rights in India, for which the first Act was passed in 1856. The Patents Act of 1970 not only recognizes the importance of stimulating inventions and encouraging the development and exploitation of new inventions for industrial progress in the country, but at the same time ensures that patent rights are not abused. An important feature of this Act is the special provision relating to inventions in respect of life-saving drugs and medicines, chemicals and food, as the Government feels that it is not healthy to grant a long monopoly for these products. Economic and social aspects as well as the exigencies of changing times are taken into careful consideration while seeing that the patents are utilized to benefit the whole country and not only one individual. Towards this objective, and bearing consumer-interest in mind, the Act encourages and promotes widespread research to produce quality goods on a mass scale at reasonable cost. The 16-bend safe made and patented early in this century serves as another good example in Godrej. The scientific bending of sheet steel not only helped reduce the cost but also provided greater strength and security and, due to its larger usable space, the new design also proved more beneficial to the customer than the old cast-shell safe. Based on the same principles, Godrej also designed and patented the popular and widely used Storwel cupboard, which is of special significance in a country like India, where one can take pride and feel secure in owning at least one important item when most people have even to share a room.

Transfer of Technology

This leads me on to a major aspect of industrial growth, namely, transfer of technology. Here, patents do not play a predominant role, due to the fact that many mutually beneficial collaborations do not involve the buying of patent rights. It has been found that the advanced technology of the developed world cannot be simply transferred, that is, bought beneficially by the developing countries. The extent to which sophisticated technology, which is mostly mass-production oriented, can be transplanted to the developing countries depends on the degree of industrialization of the particular country. It is to carry out such a successful transplant that efforts are being made to bring about a new international economic order, keeping in mind the ultimate interests of developing societies.

Unfortunately, such efforts, even under the aegis of UNCTAD, have not achieved the desired results. Prime Minister Indira Gandhi pin-pointed the issue at a recent meeting of UNIDO at New Delhi when she said that efforts to transfer technology and resources should be strengthened, but, "regrettably, this is not only not being done but there are diversionary moves to create institutions, which would mean that the speed, quantum, terms and conditions of transfer remain largely in private commercial hands, especially those of multinational corporations." Commercial transfer of technology has also led to overpricing of imports. No less important is what has been described by Gunnar Myrdal as "non-transfer" of technology, which, in India, has been partly responsible for the repetitive import of technology.

According to the latest estimates, the gross value of the industrial output of the developing countries in 1975 was only 7% of the world output. To achieve a 25% share as suggested by UNCTAD, an investment of 1880 billion dollars would be required, of which about 800 billion dollars would have to be in foreign exchange to cover the cost of imported machinery and equipment. From 3 to 5 billion dollars a year were paid for technology. If that continues, it would rise 20 to 35 times by the end of the century. There is the prospect of a staggering 20% annual rise in the technical imports bill. Noting this, Mrs Gandhi has called for institutional initiatives in the transfer of technology and resources at a reasonable cost "at a price within the means of recipients." Abiding concern with lasting gains, rather than expediency, must remain the basic principle of growth.

Why Joint Ventures?

One important element of the new economic order is the establishment of an "integrated programme of economic co-operation." In today's rapidly shrinking world, multinational co-operation has emerged as one of the basic necessities for international co-existence. UNCTAD has rightly pointed out that "emphasis should be shifted decisively from trade matters towards joint endeavours in the development of regional, industrial and agricultural resources."

The establishment of joint ventures is considered one of the best forms of economic co-operation, which enables both the investing country and the country where investment takes place to derive the benefit of greater specialization and diversification of the production structure by efficient allocation and utilization of available resources. By this approach the collaborating countries combine their resources, capital and equipment, industrial and managerial skills and technical know-how, and thereby contribute towards each other's economic development.

Foreign Investment in India

It must be said to its credit that the Union Government has not lost sight of the importance of keeping abreast of the latest technological advances in developed countries. Whilst India's policy is to remain self-reliant, no nation in the world can claim to be self-sufficient in all respects, and the flow of talent, materials and technology from one country to another gives rise to interdependence and increasing international trade.

Initially, the advanced countries set up plants for consumer goods to avoid payment of import duties. Next, chemical, petroleum and other such industries started to move in. Subsequently, as wages increased, even clothing and electronic parts industries advanced into Asian countries. Finally, even Japanese heavy and chemical industries came in due to rising land prices and pollution in Japan. As Mr. Nayak's paper has so graphically covered the various industries in different categories, I need not go into details again.

The experience of investors from developed countries over a very long period of time has been, on the whole, very satisfactory in that there has been no difficulty in repatriation of funds. However, as Mr. Nayak has lucidly explained earlier, proposals for joint ventures by investors from developed countries should conform with national goals.

While considering applications for foreign collaboration, the importance of avoiding repetitive import of know-how for the same or similar products or processes is kept in view. Priority is also given to specialized technology and export-oriented sectors.

A general complaint of foreign investors has been time-consuming procedures and the uncertainty in their minds as to what terms would be acceptable to the Government. In order to avoid undue delays in the disposal of applications for foreign investment/collaboration and in order to streamline the various procedures, the Government of India has established a single agency within the Government called the Foreign Investment Board. Once the entry of foreign capital or technology has been approved, the foreigner receives the same treatment as Indian enterprise and capital.

A united secretariat for industrial approvals, including foreign-collaboration approvals, called the Secretariat for Industrial Approvals, has been functioning as a division in the Ministry of Industry in order to ensure clearance within a definite time limit.

Although India has taken giant strides industrially, it has still to develop much further in certain areas of technology besides expanding its activities in all fields to cater for the growing requirements of its huge and growing population. Here I would like to appeal to the advanced countries to come forward and co-operate on mutually beneficial terms, including the matter of patents, where they may be required. But, at the same time, as technology in the advanced countries is developing rapidly, their constraints on transfer and use of patents should not be for inordinately long periods. Besides, the cost of technology should have some relation to the cost of the venture as a whole and to the nature of the market. In this way, new markets could be developed within and near India by effecting exports.

What India Can Offer

The scope for Indian collaboration, both in the developing and in developed countries, is promising. The possibility, however, is greater in co-developing countries, particularly because of the similarity of socio-economic conditions. The intermediate technology that India has acquired over a long period, through forced circumstances and through trial and error, is neither capital-intensive nor very sophisticated, and is thus more relevant and

suited to the needs and requirements of developing countries. Only recently, Mr. Orville Freeman, President of the Business Industrial Corporation of the USA and Joint Chairman of the Indo-American Business Council, pointed out that Indian technology and know-how were particularly suited to meet the ends of developing nations.

India has the third biggest cadre of technicians in the world after the USA and the USSR. We have acquired a reputation for technical skill and can also provide technical services at rates cheaper than those charged by the developed countries. Furthermore, Indian management personnel can adapt itself far more easily to societies not very different from its own. Side by side, with technical expertise acquired over the years, marketing techniques combined with efficient after-sales service--as successfully practised in India--are being sought to keep pace with modern requirements. Greater attention is being paid to research and development, and value engineering has been assuming greater importance. There is also a growing realization of the need to ensure training facilities for the nationals of the countries where the investment is made, so as to enable them to ultimately assume the management of the operations under the project.

In the advanced countries of Europe, America and even in Japan, labour-intensive areas are being vacated because of their becoming uneconomical. Japan, West Germany, Italy, France and the USSR have already evinced keen interest in having Indian collaboration for the manufacture of items where the labour content is high or where India has a comparative cost advantage because of the availability of abundant raw material.

Till recently, the Indian Government has been permitting export only of equipment and know-how but not of capital. Equity was reckoned only against equipment. However, it is now reliably understood that, with the improved foreign exchange reserves position, the Government has decided to effect an important change in the present policy governing the establishment of joint ventures abroad. It will now permit Indian promoters to contribute a part of their share capital in cash up to 20%. This relaxation, which is expected to go a long way towards improving the viability of joint ventures will, however, be applied in a selective manner. As far as the Indian Government is concerned, minority participation by the Indian promoter is favoured. In fact, in over 90% of our joint ventures abroad, Indian investment is on a minority basis.

In recent times there has been a good rapport between Government and industry, including private enterprise, and the impediments to the quick clearance of joint venture projects have diminished. To help Indian entrepreneurs abroad, more branches of Indian banks are being opened. The new policies of the Government have also boosted the remittances from people of Indian origin abroad, thus reflecting the strength of Indian currency and economy. Several institutions, such as the Indian Institute of Foreign Trade, have also been lending a helping hand not only by conducting extensive market surveys and preparing detailed reports on the needs of individual countries but also by imparting specialized training in the field of international trade. Added to all this, there has been a tremendous increase in tonnage for shipping, and air-freighting facilitates export by reducing delivery time.

Our Achievements

The number of Indian joint ventures abroad has been steadily increasing. It has gone up from 162 to 268 in three years. Indian entrepreneurs have also concluded technical-collaboration agreements, such as the one in Argentina for manufacturing reactive dyes and optical whiteners, and the other in Iran for bicycles. My company, Godrej, are supplying the know-how for the manufacture of fatty acids in Iran. This agreement includes the establishment of a suitable quality-control operation and the know-how for the marketing of all types of fatty acids in different parts of the world.

India is now co-operating with over 30 countries in supplying technical as well as scientific information in addition to the preparation of techno-economic surveys, feasibility reports and detailed project reports. By the end of 1974, as many as 339 Indian experts were working abroad under the Indian Technical and Economic Co-operation Programme. Nepal and Bangladesh, two neighbouring countries, have received a great deal of aid in economic and technical co-operation.

Industrial projects have been prepared for Libya, Oman and Dubai. Besides, India has co-operated with Afghanistan in setting up a children's hospital as well as an agricultural extension scheme. The Engineering Projects of India (EPI) last August won a spectacular contract to build a modern integrated township near Kuwait. It is the first Indo-Japanese venture in a third country. While Pacific Consultants International of Japan will provide

the engineering and architectural services, most of the material for the project will be shipped from India and about 6000 persons from India will find employment. The major work of the entire construction management will be done by EPI. Another private construction company is already building an international airport at Kuwait in association with a Dutch company. Contracts to build a mini-steel plant in Guyana, a rolling mill in Yugoslavia, a sugar plant in the Sudan and an airport in Iraq are also under negotiation.

A private-sector company, Dastur & Co., has commenced work on industrial projects in Syria, Morocco, Algeria and Abu Dhabi.

It is not only in the field of engineering that Indian business has been able to set up joint ventures abroad. For instance, Gwalior Rayon is setting up a Rs. 140-crore industrial complex in Malaysia for staple fibre, wood pulp and allied industries. To take another example, one of the leading sugar machinery manufacturers is setting up a sugar project in Tanzania.

Indian joint ventures thus encompass a vast array of industries such as cotton, woollen, rayon and synthetic fibre textile mills, oil mills, sugar mills, cement factories, light engineering, bicycles, fans, sewing machines, air-conditioners, steel furniture, re-rolling mills, tractors, fertilizer complexes, oil refineries, pharmaceutical projects, hotels and restaurants. India is also capable of providing infrastructure.

India makes practically everything for consumer and other needs. India is particularly equipped for co-operation in handicrafts and small-scale industries, especially rural ones. I must particularly mention here that the Government does not permit the export of second-hand plant.

In passing, I may inform you, having been connected with the first joint venture by any developing country in any field in South-East Asia, about the difficulties my firm faced in the initial stages in Malaysia over 15 years ago in setting up a factory there. It was an uphill task, for, first and foremost, Malaysia was closely linked with an advanced country and some people there were not sure that India could offer know-how and put up factories in that country. However, matters were sorted out after the visit to India of the Malaysian Industries Minister. He

was so impressed by our manufacturing facilities that he remarked that what he saw would be more meaningful only if a plant were set up in his own country! This has been followed up by Godrej manufacturing its products in Singapore and, now, a beginning has been made in Indonesia. At present there are 20 Indian joint ventures set up in Malaysia. In this connection, I feel that it is most desirable that our friends from abroad should visit the many modern industrial plants in India to see for themselves the progress made by the country.

Research and Development (R&D)

Indian industry is striving to keep pace with the latest advances in technology. To encourage research and development, the Government is extending facilities for import of raw materials and equipment. R&D enables absorption of technical development not only from outside the country but also through national laboratories and research institutes. This brings me to the point that India is a very individualistic country and therefore with its original culture and vast human resources has contrived to make its own contribution in the field of science and technology.

Design Policy - Its Economic Aspects

A design policy should be formulated considering its use to industry and the country at large. In a comparative market, an industry's existence depends on the quality of its products. Hence, industries have to ensure that they produce "well-engineered" products. Incidentally, innovation, because of recession, is a subject in itself. In crossing the first stage of industrialization, India depended almost wholly on foreign collaboration. The late Dr. Homi Bhabha said: "In India, industry has borrowed technology not only at the time of being originally established but also on each occasion of expansion and diversification. It is necessary that a more concentrated effort is made to improve the balance between local and foreign effort in the second stage of our industrialization drive. One cannot build a sound policy of industrial development on borrowed technology in the long run. The seeds of further development have to be down in our soil."

Design and engineering must take cost into account. Its primary goal is usually to get something built that is within a certain prescribed cost. Usually time prevents an elaborate search for the most economical design.

Consequently, progressive companies in India, particularly those engaged in high-quality production, are introducing value-engineering to search for ways of getting equivalent value at lower cost.

Any design policy in a developing economy ought to give sufficient importance to import substitution. Before independence we were importing practically everything from industrialized countries. One cannot change this situation overnight. But there is ample opportunity for developing substitute products, and over the years India has learnt to innovate designs to suit the requirements of Indian conditions and also of overseas markets.

One excellent illustration of innovative design is a certain type of footwear called the "Kolhapuri Chappal"--an elegant article of everyday use for the élite as well as the masses. These chappals have found a large market in India and many countries abroad. The design is very simple, attractive, functional, low-cost, long-lasting and very suitable for hot-weather conditions.

We, in Godrej, have established a Design Centre to develop new products and to provide economic benefits for customers, besides providing an aesthetic appearance. A good example, as I have already mentioned, is the 16-bend Godrej Safe, designed and patented many years ago. The Godrej Typewriter may be cited as another example. Although, in the manufacture of typewriters and forklifts, foreign technical assistance was initially taken in order to save time, the production is now indigenous in every sense. Machine Tools is yet another sphere of design and research activity at Godrej. The redeeming feature is that such efforts are increasing and there is now a greater consciousness in Indian industry of its need. Certain steps taken by our Government, such as income-tax relief and greater control over all renewals of know-how agreements, have helped this healthy trend.

In conclusion, I would like to stress that our primary objective should be human solidarity and world peace. The relationship between the haves and the have-nots should be one of understanding of each other's limitations. Whereas tariff barriers are being tackled effectively, it is the non-tariff barriers which threaten to get in the way of the developing countries. Joint ventures should be embarked upon with a view to promoting trade and not with a view to giving aid. India believes in settlement by negotiation through UN agencies in conformity with the aim of accelerating economic, social and cultural development, thereby

achieving a fair and just international economic order. India is collaborating in the Technical Assistance Programme of the United Nations, the Commonwealth Assistance Programme for Africa and the Colombo Plan, apart from the other international agencies.

FOREIGN INVESTMENT IN THE INDUSTRIALIZATION OF THE
PHILIPPINES

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The Philippines today contemplates a program for economic growth which would require an increasing contribution from the industrial sector. For the past years, industry has been slowly catching up with the agricultural sector, which is the main contributor to the country's GNP. The share of the industrial sector (mining, manufacturing, construction and utilities) in the net domestic product rose from 23% in 1971 to 29% in 1976. On the other hand, the share of agriculture, fishery and forestry declined from 38% to 31%.

It may be seen that, as a basically agricultural country, the Philippines has, since its independence in 1946, adopted various strategies for industrialization. With a population growth rate of approximately 3%, realistically, the agricultural sector cannot continue to provide employment to meet its fast-growing population, agriculture being limited by the available arable land.

Foreign investments have played a meaningful role in the industrialization of the Philippines, not so much in terms of the equity they originally brought in, but in terms of the technology accompanying the equity. That this has facilitated the country's industrialization as well as indigenous technology triggered by ancillary industry may be gleaned from the foreign investment studies made by the Board of Investments and the Central Bank of the Philippines in 1970. Of the total of 1,466 firms surveyed, 900 came from the 1,000 largest corporations in the country. These 900 firms accounted for 94.4% of total sales of the 1,000 largest corporations in the country. Of the 900 firms surveyed, there were 415 firms with foreign investors, and 280 firms out of the 415 firms had foreign equity to the extent of 60% or more.

Foreign investment in the 415 firms represented 39.7% of the total equity of the 900 firms. The bulk of foreign investment surveyed went to the industrial sector, particularly to the manufacturing and mining sectors. In 1970, 57.7% of foreign investment went to manufacturing and 14.5% went to mining. It is evident, therefore, that the participation of foreign investors is concentrated more in the field of industry than in any other sector of the economy. Perhaps this structure of concentration of foreign investment in industry is understandable in the light of the Constitutional limitation of foreign equity in landholdings and exploitation of natural resources. In the case of mining, while there are limitations on the exploitation of natural resources, the processing aspect of mining has not been limited to Philippine nationals.

No doubt, foreign investment has played and is expected to play a role in the industrialization of the Philippines. Unlike the past, however, when foreign investors were alone in determining their respective role in the economy, the Government now formulates the rules of the game. It is our guiding policy that foreign investment should supplement rather than displace domestic capital. By identifying the areas where foreign investment would be welcomed and encouraged, Government policy has been directed to the recognition that foreign investment is an effective tool towards development and, if properly directed, could be beneficial to the investor and to the host country. The country is ever in need of additional capital, technology, special skills and other benefits that go with foreign investment. While the Government has in the past left to the private sector the responsibility of deciding in what activity to invest, it now acts as a catalyst to channel investment into desirable areas, taking into account our national priorities. It is understood that foreign investors should have an opportunity to earn a reasonable rate of return on investment and should have guarantees for their investment. In return for this, foreign investors are expected to make good their commitments and their representations to the host country.

Industrialization Policy

The Philippines is in the midst of an industrialization program intended to achieve expansion and restructuring of industry so as to increase industrial output and to distribute wealth equitably among the population.

In the pursuit of these objectives, the Government has adopted the following strategies: (1) promotion of labor intensive industries; (2) development of small and medium scale industries; (3) regional dispersal of industries; (4) encouragement of non-traditional manufactured exports and further processing of traditional indigenous raw materials before exportation; and (5) development of intermediate and capital goods industry.

The first strategy is evident in the requirement of the Board of Investments that projects for incentive availment must meet a labor-to-imported-capital-equipment ratio of not more than \$4,000 per worker. Tied up with this strategy are local content requirements set by the Board as a prerequisite for continued enjoyment of benefits. With these requirements, we hope that imported technology will be brought in or indigenous technology be developed.

The second and third strategies are intended to bring progress to the rural areas and underdeveloped regions of the country. At present, there is an over-concentration of industries in the Greater Manila area, which has resulted in congestion and pollution and deprived the countryside of development opportunities. The Government has now adopted a policy that no new industry should be set up within a 50-kilometer radius of Manila and has set up industrial estates in other regions of the country. There are also liberal technical and financial assistance to small and medium scale industries and tax incentives for cottage industries. At the moment, we have a project for transferring urban technology to rural areas after adapting it to local conditions.

The fourth and fifth strategies are intended to solve our recurring balance of payment problems by increasing export earnings and by import substitution of locally manufactured intermediate and capital goods. Thus our copper smelting project has been set up by a consortium of mining companies using imported technology, shipbuilding projects with Japanese and Norwegian technology, etc. Tied up with these strategies is the employment generation objective of industry.

Foreign Investment Policy

In the light of the Government's industrialization policy as declared above, it is the objective of our foreign investment rules and regulations to direct foreign investment towards inadequately exploited areas which have been identified in our priorities plans as economically viable and necessary

for economic development. At the same time, it is intended that foreign investment should not be allowed in activities which are already adequately exploited by Filipinos or where overcrowding may result in unnecessary competition and friction between domestic and foreign investors.

In line with the above basic objectives, we have declared areas where foreign investment can come in freely, with incentives, either alone or in joint ventures with Filipinos. We have drawn up a list under the so-called "Nationalization Law" (now aptly called "Filipinization Law") which sets maximum foreign equity at between 40% and 30% in fields such as exploitation of natural resources, landownership and banking, and in areas where foreigners are not allowed at all, i.e., rural banking, mass media and retail trade. From time to time, the Board of Investments (BOI) limits the entry of foreigners in overcrowded activities, such as wholesaling, to 30% equity for the protection of Filipinos and foreigners alike who are already in the particular business. Foreign investment which represents 30% or less of the capital stock need not secure prior BOI approval.

Whether the entry of foreign investment is without government incentives or not, all foreign investment, of whatever percentage, has to be approved and registered with the Central Bank, primarily for foreign exchange monitoring purposes and for facility in repatriating capital and remitting profits.

Incentives

To encourage the flow of investment in the industrial sector, the Board of Investments produces each year three (3) priorities plans which list the economic activities to be encouraged for that year with incentives. The Investment Priorities Plan covers mining, manufacturing, and agro-based industries with specified additional production capacity desired to be established for each activity. The Export Priorities Plan covers domestic export processing activities for which producers and traders can obtain incentives. The Public Utilities Priorities Plan includes service industries to support the manufacturing sector.

The activities listed in the plans are classified as "pioneer" or "non-pioneer." The pioneer activities are those whose products are not yet manufactured in the country or which use technology or processes new to the country. Non-pioneer activities are those which do not meet the tests of pioneer projects but for which additional production

capacity is deemed necessary and should be encouraged with incentives. Pioneer activities receive more incentives and are generally open to 100% foreign equity, subject to the requirement to sell to Filipinos the controlling shares within thirty (30) years, or forty (40) years in the case of export manufacturing enterprises.

Registration with the Board of Investments under any of the listed activities entitles the enterprise to a package of incentives in the form of tax holidays and non-tax incentives. For the investor, in addition to capital gains tax exemption, industrial property rights registered with the BOI are covered by a guarantee. No investors have as yet availed themselves of this incentive because of the ample protection of our patent system, which is an age-old institution in the country. The registered enterprises, in addition to the usual guarantees as regards expropriation, are entitled to the following incentives:

1. Non-Tax Incentives

Enterprises are given the right to employ foreign nationals, without limit as to number in the case of pioneer enterprises and, in the case of non-pioneer enterprises, only in supervisory or technical positions not in excess of 5% of each category for the first five (5) years of registration (5 years from operation in the case of pioneer enterprises). The enterprises have the right to request the banning of imported items which unnecessarily compete with those produced by such registered enterprises. In addition, they are protected from government tax and duty free importation of products similar to those produced by the registered enterprise, have preference in government loans (for Filipino-controlled firms), and are entitled to private financial assistance by authorizing insurance companies to invest in registered enterprises without the regular dividend requirement for investment by insurance companies.

2. Tax Incentives

Registered companies are entitled to tax incentives in terms of additional tax deductions from taxable income, tax exemptions, deductions and tax credits on capital equipment, raw materials, etc.

Special Incentives Schemes

In addition to the incentives offered by the BOI for activities listed in its priorities plans, there are special incentive schemes available to foreign investors on the

basis of location, such as those provided by the Export Processing Zone Authority (EPZA) and PHIVIDEC Industrial Estate. The incentives in these zones or estates are basically the same, i.e., exemption from import tax on equipment and raw materials, with the Export Processing Zone enjoying incentives almost similar to BOI incentives, and both having the advantage of available land, factories and infrastructure facilities.

Recently, a law was enacted prescribing incentives for regional or area headquarters of multinationals. A regional or area headquarters is neither a branch nor a subsidiary. It is merely an administrative branch of a multinational which principally acts as a supervision, communications and coordination center for the subsidiaries, branches or affiliates of a multinational company in the Asia-Pacific region. It does not earn or derive income from the host country, remitting not less than \$50,000 annually and paying its foreign executives at least \$1,000. All its expenses are financed by the head office or parent company. Such regional or area headquarters are not supposed to earn any income, hence are exempted from the following: income tax; the 3% contractor's tax; local licenses, fees, dues, imposts, or any local tax or burdens. Its alien executives enjoy multiple entry special visas, exemption from fees under the immigration and alien registration laws, clearances, and customs duties and compensating tax for personal and household effects, including a motor vehicle, which they bring into the Philippines when they settle for the first time, and are subject only to 15% tax on gross income paid in the Philippines by the regional headquarters.

Other Special Incentives Schemes

Specific incentive laws applicable to certain industries such as petroleum exploration, mining, tourism, shipping and shipbuilding, sugar, coal, cottage industries and cooperatives have been enacted.

Technology Transfer

Traditionally, technology has been transferred to developing countries as an integral part of foreign investment. In the formulation of our priorities plans, one of the criteria for listing as a preferred pioneer industry deserving of incentives is the use of new technology to produce a new product in the Philippines or the adoption of a process which is new and untried in the Philippines, provided that the final product will involve substantial

use and processing of domestic raw materials, whenever available. The BOI has rejected projects using a technology which is not proven, or has conditioned approval of projects on the submission of a foreign technology tie-up when local technology is not available.

1. Licensing Agreements

When transferred technology is the subject of a licensing agreement, before any remittance of royalty is made, the agreement must be registered with the Central Bank of the Philippines, after consultation with the Board of Investments (BOI). The BOI in evaluating licensing agreements takes into account three (3) factors: essentiality of the technology and/or trademark to the industry, reasonableness of the royalty and other costs for such transfer of technology, and restrictive business provisions in the contract.

With respect to the first factor, the Board of Investments looks into the availability of such technology locally, to determine whether the industry is in the priority plans of the BOI or is not included in the overcrowded industries list prepared by the Investment Coordinating Committee. The duration of the contract should not be so unusually long as to tie the licensee to payment of royalties although the technology may already be obsolete. Without a time constraint, a local licensee will not exert any effort to undertake its own research to improve its products and will be forever dependent on the improvements made by the licensor. On the other hand, an unusually short duration may not make it worth while for the licensor and the licensee may not have sufficient time to absorb the technology.

Determining the reasonableness of the royalty rate has always been a difficult task. The process, the essentiality of the product, availability of alternative technology and other terms such as raw material and equipment purchase tie-up, and availability of improvements by licensor to licensee, are among the factors to be considered in determining the reasonableness of the royalty.

The most common clauses considered prima facie as restrictive business practices by the Board of Investments are:

1. Direct or indirect restrictions on exports whether or not protected by patents in other markets (e.g., higher royalty for export sales, prior approval of licensor before

exportation, restrictions on level of production, fixing prices for goods manufactured by licensee).

2. Restrictions as to the use of the subject matter of a patent and any unpatented licensed know-how which directly relates to the working of the patent once a patent has expired. Restrictions or a prohibition on the use of know-how after termination or expiry of the contract (exceptions would be necessary where early termination of the contract took place on account of breach of the contract by the licensee).
3. Restrictions in obtaining patents and know-how or trademarks from other licensors with regard to the sale or manufacture of competing products.
4. Obligations to use the distribution channels or staff of the licensor.
5. Insistence by the licensor that the law of his country govern the contract.

Under our present guidelines, only overwhelming economic and industrial justifications can warrant registration of licensing agreements which are not in conformity with the aforementioned regulations.

2. Contracts for Supply of Machinery and Turn-Key Contracts

Operational technology, particularly for small-scale projects or even for big projects where no proprietary processes are involved, such as textiles and cement, are transferred by means of equipment supply contracts. For preferred projects registered with the BOI for incentive availment, as a fiscal measure, before an entity can avail itself of tax exemption and deduction or deferment in respect of capital equipment importation, public bidding is required unless there is only one (1) known manufacturer of the machinery, the total cost of importation is less than \$1 million and the Board has other means of determining the reasonableness of the procurement cost.

In turn-key arrangements, technology is transferred with the entire plant to be set up either by the owner of the technology, the equipment supplier or the consultant engineering organization. Although there is an advantage in dealing with only one person who will turn over the plant to the local buyer of technology, there may be disadvantages in

such arrangements, particularly as regards the cost, which normally would be higher than the cost for contracting separately for technology transfer and other services. As regards the incentives from the Board of Investments, the taxes for which the turn-key contractor would be primarily liable even if passed on by contract to the local entrepreneur registered with the BOI for incentive availment may, in some cases, not benefit from any incentives since tax exemptions generally accrue to a tax-exempt entity only if it is primarily liable for the tax. Moreover, in turn-key arrangements, local fabrication of equipment which benefits from incentives under the BOI law may not be encouraged by such package arrangements.

3. Service Contracts

The use of foreign experts to effect transfer of technology is often included in other modes of technology transfer such as licensing agreements and equipment supply contracts. It may also be a separate means in itself, particularly where no protected industrial rights are involved. This is most common in medium and small scale industries, engineering industries, food processing and other consumer goods industries. Service contracts on a bigger scale are now prevalent in the exploration and exploitation of natural resources to enable use to be made of foreign resources to hasten discovery of indigenous petroleum and other mineral resources without violating the Filipino-equity requirement in the Constitution in these business activities. In the case of the former, approval of the Energy Development Board is required, while, in the case of the latter, that of the Secretary of Natural Resources is necessary. It should be pointed out that, under our Anti-Dummy Law (Commonwealth Act 108, as amended), no foreign national may intervene in the operation and management of firms engaged in nationalized or Filipinized activities except if the entry of foreign technicians is authorized by the Secretary of Justice. The above-mentioned service contracts are exemptions provided for by the Constitution and implementing decrees. In addition, firms registered with the Board of Investments for incentive availment can employ foreign nationals for a period of five (5) years. It is important that such foreign experts should have understudies and should be employed only for a limited duration, considering the high payroll costs for expatriates and social problems emanating from such practice in labor-surplus economies such as ours.

Foreign investment is very much a participant in our industrialization. Understandably, we have to pay the "costs" that normally go with foreign investment. It seems fitting, therefore, that the Government should specify in what areas its use can be optimized and to limit its operation in these particular fields.

PATENT STRATEGY AND THE DISSEMINATION OF TECHNOLOGY
BY THE MULTINATIONAL ENTERPRISE

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1. The Role of the Patent Expert in the Technology
Dissemination Process

The average patent expert in industry spends very little of his time on the problems of negotiating patent licences and on the contractual aspects of technology transfer. His time is spent principally on three activities. Firstly, in understanding technology that has to be used and then searching the technical patent literature to ensure that any patent licence requirements are evaluated. Secondly, and usually in respect of new technology developed by his employer, he is kept busy describing it and working towards its eventual publication in an accepted patent specification which hopefully will afford some protection. Thirdly, the mere possession of technology does not necessarily imply that one must obtain protection and the patent expert has to determine whether to seek patent rights and when to abandon existing patent rights because, in general, patents are seldom kept alive for the full potential period of grant.

Instead of obtaining patents for every possible invention of value, it may be sufficient to secure freedom of action to use the technology. This means publishing the technology. IBM, for example, publish about 2,000 such technical disclosures every year and distribute these in Technical Disclosure Bulletins sent to libraries in 33 countries. The number of their inventions which become the subject of patent applications is less than one-third of this figure.

The business of the patent expert is therefore to understand technology, to disseminate technology and to protect technology. If there were no patent experts there would be no specialist profession whose business it was to

probe into the minds of the creators of technology, to extract information and to publish that information. Patent experts are, almost like journalists, amongst the most prolific of authors because nearly everything they write in a patent specification is eventually published, sometimes in several languages.

However, patent experts really need to have a thorough understanding of the inventions which they are protecting. In their early career they therefore need technological training because they too were once in the "developing" state. It is easier to understand the problems of transferring technology between nations if the problems of transferring technology between people and the development of people are better understood.

2. The Problems of Documenting and Communicating Technology

In my early career, after training at University as an engineer, I joined a major electrical manufacturer in the United Kingdom to learn the basics of their industry by serving a two-year graduate apprenticeship. In such an apprenticeship I worked alongside graduates, some from the developing world, who would spend sometimes a day, sometimes a week, sometimes a month, in different parts of the company's manufacturing plants, participating first hand in the various manufacturing processes which make up the whole of the heavy electrical industry. Such an apprenticeship is the best way to get first-hand general technological experience.

One of the important lessons which I learned at that time was that the co-operative skill of the engineer and the technician (the creator and user of technology, respectively) is put to its true test not when everything goes right but when things go wrong. The working instructions generated in a design office can contain mistakes. The skilled man on the shop floor is accustomed to exercising his own initiative and co-operating with the engineer in dealing with such situations.

The other important point which I learned first hand was that Management seldom understand the technological details of the processes or even skills which they are managing. At one stage in the two years' service as a graduate apprentice I was assigned to a department which was seeking to establish process specifications describing the manufacturing and assembly techniques in use. The company had realized that nowhere in the organization was

there any documentation describing how certain jobs were done and that the skill could rest often in the hands of two or three specialist employees, some of whom were not too far from retiring age. To safeguard continuity of the process, the idea was to write up a detailed specification of what was involved so that this could be kept on record in case of need. This was nearly thirty years ago. The problem was not one of developing and disseminating new technology but one of keeping track of old technology to avoid losing it. I am speaking here of processes which were not automated, and it may sound antiquated, but, if you look at the most modern fully automated system, governed by the fullest design specifications, there is the inevitable burden of technical updatings as manufacturing changes are implemented and the process line expanded at multiple locations. There is considerable scope here for all kinds of errors, misunderstandings and communication difficulties, even within the same enterprise. All this makes technology transfer a very complicated process.

Management seldom have within their power the ability to transfer a particular item of adequately documented technology to anyone. Some physical transfer of the skilled men involved and regular communication at the working level is essential.

Furthermore, once technology has been acquired by an enterprise, effort is needed to keep that technology alive to ensure that it continues to contribute to the prosperity of that enterprise.

3. A Perspective on Technology Transfer from the Computer Industry

Today I see the role which patents also play in technology dissemination from the inside of the high technology computer industry. This is an industry in which technology advances so rapidly that often before we can establish our patent protection its value is eclipsed by new technological advances. This makes it harder to stay competitive and technological effort has to be concentrated into new developments and the rapid adjustment of manufacturing techniques. A great deal of technical information finds its way into the public domain in the wake of this progress.

Computers exist to improve efficiency in the processing of data, whether in commerce, industry or government. Efficiency usually means doing a better job with

fewer people and thereby releasing human resources for deployment into work which is less suited to automation and therefore more demanding intellectually. It may equally mean undertaking a larger task with a limited resource of skilled people, which is particularly important where a development is to be moved ahead faster and out of step with the educational development of the human resource. Even so, "Education and training are the most fundamental prerequisites for the successful application of computer technology for development."¹ Such education, and an understanding of the way in which computers can be used, is all a part of the overall spectrum of the technology transfer problem.

The use of the computer can in no way retard technological development. By itself it cannot really promote such development but, given a technological structure on which to work, it can certainly accelerate development at an ever-increasing pace.

Now what I have just said about computers applies with equal force to patents. A patent system does not in itself constitute the seed from which development will occur naturally. The patent system is more the fertilizer for natural growth once the infrastructure conducive to technological growth is bearing fruit.

It is important not to expect too much from a patent system but to respect its potential. In taking a posture towards the patent system from a developing country viewpoint, I believe it is best to keep one's options open, recognizing that the patent system may one day prove far more beneficial nationally but equally recognizing that an ineffective patent system could constitute an obstruction rather than an aid to technology flow. I will seek to explain this viewpoint now in more detail.

4. The Need for Protection

Success in any business depends upon its efficiency and is measured in terms of a contented work force, contented customers and a profit performance which, by attracting taxation, can keep the government content as

¹ Extract from p.12 of "The Application of Computer Technology for Development" (United Nations 1973, Second Report of the Secretary-General).

well. But we live in a competitive world and, in the race to progress, there must be a measure of protection for those engaged in businesses which are less successful. True progress is that which comes from new contributions and not that obtained by depriving others. Therefore businesses which are based on new technology are important. Such businesses are stimulated by competition but they must be protected against unfair competition. New technology would not arise without investment in research. Such investment is speculative and needs an internationally recognized form of protection.

The system of patents we have today is the method of protection which has developed from centuries of experience. The patent system was not, however, created by the business community. It is a device of government by which an inventor is encouraged to disclose something to which no one else has a claim because it is the inventor's own creation. All the inventor and his sponsors receive in return is recognition that, for a limited period commensurate with the time it takes for that knowledge to be disseminated and applied with their support, there is an exclusive right to gain taxable benefits from the fruits, if any, of the original creation. The products of research are intangible and unless this intangible work product is protected by a suitable intellectual and industrial property system there will be no incentive for further investment and the development of technology will be retarded.

Furthermore, investment in setting up a manufacturing facility for new and untried products needs to be protected, especially as the successful products have to sustain the losses on unsuccessful new ventures. Figure 1* therefore illustrates the seven essentials to success for a self-sustaining enterprise operating in a free market economy. In the absence of protection, competitors gaining free access to technology are able to compete without carrying the burdens of the investment in research. As a result, unless there is protection, there is less prospect of speculative investment in the setting up of manufacturing facilities.

In considering technology which is relevant to patents, I am concentrating on a very limited section of

* Figures illustrating this lecture appear at the end of the text.

the technology available. First of all, those of us engaged in patent work well know that there is a vast amount of published technology of record on a worldwide basis and all of it is accessible to all countries of the world. This is the body of knowledge which in the patent profession we have to search to determine whether an invention is really new. Published technology in this sense also includes all patented technology because patent specifications are published and universally available. The fact that there may be patents in a developed country with no counterparts in a less developed country is irrelevant to the sharing of this body of knowledge since the developing world already has access to it without any concern for patents. This is illustrated in Figure 2, which shows a schematic comparison of the spectrum of technology as between a group of developed countries (DC) and less developed countries (LDC).

On the other hand, there is, of course, a limited amount of technology which is rather specialized and which is not published but guarded until eventually it is superseded or falls into the public domain. This type of non-published technology or secret know-how is not really essential to technological progress in the developing world. Its importance can be grossly overestimated when one remembers that published technology, in combination with the scope for training technicians to use that technology, is almost unlimited. Patents do provide the security which can be conducive to the licensing of such know-how but patents are not the means by which know-how is protected. The protection of know-how depends upon compliance with obligations of confidence as between those who share that know-how.

5. Contractual Obligations and Mutual Trust

In Figure 3, the operating structure of an enterprise relying on a technology supplier is shown. In contrast, Figure 4 shows the structure of an enterprise which creates its own technology by expenditure on research. As explained above, such an enterprise needs to protect the technology created so as to remain competitive while securing a return on the investment in research. Such protection is particularly important if the enterprise wishes to become a supplier of technology as illustrated in Figure 5. There have to be confidentiality obligations as between the employer and his work force and, additionally, contractual undertakings relating to inventions

particularly applicable to the workers engaged on research and development. However, contractual obligations are not sufficient.

Technology is created by a technological work force. The contract between the employer and the employee depends upon trust. The employee contributes his skill in creating technology, which is then utilized within the employer's business. The engineer working in research and development is paid a salary. His salary seldom depends upon there being agreement that specific inventions will result. Industry could not function if contracts of this nature governed the flow of technology from its creator (the individual) to the world of industry in general. Also, it is essential, in a competitive world, to oblige other employees having access to the newly created technology to keep it confidential, at least until it is patented. Then, given the right attitudes, which combine resource with skill and depend upon mutual trust, the employer and his employee achieve success which is mutually beneficial.

This highlights to some extent the problem we face when we talk of technology transfer to developing countries. It is very difficult to specify in advance in a contract something that is intangible by its very nature. In practice, as with the employer/employee relationship, one can only judge on the basis of the results achieved.

There are really four elements in the transfer of proprietary technology, whether between employee and employer or between two business enterprises. The parties must come together in a spirit of mutual trust. Then there is the know-how itself, which may come in a package on a one-off basis or be supplied on a continuing basis. There is the additional back-up protection afforded by any patents that may exist and there is the follow-through action which is so important to cater for the situation where things go wrong.

You can judge a supplier (and indeed an employee or employer) not so much from the legally binding agreement which governs such a transaction but from the service he provides to ensure satisfaction after the "sale." Furthermore, this is not a one-sided transaction, and the receiver of the technology must play his part as well so that the next deal can start on a good foundation.

When a supplier of technology and a receiver of technology come together and make an agreement, they both have an eye to their own mutual business interests (see Figure 6). The technology which flows, if it has any real value,

needs to be safeguarded so that it does not flow freely to others (see Figure 7). However secure the arrangements, there is an inevitable risk of leakage of information, which increases in proportion to the number of people sharing that information. Accordingly, those interested in protection must look beyond the terms of a technology transfer agreement between two parties and seek back-up protection which can be of some value if, for reasons outside the control of both parties, some leakage occurs. The patent system provides such protection (see Figure 8). It confers rights enforceable against third parties. It provides the extra stimulus for encouraging the transfer of know-how and having unrestrained co-operation in a joint venture through which the fruits of technology can be exploited by using the combined resources of several enterprises.

The patent is not the vehicle by which technology is transferred. It is the means by which the unlicensed transfer of technology can be made ineffective, at least for the limited life of the patent. The technology transfer agreement is the legal means by which an arrangement to transfer technology is established. But the agreement itself cannot usually describe and specify in detail the technology. The technology transfer which is a consequence of the agreement takes place by communication between those who use the technology. The protection afforded by the patent system is often an inducement to the supply of technology exceeding that contemplated in the technology transfer agreement, especially when the payment is in the form of royalties arising from a patent licence included as part of the technology transfer transaction.

It is of paramount importance to have a patent system which instils confidence in its users, particularly if patents are to be relied upon as a back-up for know-how licensing. Within a single multinational enterprise know-how licensing is very simple but, when it comes to arranging for know-how to be transferred between two separate bodies, one in one country and one in another, patents in both countries can prove to be very useful in giving additional security to the transaction and in making it possible to enter a contract which lacks complication and is therefore more likely to be enforceable. The patent can provide a fall-back position if something goes wrong and the know-how escapes into the public domain. In this sense the patent constitutes the backbone of an agreement which may otherwise be very difficult to formulate.

As an aside, I would also say that businessmen often have more faith in the patent system than the legal or technical specialists engaged in patent work. To the businessman a patent is synonymous with valid protection, whereas to the specialist there is always a case for disputing the validity of a patent on technical grounds, and there are no guarantees. On balance, it is the trust which businessmen place in the system which makes it work. It is the respect which successful business has for the law which creates a situation where a patent position has value. Because the lack of patent protection implies insecurity, proprietary technology is less likely to flow across country borders into areas where there is no effective patent system.

In forming specialist opinions about the patent system, much must depend upon whether one approaches the subject with the eyes of a lawyer or those of an engineer. The horizons of the lawyer are often those set by his national laws, which, in turn, are determined by national politics. The horizons of the engineer know no national boundaries. The independent engineer sees the world at large from the viewpoint of its potential to absorb what he can contribute. He needs opportunity and incentive and he puts his faith in what the patent system has to offer.

The patent system in the hands of industrialists, engineers and technical patent experts can help in technology transfer. If the system is to be judged only on its face value in a purely legal context which over-emphasizes the importance of the monopoly right conferred, then it loses its value and there will, in consequence, be less likelihood of proprietary technology being transferred. This applies whether we are speaking of a developing economy or a developed economy. There are many forces at work eroding the patent system today and such erosion, wherever it occurs, has an international effect in making the owners of technology wonder if it is better to exploit their technology themselves and opt for short-term protection by keeping it secret.

6. International Filing Strategy

Within the multinational enterprise patents also have an indirect role to play in affecting the flow of technology. Patents can be important in controlling the growth of the body. Business decisions, including investment, the opening of new markets, the establishment of plants, the training of personnel, etc., are usually contemplated without reference to a patent position. Such decisions have to

look right when viewed from a commercial and political point of view and very often patents come into consideration only in the final approval cycle before a commitment is made. There are always pros and cons affecting such decisions. The existence of patents which can protect an investment can therefore influence such decisions and swing the balance in favour of investment. If the resource is available for expansion, there may be a choice between expanding in a new geographical area (possibly a developing country) or expanding into a new technological field in established areas. These are the issues and, if the Patent Manager declares that he has established a good patent position for the new technology on the home market but has not established a broad patent position for the more established technology in the developing country, then the business decision may, at least in certain industries, be affected accordingly.

Speaking of the strategy of a multinational enterprise in anticipating patent requirements and deciding which inventions to protect in which countries, the essential point here is that the Patent Manager cannot imagine the business decisions which are going to be taken 5 or 10 years ahead. This is illustrated in Figure 9. Patents have to be applied for very quickly after the invention is made. Accordingly, the Patent Manager has to spend his patent resource guessing how a country might develop and how his employer's business might develop, guessing at the patent requirements for each country long before the relevant business decisions are taken. For this reason many patent applications are filed on a speculative basis. It is an expensive exercise to file patents in many countries, and particularly in countries which have yet to develop and are therefore not sustaining the business which would justify the expenditure on patent filing fees.

Decisions to file patents in the various countries of the world are often made on an anticipatory basis, where money is spent in the hope that the patents in a particular country will prove of some value having relevance to that particular country. There may be no ulterior motive or strategic management decision determining patent expenditure in many countries. It is often mere speculation and the money will be wasted if the patentee's business interests in the country concerned do not eventually develop with the progress of that country. It is not a question of wishing to file numerous patents to exploit markets in the developing world. Even if there is the financial resource, there is often no reason why patents should be filed. There is unfortunately very little incentive. The

harm done is simply that at some time in the future, if an enterprise has been deterred from filing patents on a speculative basis, then this could well divert investment and technology elsewhere, where the patent climate has previously been more favourable.

It is noteworthy that at the present time, both in the United States and Canada, no annuity fees are payable for maintaining a patent for its full term once granted. Furthermore, the life of a patent dates not from the application but from the date of grant. These have proved to be very strong incentives which have greatly enhanced patent awareness, particularly for US companies.

7. The Patent System and the Problem of Abuse

It may appear that the above arguments favouring the patent system take no account of possible abuse by foreign patentees. If there is concern about abuse, it should be kept in mind that the patents have no direct commercial value until the technology to which they relate is actually in use locally, either by importation or local manufacture.

There is little evidence of abuse in the sense that the patents are used; the talk about abuse seems to relate to the failure of the patentee to set up manufacturing facilities in the country concerned, which is in any event not part of a commitment which any patentee can accept in the early stages of determining a patent filing strategy. Commercial transactions involving patents are subject to tax laws and it is for any country so to regulate its approval of patent-dependent transactions that the national interest is catered for. Any aspect of such a transaction which is seen as an abuse is preferably not to be regarded as a feature to be obviated by patent law since, whereas preferential treatment on a nationality basis is usually a characteristic of tax law, it is not, according to the long-standing spirit of the Paris Convention, a proper feature of patent law. The patent world is a world of technology specialists interested in the advancement of the world's technological stock of knowledge. Inventors want to see their inventions used for the benefit of all mankind. Patentees who have speculated on the research which leads to the successful, as well as the unsuccessful, invention expect to see a return on their investment coming directly from the use of the new technology thereby created.

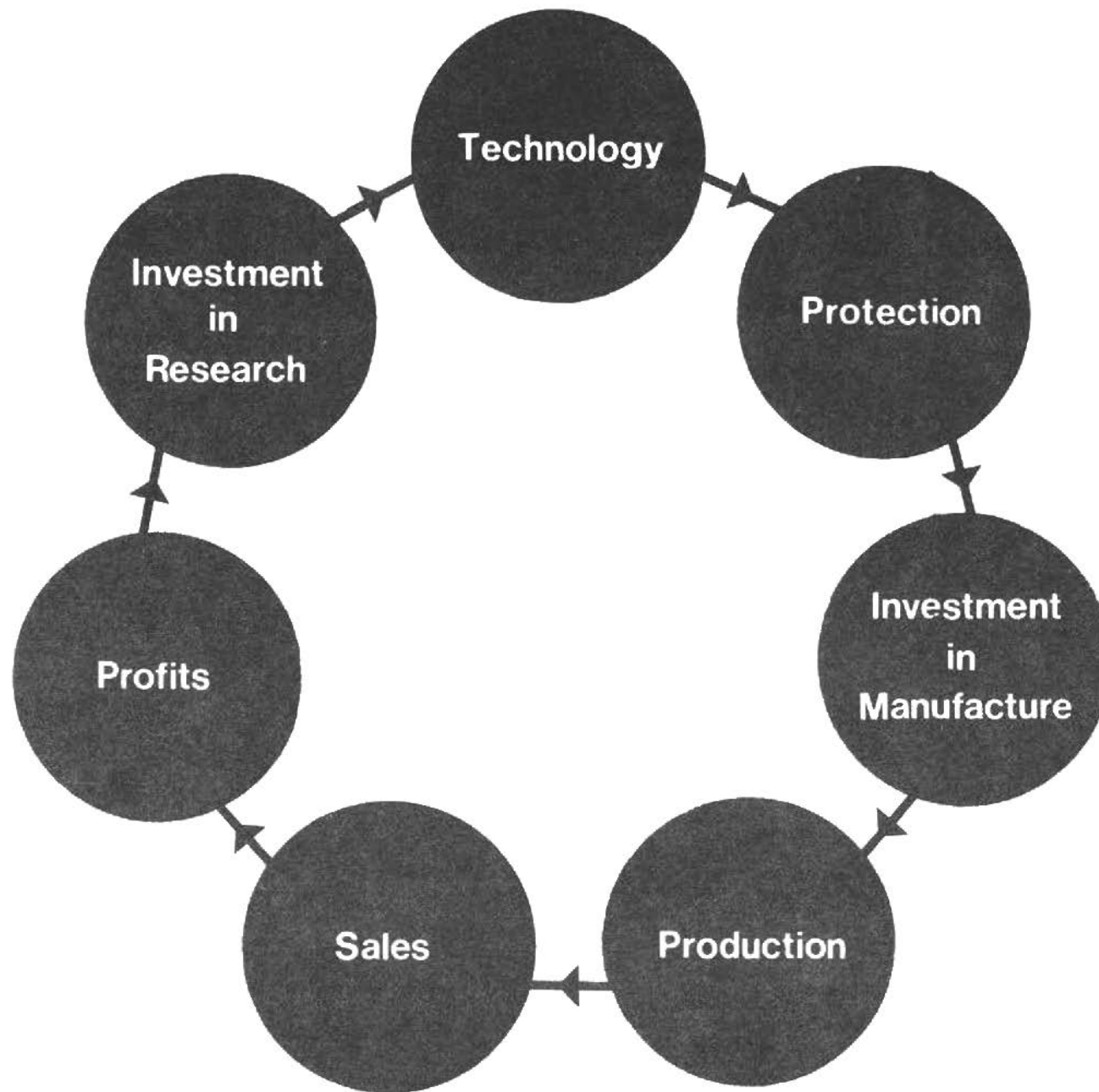
Unfortunately there are many influences eroding the value of patents and some of these are not compatible with the interests of less developed countries and the desire to encourage the inflow of the relevant technology. Figure 10 highlights the importance of the patent system internationally as the only effective form of protecting technology. In contrast, protection within the confines of a single company can be achieved by trade secret protection. Between these there are in some countries laws relating to unfair competition which can afford a measure of protection, but usually such protection is only of national scope. If we see the patent system being eroded (see Figure 11), then inevitably reliance on trade secret protection will increase while efforts are mounted to establish more effective competition laws at the national, regional and eventually international levels.

The developing world should surely develop a patent system which offers even greater incentives favouring the inflow of technology and, if what is feared is abuse in commercial exploitation, then such abuses should be addressed in fiscal laws.

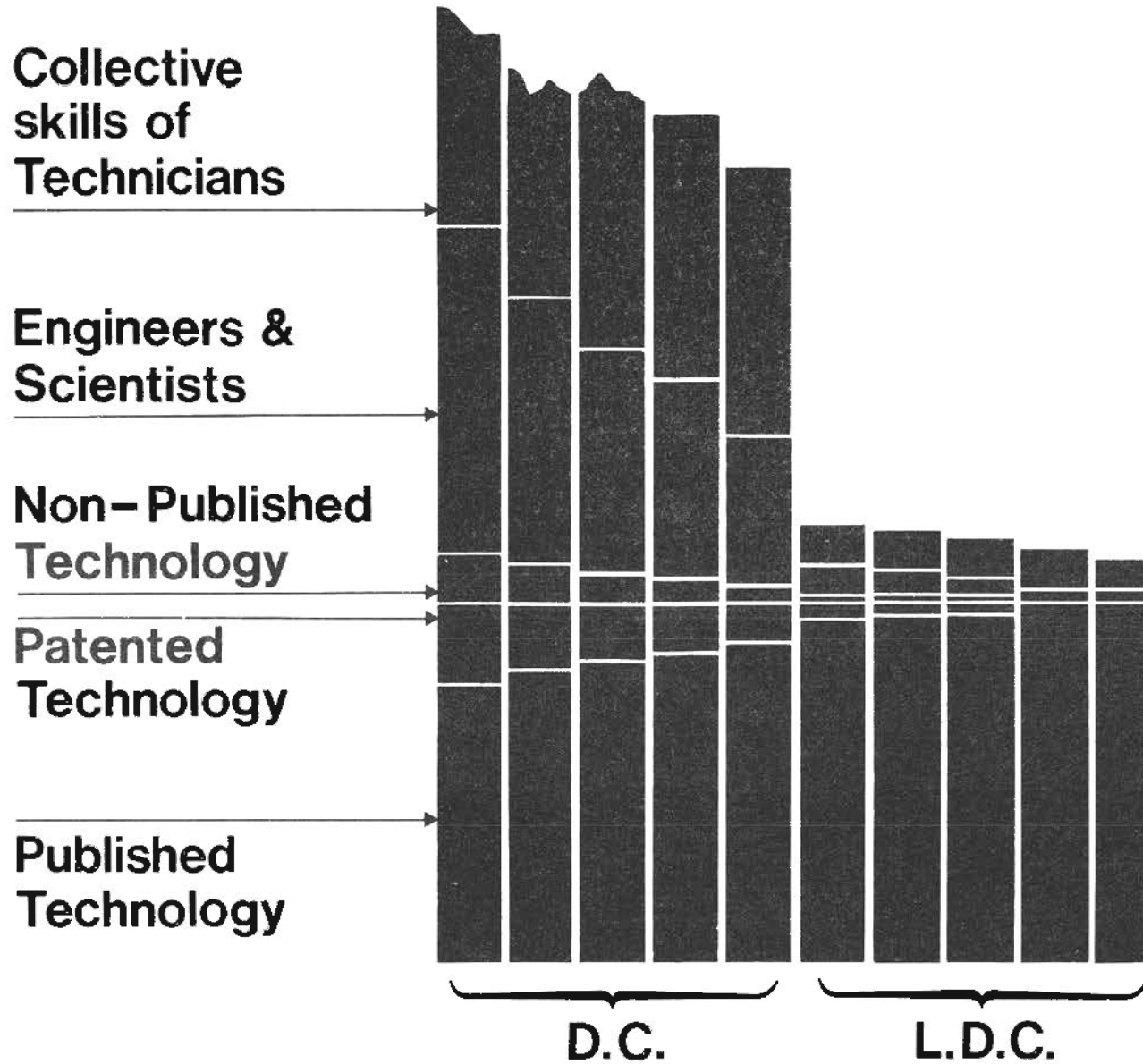
Reverting to Figure 1, the seven essentials shown are, in effect, the seven pillars of wisdom on which a successful enterprise can be founded. Trade in technology depends upon these pillars (see Figure 12), but if the patent system is eroded away then the world will undoubtedly be confronted with a breakdown in the processes of technology transfer (see Figure 13).

[Figures follow]

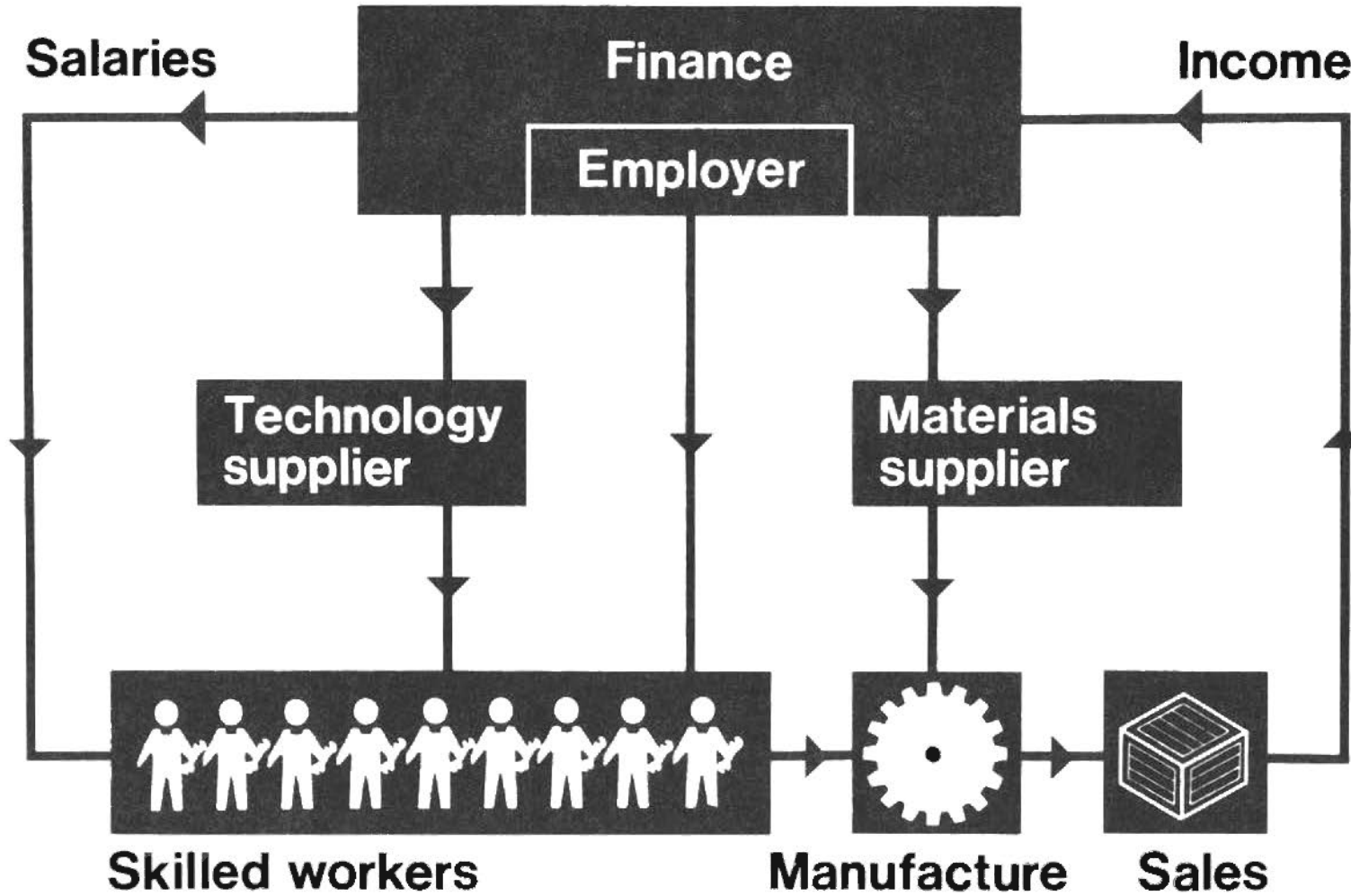
FIG. 1



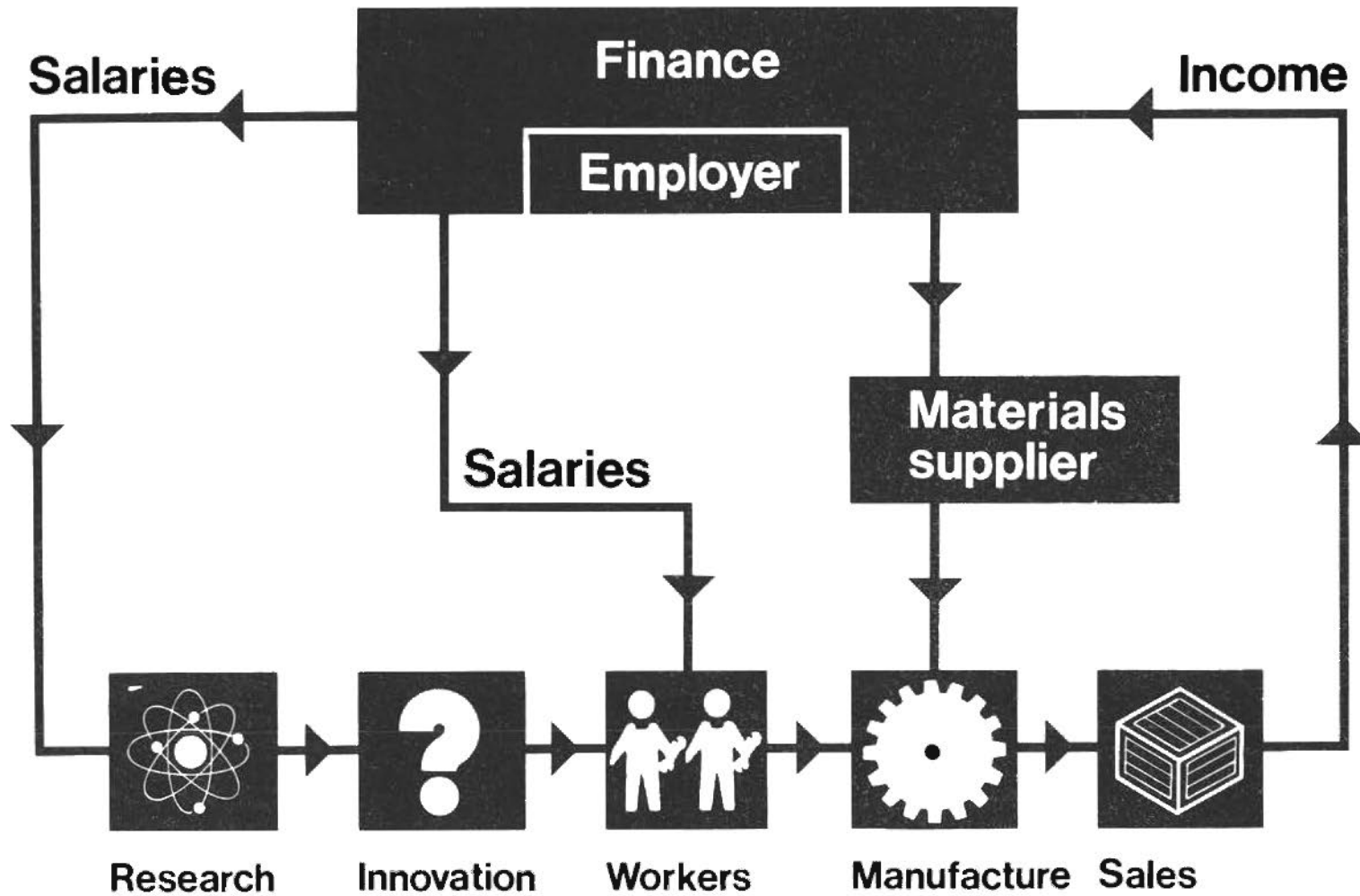
The Distribution of Technology



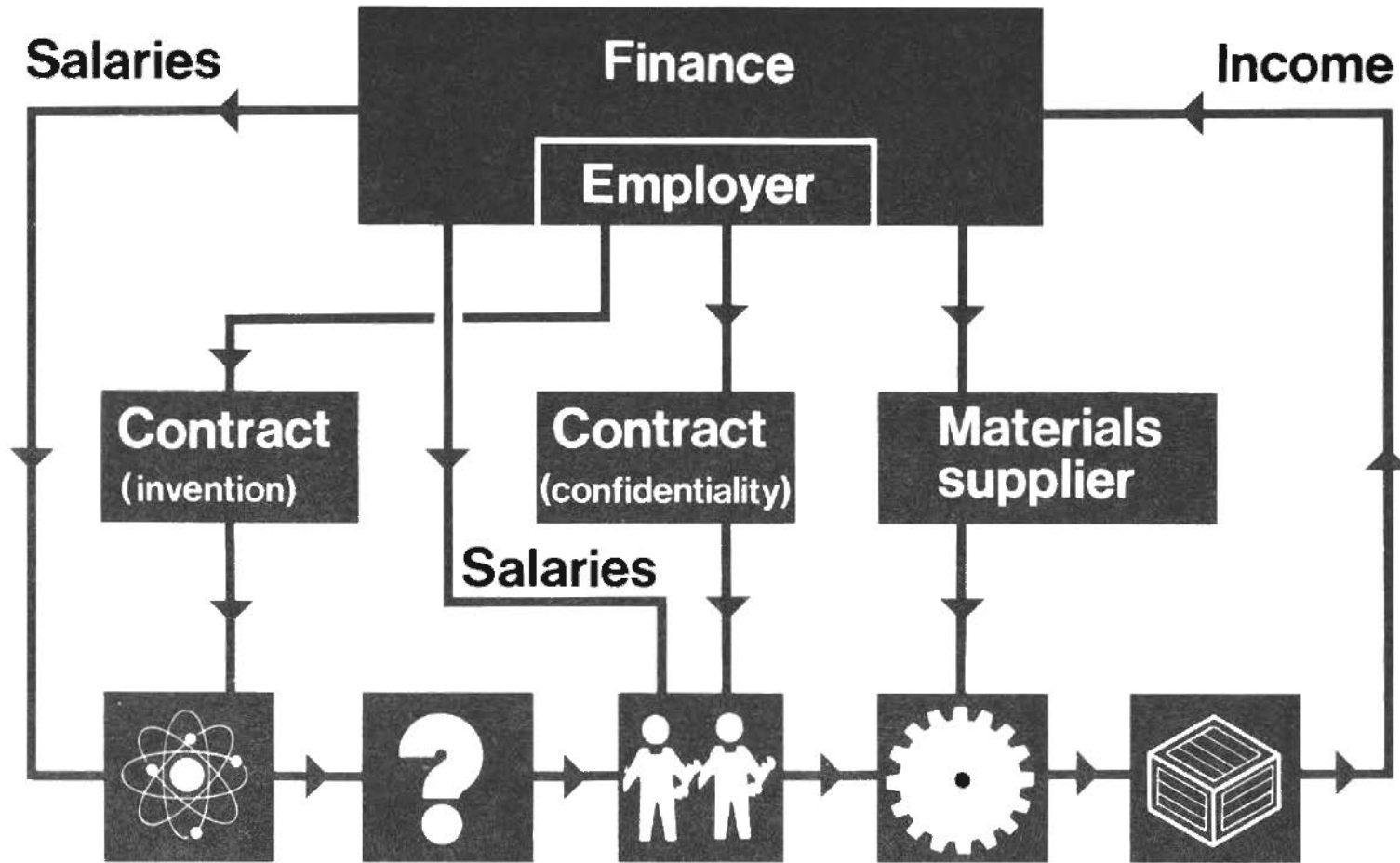
The Recipient of Technology



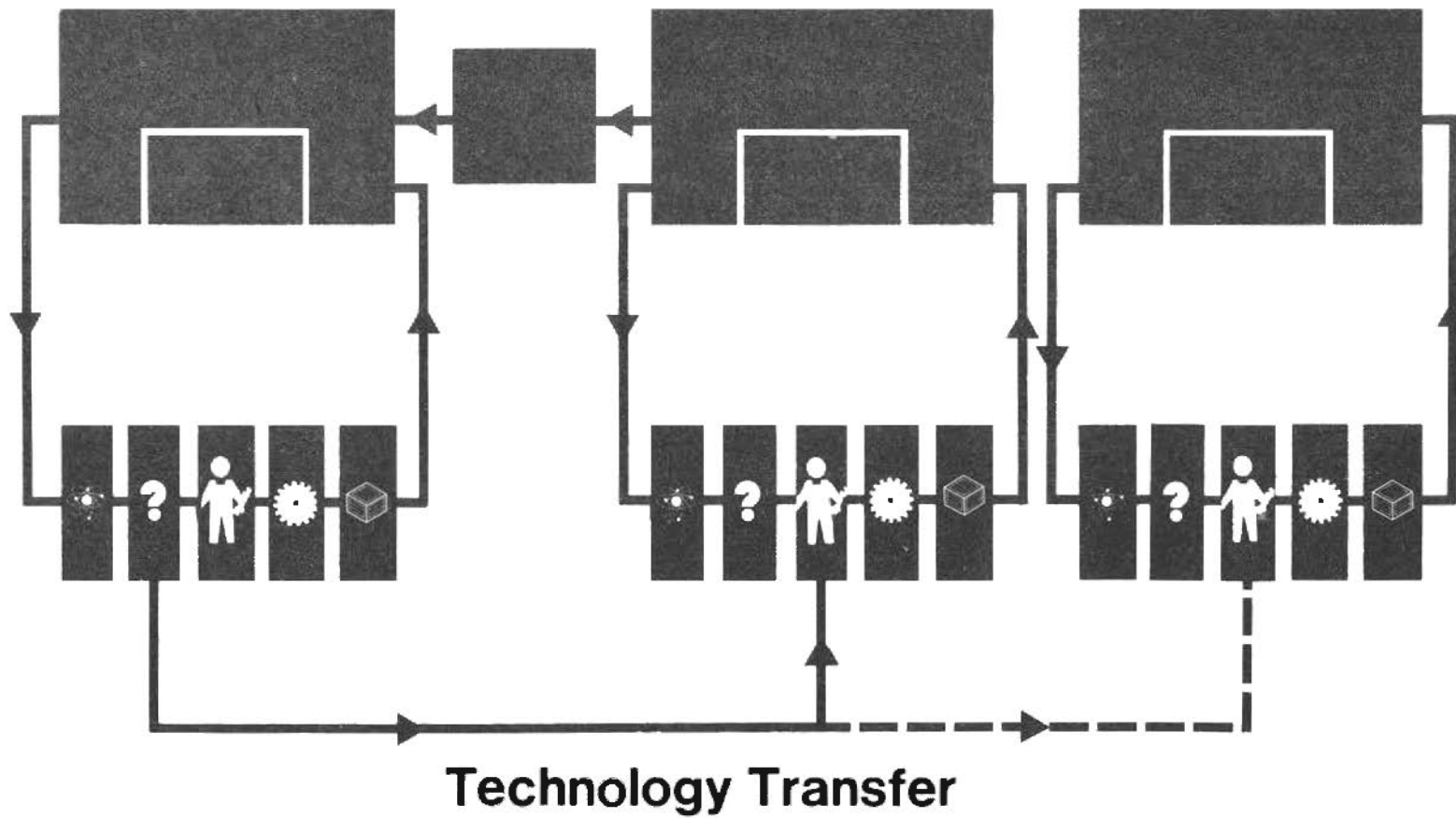
The Creator of Technology



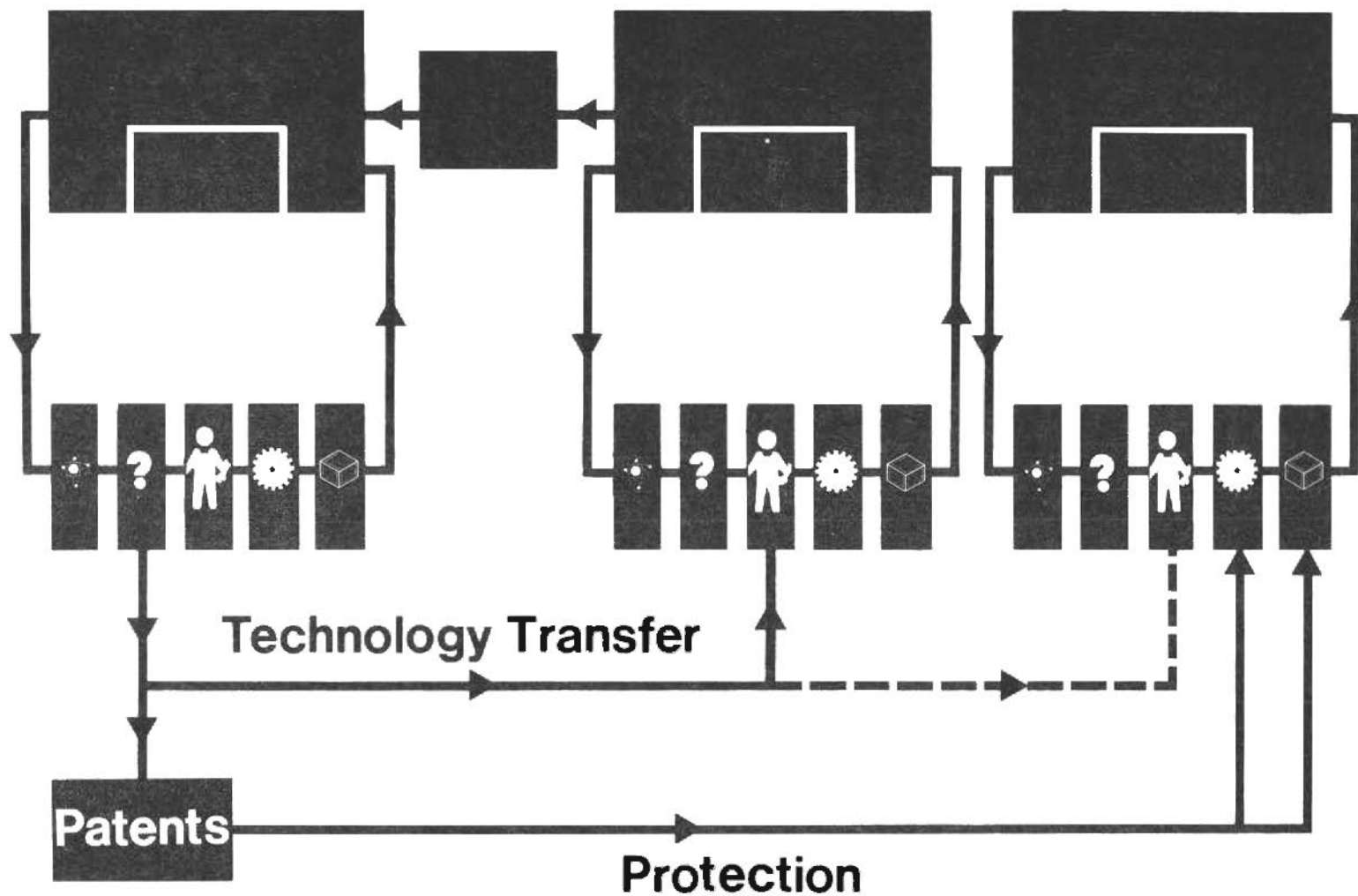
The Supplier of Technology



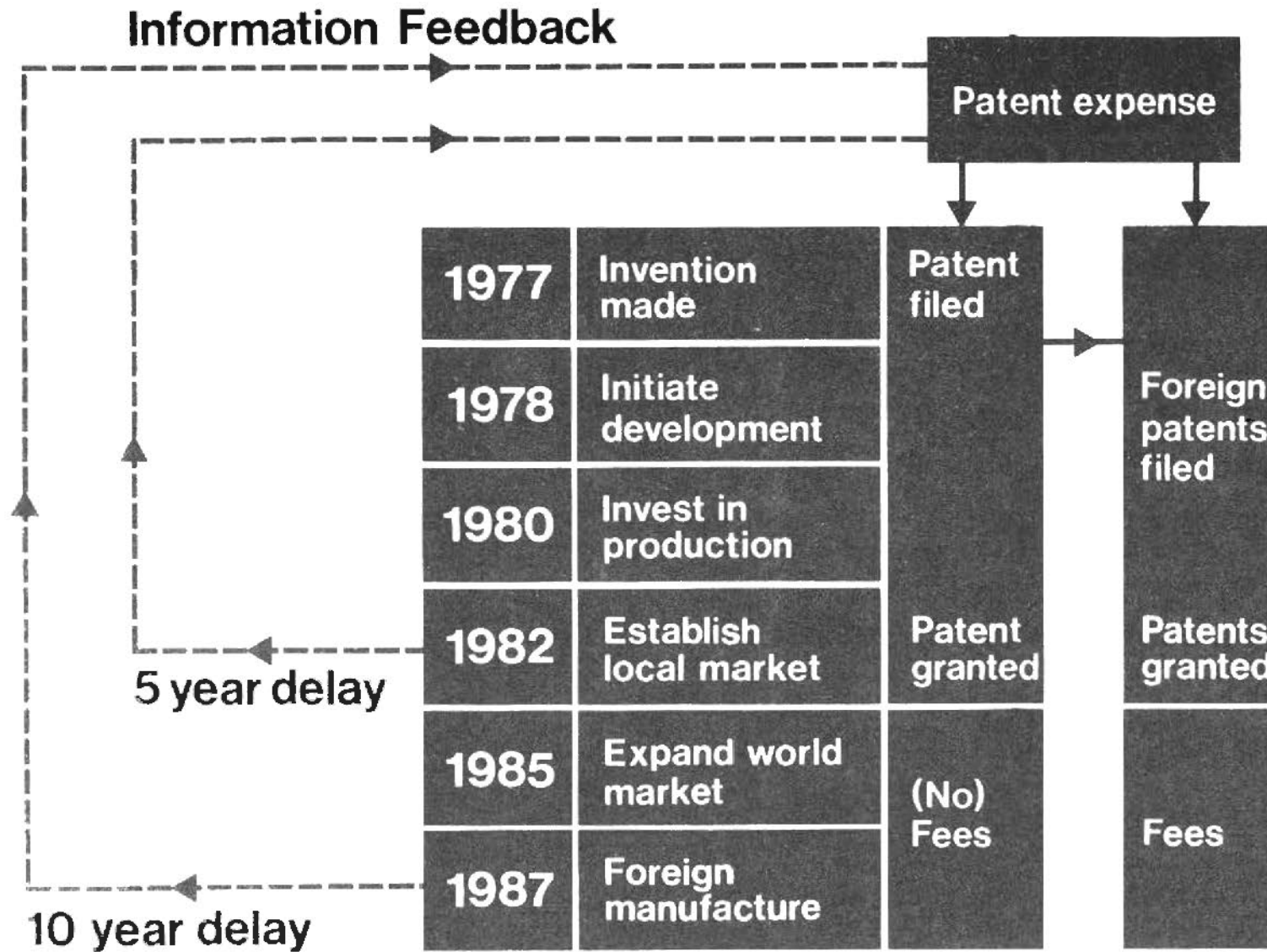
The Process of Technology Transfer (2)



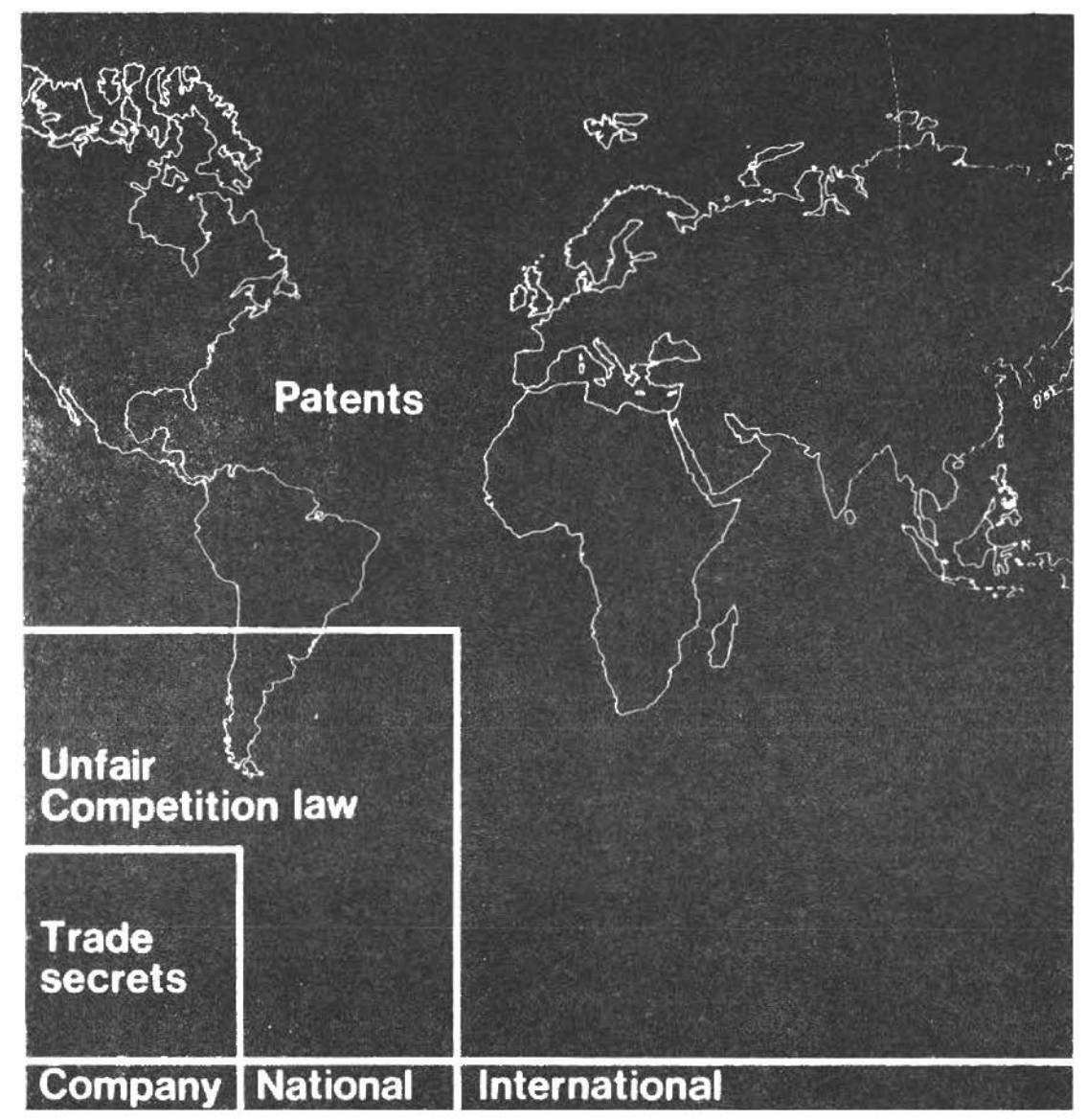
The Process of Technology Transfer (3)



Patent Strategy – Time Scale



Technology Protection



Patent Erosion

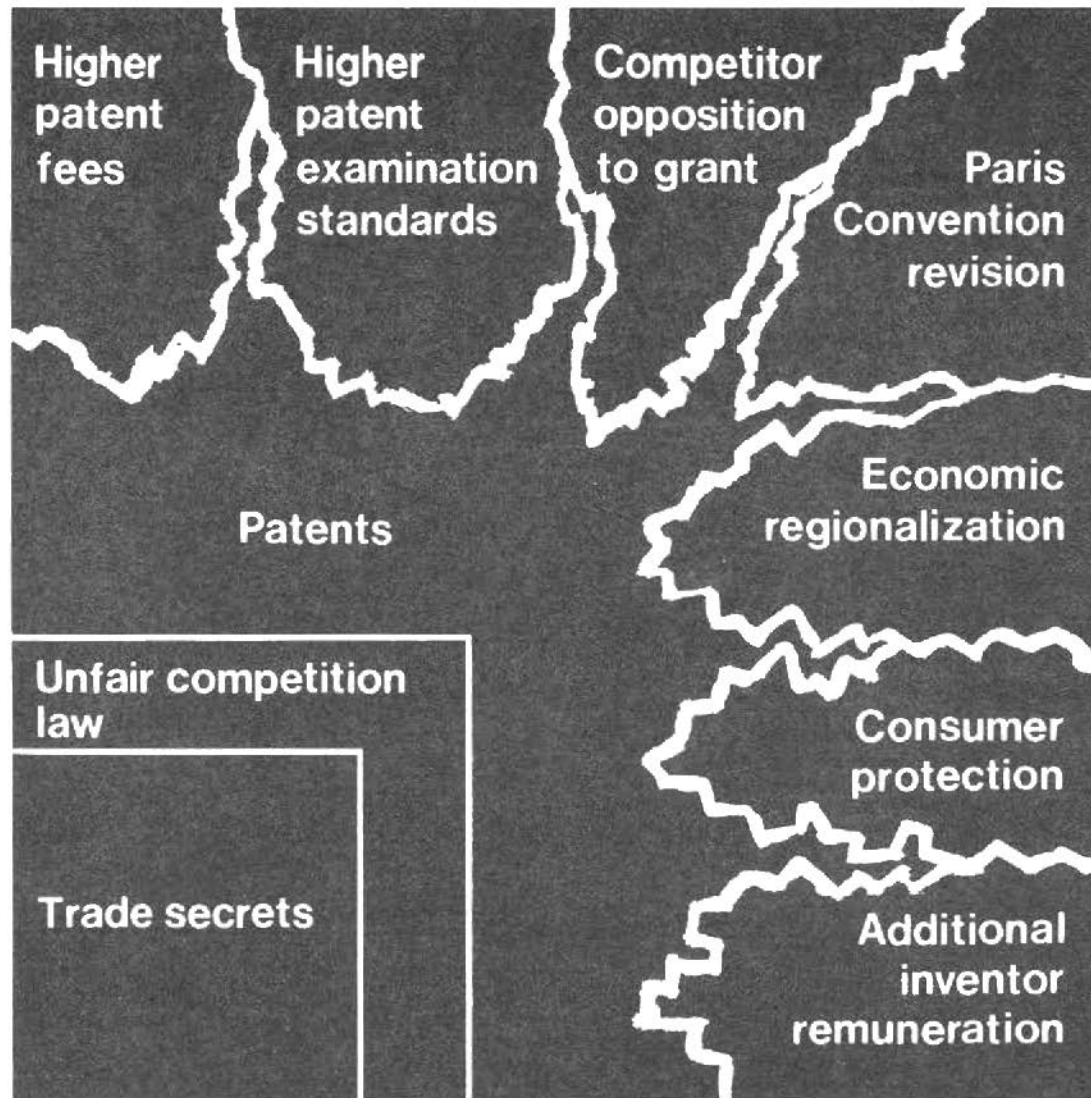


FIG. 12

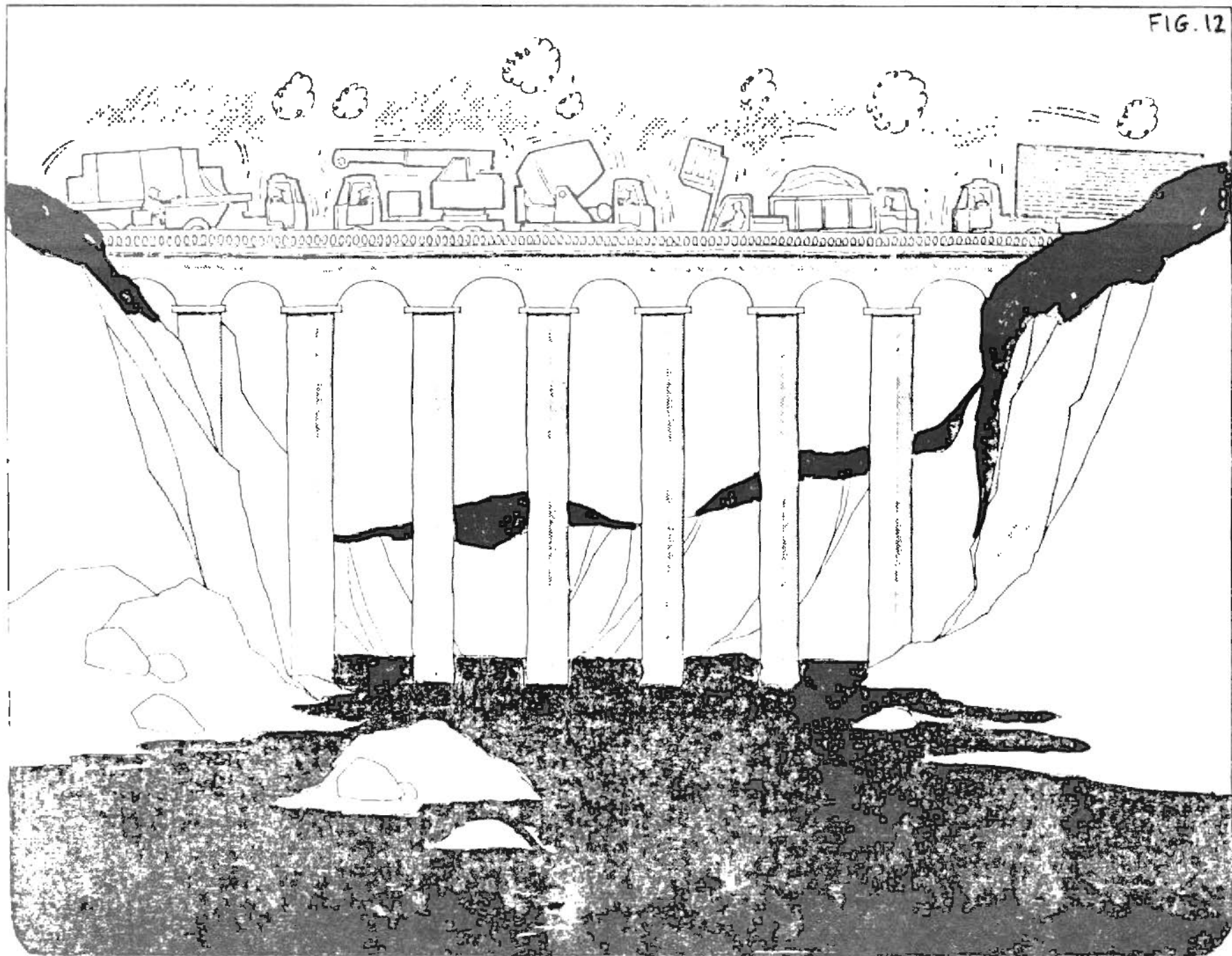
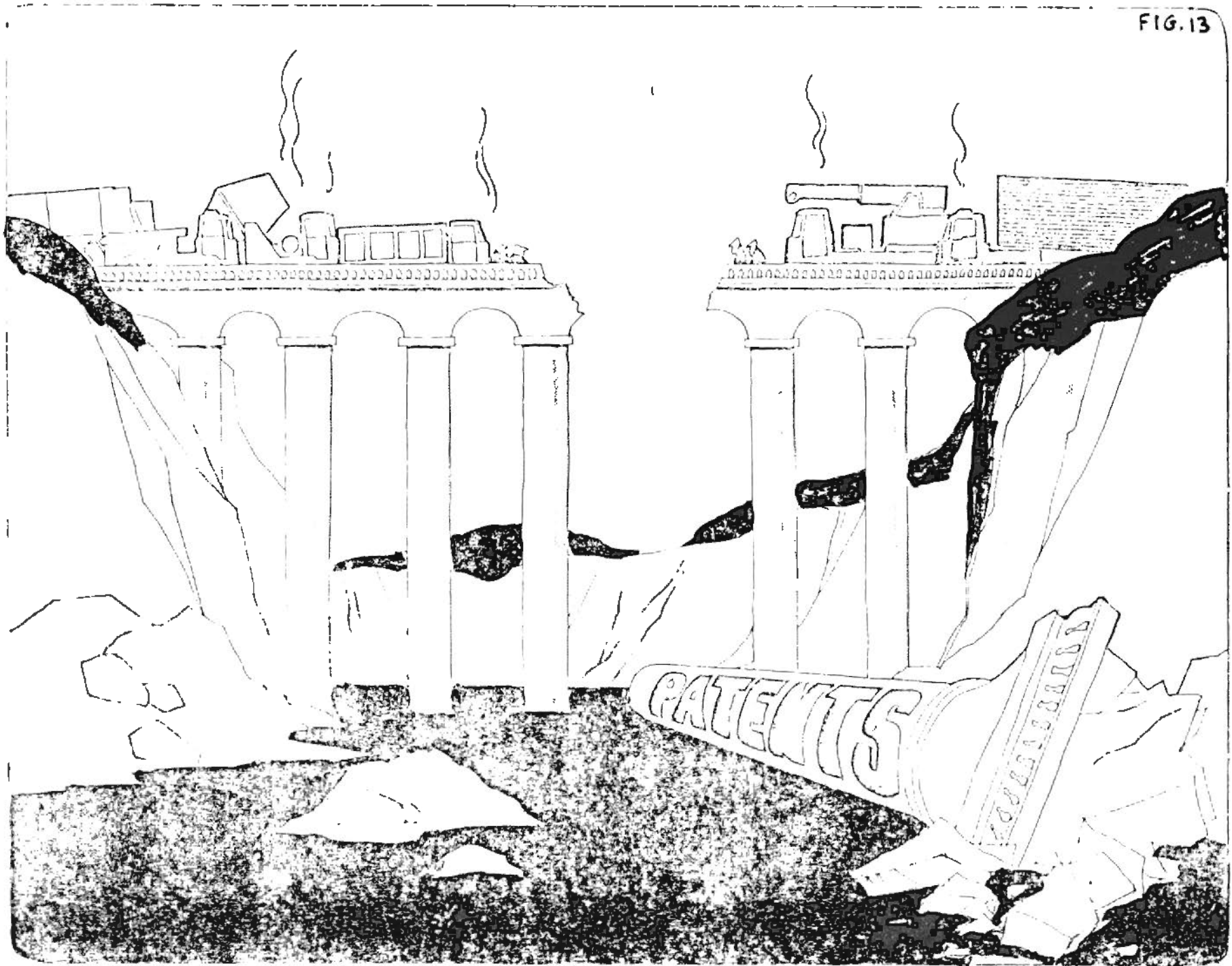


FIG. 13



SELF-RELIANCE IN TECHNOLOGY AND THE PATENT SYSTEM

Arcot Ramachandran

Secretary to the Government
Department of Science and Technology
India

1. Technology Base in Industrialization

The Indian economy before independence was characterized by a large agricultural sector and was relatively isolated from the industrial revolution that had taken place in the West. The Indian agricultural sector at that point of time employed well over 75% of the population and had relatively low levels of production, even for agriculture. Compared with international standards there was also inadequate availability of energy, transportation facilities, methods of extracting the natural endowments of the country and inadequate supply of technologies and technological institutions. As a result of 25 years of planned development in India, in terms of industrial output, India could perhaps now be ranked among the top twelve countries of the world. This industrial growth over the last quarter of a century is thus significantly more impressive than the entire development over the preceding centuries. The general index of industrial production is of the order of 300% if 1950 is taken as the base. However, it should be noted that more remarkable growth has taken place actually in relatively newer and more complex industries such as petroleum products, aluminium manufacture, metal products, electrical and non-electrical machinery.

In the area of iron and steel, there are six integrated steel plants in the country producing over 6 million tonnes of steel annually, which has contributed to achieving near self-sufficiency in making a number of engineering goods. The dyestuffs industry, which did not exist some 25 years ago, has advanced to such an extent that practically no imports in this field are now taking place. In the drug industry, whereas

most of the drugs were imported and only formulations were being done, now most of the drugs are manufactured indigenously and the drug industry has attained the status of a major industry. The textile industry is now no longer confined to cotton and jute textiles and there are quite a few units producing different types of synthetic fibres. The engineering industry, which was practically non-existent, has now become self-sufficient in a variety of engineering equipment and is capable of designing, developing and manufacturing a varied range of machines and equipment for a variety of processing plants and engineering units. The country is currently producing steel, chemical and fertilizer plants, electrical and construction machinery, machine tools, transportation and agricultural equipment and a very large number of other items. The machine-building industry has also made rapid strides and can satisfy virtually the entire need for power-generating equipment. Self-sufficiency has also been reached with regard to sugar and cement machinery. India produces over 4.7 million tonnes of sugar and 18 million tonnes of cement annually.

The principal instruments in achieving the objective of rapid industrialization in India included, in particular, the Industrial Licensing Policy, the Export and Import Policy, the Policy on Foreign Investment and Reservation of Industries for the Small-Scale Sector and the Policy for Scientific Research and Development.

The industrial policy broadly defines the sector in which private industrial investment can take place and outlines the concept of public ownership as a means of production and distribution in selected industrial and service sectors. The import policy was one of the important means of accelerating import substitution in different branches of the Indian economy. The rationale for the tariff policy was to protect the infant industries till they became strong enough to face competition from external markets. Export generation and import substitution are two sides of the same coin and, thus, the export policy also kept pace with the import policy.

The Government policy towards foreign investment is highly selective and aims at filling technological gaps and expanding exports. Equity holdings ranging from 40% to 74% are possible generally in the case of activities in the selected areas of industrial activity, industries involving highly sophisticated technology and industries involving substantial exports. Depending upon the extent of these three categories of activities within a company, industries may, in special cases, also have a holding of 51% or more of foreign equity.

Equity holdings below 40% are allowed in certain industries but new investments are generally made on a very selective basis.

A large number of industries were reserved under the small-scale industrial sector in the knowledge that these would be an effective instrument for attaining the objectives of additional productive employment in rural areas and increased production of items of mass consumption. Production from the small-scale sector today accounts for nearly 40% of the total industrial production.

Science and technology development in India has received the attention of the Government right from the early days of independence and in fact the Government's science policy dates back to 1958. One of its objectives is to secure for the people of the country the benefits of the acquisition of scientific knowledge and its application. There now exist six major organizations: Atomic Energy Commission, Defence Research and Development Organisation, Space Commission, Council of Scientific and Industrial Research, Council of Medical Research and Council of Agricultural Research. These major agencies account for over 80% of the total expenditure on research and development, with a manpower of over 100,000 engaged in research and development activities. Almost all over the world, science and technology have been used as instruments for the attainment of national goals. In one way or another, science and technology are linked to the solution of the most pressing problems of national development and particularly industrialization. The basic objective of the Science and Technology Plan is to support the drive for self-reliance in the core sectors of the economy, such as agriculture, energy, mining, metallurgy, heavy industries and chemicals, and make further progress in such areas as atomic energy, space, electronics, thus contributing to the basic needs of the people.

In the context of India, several sources of technology required for industrialization can be identified, the chief among them being imported technology, technology developed in the R&D Institutions in the country, technology developed in industry and the know-how developed by individuals. Practically the whole of the industry in the large-scale sector used imported technology to start with. This was so in the case of steel, fertilizers, cement, drugs and pharmaceuticals, plastics, synthetic fibres, heavy engineering equipment, etc. Even in the medium-scale sector a large part of industry was based on imported technology. Practically the entire industry manufacturing drugs and pharmaceuticals, paints, varnishes and other inorganic chemicals, dyes, machine tools and electronic items had large doses of imported technology. Even

raw materials had been imported in a number of cases. This is significant in the case of special materials required for the manufacture of specialized equipment for chemical and other industries. Attainment of economic independence and self-reliance has now become the guiding principle of the industrialization programme. This has two facets: firstly, the ability to supply the wherewithal for future economic growth indigenously and, secondly, a vigorous export effort to step up the foreign exchange resources of the country in order to augment capability of financing essential imports. Science and technology represent an important instrument in breaking the technological backwardness of the production base of the Indian economy by making it self-reliant.

Science and technology have no territorial barriers and as such the advances that have taken place in different parts of the world have found their application in several industrial sectors in India. However, this flow of technology has not been without some controls and restrictions. Basic appreciation of the transfer of knowledge for the benefit of human beings has influenced the entire process of transmission of knowledge between different parts of the world. Experience has also shown that certain new innovations have been entirely responsible for saving the lives of human beings, reducing their drudgery, making their lives more purposeful. However, economic considerations in developing this technology have demanded adequate compensation from those who use this technology on the basis of the recovery of development costs. In order to encourage such acts of innovative effort, certain systems have been evolved over the ages and one such has been the patent system. Other forms of encouraging scientific research and technology development would include utility models, inventors' certificates and other national and international awards.

In the industrialization of developing countries, the use of several patents is frequently involved in the imported technologies. Often they form part of the package in a turn-key project or a technical collaboration arrangement. In yet other cases, the foreign inventors take care of the patent liabilities. Since technical collaboration agreements have been a major source of technology transfer to India during the last 15 years, some issues related to the building up of self-reliance through such imported technology are outlined in the next section.

2. Self-Reliance Through Imported Technologies

In view of the fact that the balance of costs and benefits is not favourable in all cases of direct foreign capital investment, yet another--alternative--form of import of technology has become well established in the form of technical collaboration arrangements. These relate to the sale of technology and know-how by foreign firms against specific royalties and technical fees. A minor share by the foreign collaborator could be treated as a particular case of such technical collaboration arrangements. The effective technology transfer by companies without foreign investment has been and is engaging the attention of several international agencies. Although the knowledge transferred under such technical collaboration arrangements, when viewed strictly from the point of view of the immediate utilization of a given technology, has been satisfactory, from the point of view of ensuring self-reliance in that technology, it has not always been so satisfactory. This has necessitated repeated imports of the same technology or repeated extensions of the same technical collaboration arrangements over very very long periods.

When processing approvals for technical collaboration arrangements, consideration, therefore, needs to be given to building up self-reliance in the imported technology.

The knowledge and technology transferred under a collaboration arrangement would depend very much upon the motives of the parties involved in the technology transfer arrangements. The knowledge transferred under such arrangements could then be considered as an index to ascertain the self-reliance that had been reached following the import of a technology. The extent of knowledge that may be transferred could depend, in addition to the relative bargaining strength of the transferor and the transferee, upon the nature of the technology transmitted and the assimilating capacity of the transferee firm. The calculation of costs and benefits in such a transfer of knowledge and, in turn, the cost of building up self-reliance in a technology involve complex indirect factors such as the following:

(i) Perhaps the foreign collaborator may have to take into account the possible erosion of its monopoly of technology.

(ii) Transmission of technical knowledge abroad may lead to competition of the transferee firm in its markets.

(iii) The return from the technical collaboration arrangement would be only for as long as the agreement is in force. The

royalty payments and technical fees may not fully satisfy the foreign firm for the knowledge to be transferred.

The extent of knowledge transmitted under technical collaboration agreements could be restrictive for a variety of reasons. A firm cannot transmit knowledge abroad in the absence of complete technical and marketing information. This is especially true when the advantages it possesses arise because of production differentiation. If foreign firms regard technical collaboration agreements as a second best choice to direct investment, such firms would transfer very limited knowledge under a technical collaboration arrangement.

Apart from the foreign firms' willingness to transfer knowledge, the transferee firms' ability to absorb and utilize it is also an important facet of the extent of knowledge transmitted. The ability to adjust the technology to suit the smaller scales of local production and the production itself to local market needs may be crucial. The success of the transplant under technical collaboration agreements is predicted by the availability of both capital and an elastic supply of material and components. The suitability of a particular type of transfer mechanism may depend on the stage of development of the host country. Technical collaboration agreements may be viable mechanisms in economies that have developed indigenous sources of supply and a core of technical personnel who can convert, restructure and adapt the imported knowledge.

Even in circumstances where transfer of knowledge is not really sought and therefore self-reliance in the technology is unlikely to be built up, certain technical collaboration arrangements can continue to be useful. In such cases, the objective of import is not centred on self-reliance but could be centred on other programmes. Thus, if a technology can be imported in a form that will produce a product identical or equivalent to one that is being currently imported and whose imports cannot be reduced in the immediate future, there may be justification for importing technology in lieu of the product itself. Again, in order to fulfil a specific export obligation requiring given production specification, it may perhaps be worth while to import a technology specifically to meet the requirements of the anticipated export. In other cases, consideration should be given to the technology package which would promote the building of self-reliance. This would then make it possible to restrict the outflow of foreign exchange on a continuing basis by not requiring the collaboration to go on beyond the initially stipulated period and also to adapt it to the changing requirements of the market

either internally or for export. It is in this context that an analysis is desirable to examine the technology package and its contents. As indicated earlier, use or non-use of patents constitutes an element of this package.

In India, technical collaboration arrangements have to be approved by the Foreign Investment Board which was established towards the end of 1968. Guidelines relating to such foreign collaboration have been published and these indicate that the categories of collaboration in industry fall into three distinct sections. List I contains those industries where foreign technical collaboration involving financial investment is permissible. List IA contains those where technical collaboration is permissible but without foreign investment. List II identifies cases where neither technical nor financial collaboration is normally permissible or, if collaboration is to be considered, it has to be on special grounds such as, for example, a substantially export-oriented scheme. Prior to 1969, some 3,000 collaborations had been approved and since 1969 about 300 to 350 collaborations are being approved every year. Thus Indian experience in foreign collaboration covers over 4,500 cases. During the last 5 years, the major collaborating countries have been the United States of America, West Germany and the United Kingdom (approximately 20% of the collaborations approved in India came from each of these three countries). Japan collaborated in about 10% of the cases and Switzerland in about 8%. The largest number of these collaborations have been in the field of electrical equipment (20%) and industrial machinery (20%). Chemicals and transportation both account for about 10% each, machine tools 7% and metallurgical industries 6%. While many of the collaborations entered into before 1969 have now expired, in a few cases extensions have been found necessary and have been approved. Technical collaboration arrangements appear to constitute a major source of international technology transfer to India.

Based upon the experience gained thus far, the foreign collaboration approvals granted currently carry certain standard conditions. The following 10 conditions are generally imposed on all new collaboration agreements:

- (i) The Indian company should be free to sub-license the technical know-how/product design/engineering design under the agreement to another Indian party, should it become necessary. The terms of such sub-licensing will, however, be as mutually agreed by all the parties concerned, including the foreign collaborators, and will be subject to the approval of the Government.

- (ii) The deputation of technicians either way will be governed by specific approval to be granted by the Government on application, in terms of numbers, period of assistance and training, rate of allowances to be paid, travelling charges and other items of expense, etc.
- (iii) Import of capital equipment and raw materials will be allowed in accordance with the import policy prevailing at the time.
- (iv) Foreign brand names will not ordinarily be allowed for use on products for internal sales although there is no objection to their use on products to be exported.
- (v) Exports will be permitted to all countries except where the foreign collaborator has existing licensing arrangements for manufacture. In the latter case, the countries concerned will be specified.
- (vi) The duration of the agreement will be for a period of 5 years from the date of the agreement or 5 years from the date of commencement of production, provided production is not delayed beyond 3 years of signing the agreement (i.e., a maximum period of 8 years from the date of signing the agreement). Within this period, the Indian company should develop and set up its own design and research facilities so that continued dependence on foreign collaboration beyond this period will not be necessary.
- (vii) Where the item of manufacture is one which is patented in India, the payment of royalty/lump-sum payments by the Indian company to the foreign collaborator for a period of agreement mentioned in condition (vi) above will also constitute full compensation for use of the patent rights till the expiry of the life of the patent and the Indian company will be free to manufacture that item even after the expiry of the collaboration agreement without making any additional payments. A specific provision in this regard must be incorporated in the collaboration agreement to be entered into between the two parties.
- (viii) Where consultancy is required to execute the project, this should be obtained from an Indian engineering consultancy firm. If foreign consultancy is considered unavoidable, an Indian consultancy firm should nevertheless be the prime consultant.

- (ix) The Indian company should submit a return on the progress of the undertaking, showing the position as on the 31st of December of each year. This return should be submitted annually by the 31st of January of the following year till the date of expiry of the foreign agreement.
- (x) The agreement will be subject to Indian law.

It will be seen that condition (vii) referred to above relates to payments on patents. Generally speaking, payments for patents are considered a part of the overall collaboration arrangements. The clause referred to above is to permit the use of the patents even after the expiry of the agreements, irrespective of the life of the patent. Where only patent rights are required to be obtained, the approach is to make a lump-sum payment for such rights instead of a recurring royalty. It is with this industrial and technological base as a background that one proceeds to examine the process of structuring the different systems contributing to building up self-reliance in technology. Patents and the patent system make up one such factor.

3. Patents and Patent Systems

A patent could be described as an official document that confers ownership of an invention on the recipient--the patentee. It is granted by an official of the State in accordance with the patent law in force and is enforceable in the courts. While the grant and the examination preceding the grant of a patent are carried out by an office of the State, the final responsibility for validation and invalidation of a patent lies with the courts.

In India the Patents Act defines a patent as follows:

"'Patent' means a patent granted under this Act and includes for the purposes of Sections 44, 49, 50...and Chapters XVI, XVII and XVIII, a patent granted under the Indian Patents and Designs Act, 1911."

Thus, a simple definition for a patent is not easily found. This is so in many of the patent laws. In fact, the Paris Convention for the Protection of Industrial Property of 1883, as revised, lists the patent as one of the means for the protection of industrial property but does not define what a patent is or the subject matter that it encompasses. Bodenhausen in his Guide to the Application of the Paris

Convention for the Protection of Industrial Property describes a patent as an exclusive right to apply an industrial invention. The World Intellectual Property Organization, in Geneva, has drafted for the purpose of an UNCTAD study the following description of a patent:

"A patent is a legally enforceable right granted by virtue of a law to a person to exclude, for a limited time, others from certain acts in relation to a described new invention; the privilege is granted by a government authority as a matter of right to the person who is entitled to apply for it and who fulfils the prescribed conditions."

The UNCTAD study continues:

"The excluded acts are usually manufacturing, using and selling a patented product, and using a patented process. Certain acts related to selling, such as importing and stocking, may also be explicitly or implicitly excluded.

"The person entitled to apply for a patent is usually the inventor or a person...who has acquired the inventor's right to apply; the prescribed conditions usually include the payment of fees and requirements concerning the extent to which the invention must be described. This description is, at a certain stage of the procedure, disclosed to the public."

An important feature, as would appear from the above, is that the owner of a patent has a right to exclude others from using the patented invention. (This right, of course, is subject in most countries to certain limitations.) A country's industrial property law is territorially limited. It has effect only within the jurisdiction of the country. Therefore, a country's own law is the only law that has a direct effect on a patent in a particular country. Notwithstanding this, the application of specific technology which is covered by a patent in another country or covered by a patent registered by a foreigner could lead to several points of conflict, particularly since a patent not only provides a right for a person to use this knowledge but also excludes others from using it.

For a period of years and spread over a very large number of patents, this double-edged provision has caused patents to be put to several abuses. Some of these include the territorial restrictions imposed on export of products made with the patented knowledge, restrictions on outputs or sales; financial provisions related to payments for unused patents,

package licensing, payment of royalties throughout the entire duration of manufacture of a product or the application of a process involved without any specification as to time, price fixing including excessive prices, discriminatory royalties and the transformation of royalties into capital stock. In addition, a number of other abuses limit the use of patented inventions or related know-how once the patent has expired, limiting them as regards the field of use and imposing other limitations such as grant-back provisions and limitations on the research and technological development efforts of the licensee and the management of the licensee.

Several countries, to protect themselves, have evolved instruments to deal with such abusive practices in patent licence agreements. These include patent laws describing specific practices for exclusion, patent laws with a general statement making null and void clauses imposing on a licensee restrictions in availing himself of the rights conferred by the patents, anti-trust legislation, screening procedures or legislation on agreements and enacting special laws on the approval of technology.

The Indian Patents Act, under general principles applicable to the working of patented inventions, has spelt out the broad intention of granting patents as follows:

- "(a) that patents are granted to encourage inventions and to secure that the inventions are worked in India on a commercial scale to the fullest extent that is reasonably practicable without undue delay;
- "(b) that they are not granted merely to enable patentees to enjoy a monopoly for the importation of the patented article."

In view of the implications spelt out earlier, the national patent legislation in a country would have to cover several issues related to the granting and the use of the patents. They include, among others, important considerations related to definitions, nature of titles granted, requirements of patentability, non-patentable matter, search and examination, scope of disclosure, prior use of manufacture, duration, treatment of foreign nationals and priority rights, limitations of exercise, opposition to the grant of a patent, provisions on secrecy, grant of selling of patents, additions, amendments, restoration of lapses, revocation, working of patents, compulsory licences, etc.

"Patent system" indicates in fact acceptance of a set of diverse considerations pertaining to the privileges granted

through patents in different conditions. The patent laws of many developing countries were either based on the patent laws that existed in the countries which ruled them prior to their independence or are based on the laws that now exist in some of the developed countries with which these countries have very close relations. It is only recently that some of these developing countries have revised their patent laws so that their national laws could protect their national interests. In modelling their national laws, quite naturally certain provisions have been carried forward from other existing systems and one of the most important sources which has influenced the formation of such national laws has been the Paris Convention. Thus, the patent system would naturally take into consideration, among others, the following:

- (i) The legal principles and commitments contained in the Paris Convention.
- (ii) Promotional activities related to the advancement and strengthening of the principles of the patent system.
- (iii) The conceptual basis of the relevance and repercussions of economic development and the privileges granted through patents.

Some special features of the Indian Patents Act, 1970, which have a bearing on the building-up of a technological base in the country are outlined in the next section.

4. Special Features of the Indian Patent Having Direct Influence on Technical Development

The Indian Patents Act in its present form has incorporated several provisions taking into account the present state of development and its own and reported experience of patent acts in several other countries of the world. The Indian Patents Act, 1970 (Act 39 of 1970), and the associated patent rules came into force in April 1972.

It may be recalled that some 80 countries of the world are members of the Paris Convention, of which 44 are developing countries. India is not a member of the Paris Convention. Even today, more than 60 developing countries are not members of the Paris Convention. As mentioned in an earlier section, the provisions of the Paris Convention have influenced the patent laws of many countries irrespective of whether those countries are members of the Paris Convention or not. It is against this background that some special features of the

Indian Patents Act, 1970, are highlighted in this section.

National Treatment. A national law which provides for foreigners the same rights and treatment as it provides for nationals is said to apply the principle of national treatment. This principle is one of the basic requirements of the Paris Convention for the Protection of Industrial Property. The Indian Patents Act grants national treatment subject to reciprocity. Thus, no national of a country which does not accord to the citizens of India the same rights with respect to the grant of patents and protection of patent rights as it accords to its own nationals shall be entitled to any privileges under the Indian Patents Act.

Patentability. Patent laws of many countries single out or spell out certain areas which are not patentable. The Paris Convention permits such limitations to be made according to the requirements of any country. The Indian Patents Act has excluded from patentability any process for the medicinal, surgical, curative, prophylactic or other treatment of human beings or any process for a similar treatment of animals or plants to render them free of disease or to increase their economic value or that of their products. Similarly, inventions relating to atomic energy are also not patentable. Further, substances intended for use, or capable of being used, as food or as a medicine or a drug or substances prepared or produced by chemical processes (including alloys, optical glass, semiconductors and intermetallic compounds) are not patentable but the claims for the methods or processes of manufacture are patentable.

Substance and Novelty. The Indian Patents Act provides for the examination of the patent application as to substance. The Indian Act envisages the possibility of worldwide search and gives power to conduct such a search. The basis of this provision is that an invention which is published abroad before the date of the corresponding application for a patent would not qualify for the grant of a patent. This has rendered the examination of inventions more difficult than ever before.

Extent of Disclosure. Most laws require that the description should be sufficiently clear and complete to permit others skilled in the art to use the invention. Indian law requires that the description should be sufficient to enable a person in India possessing average skill in and average knowledge of the art to which the invention relates to work the invention. If this requirement is not met, the patent can be revoked.

Duration. Under the Indian Patents Act, the term of a patent is 14 years from the date of patenting. However, in the case

of inventions in the field of food, drugs and medicines, the term of patent protection is stipulated as 7 years from the date of filing the complete specification or 5 years from the date of sealing, whichever period is shorter. Mention may be made here of a school of thought which advocates that these areas should also be considered non-patentable. Taking into account the studies carried out in different parts of the world, the Indian Patents Act provides a fair and reasonable compromise between the extreme views of total abolition of patents in these fields, on the one hand, and a liberal protection of patent rights, on the other. In this way, the interests of the patentee as well as the interests of the public at large are reasonably balanced.

Priority. Many countries grant a right of priority to applicants in respect of inventions for which applications were first filed within a specified period of time in another country. This right of priority is one of the basic requirements of the Paris Convention, which provides a period of 12 months. The Indian Act makes provision for priority rights in cases required by international conventions.

Licensing. In the matter of licensing, elaborate provisions have been made to discourage the abuse of patents. Compulsory licences, licences of right and revocation are the provisions in this context.

Compulsory Licensing. At any time after the expiration of 3 years from the date of the sealing of a patent, any interested person may make an application to the Controller alleging that the reasonable requirements of the public with respect to the patented invention have not been satisfied or that the patented invention is not available to the public at a reasonable price, and requesting the grant of a compulsory licence to work the patented invention. An application under this section may be made by any person, even if he is already the holder of a licence under the patent, and no person may be prevented from alleging that the reasonable requirements of the public with respect to the patented invention are not satisfied or that the patented invention is not available to the public at a reasonable price, by reason of any admission made by him, whether in such a licence or otherwise or by reason of his having accepted such a licence. These provisions are expected to be more conducive to the working of the patent than the existing provisions of the compulsory licence under the Paris Convention. It has been remarked, in relation to the practical utility of the provision of compulsory licence in the Paris Convention, that "the long delays particularly in obtaining a decision through the courts would imply that forfeiture is

obtained only after the end of the life of a patent." Experience has shown that, involving, as it does, protracted legal proceedings before courts of appeal, the provision relating to compulsory licensing has not been nor is likely to be very effective even under the new Patents Act of 1970 since the patentee can delay the actual grant of the licence by resorting to judicial procedures. In this context, the Indian Patents Act has also provided for endorsing a patent with the words "licence of right."

Licence of Right. At any time after the expiration of 3 years from the date of the sealing of a patent, an application can be made for an order to have the patent endorsed with the words "licence of right" on the grounds that the reasonable requirements of the public with respect to the patented invention have not been satisfied or that the patented invention is not available to the public at a reasonable price. In view of the paramount importance to public health and well-being, it was considered that the licences granted for food, drugs and medicines must be simplified. Thus, every patent in respect of inventions relating to substances used as food, medicine or drugs and methods or processes for the manufacture of the above and such other materials are deemed to be endorsed with the words "licence of right" on expiration of 3 years from the date of sealing of the patent. The effects of the endorsement of the patent with the words "licence of right" are the following:

(i) A person who is interested in working the patented invention in India may require the patentee to grant him a licence for the purpose on such terms as may be mutually agreed upon notwithstanding the fact that he is already a holder of a licence for the patent.

(ii) If the parties are unable to agree on the terms of the licence, either of them may apply to settle the terms thereof.

(iii) The Controller of Patents can then decide the terms on which the licence shall be granted by the patentee.

(iv) Even before the terms are finalized, the Controller, pending agreement between the parties, may permit the patentee to work the invention.

(v) The royalty and other remuneration reserved to the patentee under the licence shall not exceed 4% of the net ex-factory sale price of the patented article. (The provision of this maximum limit of 4% is considered a reasonable return, taking into account the prevailing rates of royalties on similar agreements.)

Thus, there is a substantial difference between the compulsory licence and the licence of right. "In the case of the compulsory licence, the applicant must define his articles--and meet certain requirements--whereas this is not the case as far as the licence of right is concerned. This system may be specially attractive to developing countries because, once a patent is thrown open to licences of right, it will no longer depend on the will of the owner of the patent whether the patent is exploited in the country--anybody can obtain a licence and, on the basis of that licence, work the patented invention in the country."

The Indian Patents Act, providing for the issue of compulsory licences, the marking of the patent with the words "licence of right" and revocation, covers the reasonable requirements of working the patent. The reasonable requirements of the public shall be deemed not to have been satisfied

(i) if an existing trade or industry, or the establishment of a new trade or industry in India, is prejudiced;

(ii) if the demand for the patented article is not being met to an adequate extent or on reasonable terms from the manufacturers in India;

(iii) if the market for the export of the patented article manufactured in India is not being supplied or developed;

(iv) if the patented invention is not being worked in India on a commercial scale to an adequate extent or is not being so worked to the fullest extent that is reasonably practicable.

Impact of the Provisions on "Compulsory Licence and Licence of Right" under Indian Patent Law. The number of compulsory licences that have been issued, and the process by which these have been issued, is an indication of the inefficacy of this tool in the patent system. Over a period of 5 years not even ten compulsory licences seem to have been issued in the world. During 1973-74, three applications for the grant of compulsory licences were sought in India. One was withdrawn, a second was refused as the term of the patent in respect of which the licence was sought had expired, and the remaining one was pending. During 1974-75, two applications for compulsory licences were still pending. During 1975-76, the grant of a licence in relation to the staves used in carding engines or machines was refused to one of the applicants in view of the time limit prescribed for the various stages. A licence in respect of a patent relating to flyers for spinning jute

fibres, which was originally applied for in 1974, was ultimately granted in 1976. However, the applicant then found that he could not use this licence without infringing two other patents owned by the same patentee. In view of this fact, the licence was also granted against these two patents.

The provision of endorsing the licence with the words "licence of right" also does not appear to be meeting the overall requirements of accelerating industrial development. Out of about 3,000 patents filed every year in India, 673 were endorsed with the words "licence of right" during 1975-76. A major part of these (84%) related to chemical processes, 12% related to drugs and 4% related to articles of food. In the subsequent year, the number of licences endorsed with the words "licence of right" showed a steep decline to around 273, with approximately the same distribution in the different categories related to chemical processes, drugs and food articles. During the current year, the number of such licences over a 10-month period is only of the order of 60, with almost the entire number in the chemical process sector. Thus, it appears that the provision of the licence of right has resulted in a situation where patents relating to these areas, namely, chemical processes, drugs and food articles, are no longer being presented for registration.

In brief, it appears that both the provision on "compulsory licences" and that on "licences of right" have not yielded the results expected of the patent system in India.

Importation of Patented Articles. The Indian Patents Act provides, as a ground for granting compulsory licences, licences of right or revocation, that demand for the patented article is being met to a large extent by importation or that commercial working in the country is being prevented or hindered by the importation of the patented article by the patentee. In addition to acts on the part of the patentee, the provision also covers such acts by persons under the patentee, persons directly or indirectly purchasing from him, or other persons against whom the patentee is not taking or has not taken proceedings for infringement.

Use by the Government. The provisions relating to the Government's use of patented inventions are basically along the same lines as those in the patent laws of many other countries. The use of a patented invention by the Government is subject to the payment of royalties agreed upon by the Government or its authority and, in this way, the interests of the patentee are fully safeguarded.

5. Patents in India

The objective of the new Patents Act is to promote research and inventions and to accelerate indigenous industrial growth through a well-regulated patent system and prevent the exploitation of a monopolistic patent position.

It is known that most of the patents which are in operation are held by the nationals or corporations of the developed countries. The number of patents in force in India is 28,000, of which 3,000 are held in the names of Indians. Around 1960, Indians held 1,600 patents out of a total of some 19,000 patents. Around 1965, the number of patent applications in India was about 6,000, a number which has gradually decreased in recent years. Currently, around 3,400 applications are received each year. Out of these, some 1,200 are from Indians. Of the total of applications for patents which originated abroad, the largest number (about 20%) were from the USA, followed by West Germany (10%), the UK (12%), France, Switzerland and Italy (about 3% each).

In the field of chemical engineering, patents originating from abroad related mainly to the preparation of antibiotics, synthetic drugs, dyes and polymers. Indian inventions were in the field of antibiotics, dyes and polymers. Inventions in the field of inorganic chemistry from abroad were mainly for the preparation of phosphoric acid, ammonia and aluminium fluoride. The Indian inventions in this area related to activated alumina, synthetic cryolite, oxidation catalysts, explosives, etc. Most of the patents for metallurgical inventions currently come from abroad in the area of casting of metals, particularly continuous casting. New processes developed were in the areas of producing gases like carbon monoxide (CO) and freeing gases from dust particles. Indian patents were in the field of fuels, including ashless liquid fuel, domestic fuel briquettes and coal by-products, etc.

In the field of food and agriculture, the recent inventions having their origin outside the country related to food stuffs such as milk chocolate, cheese, edible protein and cooked meat. Indian inventions related to the designing of cooking appliances such as pressure cookers, kettles, smokeless ovens and appliances such as grain driers, power tillers, etc. In the field of health and sanitation, inventions from abroad related to the preparation of pesticides, herbicides, fungicides, weedicides and rodenticides, vaccines and analgesic compositions. Indian inventions related to insecticidal compositions, skin compositions, ayurvedic medicines for fertility, etc.

In the field of civil engineering, inventions from abroad related to panels, wall elements and rail fastenings, and those within India related to bricks, construction modules, concrete structures and railway sleepers. In the mechanical engineering field, inventions from abroad related to disc brakes, braking systems, aircraft structures, centrifuges, welding apparatus, rotary engines and tyres. Indian inventions related to development of bearings, centrifugal pumps, bicycles, converting petrol engines to diesel engines, variable speed drive mechanisms and weighing balances.

In the power engineering sector, the trend was towards developing electric storage batteries, dry cells, electromagnets, electric shock control devices, electric geysers, emergency lights, electric furnaces and electrostatic separators, etc. In the electrical communication field, inventions from abroad related to semiconductor devices, pulse generators, electronic switches and digital filters. Indian inventions also related to semiconductor devices and pulse generators. In addition, Indian inventions concerned development related to telephone systems, and television and display devices.

In the field of textile technology, inventions from abroad related to spinning machines, carding machines, winding machines, crimped yarn, non-woven textiles and polyester fibres. Indian inventions related to looms, dress fasteners, bleaching of textiles and fixation of dyes on textiles. Several miscellaneous inventions related to stoppers, seals, pilferproof caps for bottles, measuring instruments, binoculars, microscopes, photographic accessories, razor blades, blade dispensers, electronic table clocks, aerosol sprayers, etc.

From the above it can be seen that Indian patents now cover a wide range of industries. In the past, Indian patents were mainly in the field of cottage industries and small-scale industries. Out of over 1,000 patent applications currently filed every year, about 70% are from Maharashtra, West Bengal and Delhi, indicating that the location of industrial centres has influenced them to a very great extent. Patent applications were also filed from national laboratories, technological institutions (IITs and IISc) and other universities. However, some of these institutions do not have adequate facilities and experience in patenting procedures. The National Research Development Corporation of India (NRDC), an institution in the public sector, provides assistance to such institutions and entrepreneurs in obtaining patents for their inventions, and also acts as a source of patent information for inventors and institutions. NRDC also acts as a technology

transfer agency for a large number of R&D institutions in the country.

The number of patents in force in India, estimated at about 24,000, is very small compared with the patents in force in the world, estimated at more than 3.5 million. The number of applications filed in India per year is currently about 3,000 and at the same time around 3,000 patents fall into the public domain. The number of patents filed annually in the world is estimated to be about 400,000. After the new Patents Act came into being in India, the number of foreigners registering patents in India dropped. The number of applications for patents from Indians has remained stationary at a little over 1,000 per year over the last 10 years. However, as a percentage of the patents filed in India, the share of nationals is now around 40% compared with around 12 to 15% a few years ago. Thus, as a whole, it would appear that in India the role of Indian patents in industrial growth has not been a very major factor.

6. The Patent System in Technology Development

Technology may be looked upon as having two aspects, one pertaining to the domain of scientists, engineers and industrialists, who endeavour to produce a certain product, and the other being visualized as that of the user, who may or may not appreciate a given aspect of the development process. However, the latter still has a place in the scheme since he finally pays for the product that is produced from technology. Often, being ignorant of the cost involved, he may pay a larger cost than that which should be legitimately payable by him at a certain point of time. However, the society in which he lives is anxious that the price he pays for a product should be fair. In this context, the development of technology does in fact, in its final phase, go through several tests related to the acceptability of the product, both with respect to quality and cost, methods developed to overcome customer resistance to certain products, market research, advertisements, education and several other promotional activities. Thus, from a policy-maker's point of view, both aspects of technology described above are important. Many of the patent laws, while giving protection to those who develop the technology, do not make any provision at all for safeguarding the interests of the user. It is true that the patent laws were initially developed to protect the interests of the inventors, not only in giving rights to those who use them but also in excluding the use of the rights to others. In this context, it is but natural that in the overall development of technology the role of patents should be considered as only a part of a larger system.

Justification for granting patent monopolies hinges on three principal factors:

- (a) providing by various alternative means a fair and just reward to the inventor;
- (b) encouraging individual inventive activity;
- (c) giving an inducement to inventors to disclose their secrets to society. (This would enhance the stock of publicly available, though not publicly usable, knowledge.)

While all the above aspects have been discussed at great length, no conclusive empirical evidence has been provided for or against any of these propositions.

A principal function attributed to a patent has been to encourage prompt and adequate public disclosure of new technology. However, this objective is not very often totally fulfilled by the patent system. Apart from the freely available and usually older technologies, one of the important determinants of the conditions relating to access to technical knowledge is the nature, extent and functioning of patent regulations. Here, not all modern technology is covered by patents. An important part of the technology that is not so protected is mainly secret and for this reason, among others, the relative role of patented and non-patented technology cannot be ascertained with any degree of precision. Often, technologies of products that are not themselves protected involve inputs or elements of processes that are patented. There are instances where processes have been left unfinished in certain countries because they would not be economically usable under the conditions prevailing in those countries. Yet, the availability of this information could, with advantage, be a substantial input in other parts of the world where the circumstances are likely to be favourable. Thus, the overall objective--that patents would permit disclosure of knowledge--has not always been fulfilled.

The information given in a patent specification is expected to be detailed enough to enable anybody who has adequate knowledge to reproduce the item himself without the active support of the inventor. In actual practice, this does not always happen. Something is always held back, especially in important processes, and therefore it is not possible to work the invention without the active support of the inventor. In many cases, particularly where the technology is highly sophisticated, the invention, although sufficiently disclosed, may be difficult to execute quickly and economically and hence

competitively. In such cases, it is more desirable in practice to execute the invention with the practical cooperation of the inventor or, for example, by acquiring his related know-how than on the basis of the patent documents alone.

As regards the concept of encouraging individual inventive activity, several views have been expressed on the role of patents. Seymour Melman in a study for the United States Senate Subcommittee on Patents concluded:

"With or without a patent system, the efficient pursuit of knowledge in the universities and other non-profit institutions will continue, within the limits of available resources, so long as the production of knowledge is treated as a sufficient end in itself. Industrial firms will continue to enlarge their research in the useful arts as dictated by competitive needs, with or without patent privileges."

Another point that has been held against the role of patents for inventive work has been the necessity in most of the national patent laws to have certain areas that are not patentable. It is believed that such exclusion is in the public interest. Food, drugs, processes relating to their manufacture, chemical substances and technology relating to nuclear energy are examples of such exclusions. In the case of food and drugs, such an exclusion is based on the consideration that patenting would adversely affect the availability or the price of these goods. The reason for excluding nuclear energy is mainly related to considerations of national defence. In the case of chemical substances, the reason for excluding them from patenting is to ensure unrestricted availability. Thus, if only patents were to provide inventiveness, these are really the areas of the greatest importance where advancement would be retarded for want of patent provisions.

Another feature that has often figured in discussions is the principle of national treatment. While the principle of national treatment would appear on first reading to be a very logical and desirable feature, its application to two parties that are not equally balanced would eventually work for the benefit of the stronger. Thus, countries that are economically poor and scientifically far behind cannot take advantage of the principle of national treatment. It has been said that the patent system has, as a whole, come to act as a reverse system of preferences in the markets of developing countries granted to foreign patent holders. Such an inference has been based upon the following facts:

(i) nationals of the developing countries own a bare 1% of the world total of patents granted;

(ii) in the developing countries, foreigners own six times more patents than the nationals of those countries;

(iii) nearly 90% of the patents thus owned by foreigners are never used in the production processes of these countries.

Some of the factors discussed above have been responsible for the repeated reviewing of the various provisions of the international patent system. The British Committee which examined the United Kingdom patent system and patent law recognized in its report that "inventive activity and the development of new ideas were inherent in the human mind and would continue without any legal protection for the results." But it concluded that "a patent system increases the possibility of reward for the successful exploitation of invention and there can be little doubt that it does play a part in encouraging individuals to invent and organizations to create conditions in which inventions can be made." In this context it was remarked that "the patent system is probably very much like democracy in the sense that it is probably better than any alternative system which can be contemplated as operating on a continuing basis."

From the point of view of a developing country like India, where a sufficiently large scientific infrastructure has been built which is financed substantially by the Government, several forms of encouragement to promote inventiveness require to be built up. In India, national awards are given for exceptional work for the advancement of art, literature and science. Special awards exist for import substitution efforts by organizations and individuals and several other awards have been instituted and are administered through agencies like the Council of Scientific and Industrial Research, the Indian National Science Academy, the National Research Development Corporation of India, the Federation of Indian Chambers of Commerce and Industry, etc. In this context, the Indian patent system could also be considered as one of the same. In fact, as has been the experience in many other countries, the establishment of a patent organization in India is actually subsidized by the Government. During the year 1974-75, the total fees collected by the organization amounting to 2.7 million Rupees accounted for about 30% of the expenditure incurred by the Patent Office. In a country like India, where the building up of the technological infrastructure is a prime consideration, all forms and systems which could contribute to this objective have a role to play. Notwithstanding the abuses

to which it might be put, the patent system has been found to be a powerful incentive in several countries of the world. As such, it is expected that through the Indian Patents Act, 1970, a similar role will be fulfilled to a much more satisfactory extent.

Along with this development, mention may be made of some of the other schemes that have been implemented recently in India. These include the in-house industrial research and development (R&D) registration schemes, facilities for commercialization of technology, preferential licensing, fiscal incentives and R&D Cess [research and development tax].

Industries have been encouraged to set up in-house R&D units so that they may be able to carry out a part of the research essential to them within their own premises in an industrial environment. Requirements for equipment and raw materials needed for R&D activities involving imports to these units have been liberalized. The latest Import Trade Control Policy provides for the import of such items up to a value of 100,000 Rupees without an import licence. Provision also exists for processing larger requirements in the Department of Science and Technology, thus facilitating their import. During the last few years, over 350 units have been recognized, covering a very wide range of industries. Some of these are relatively small units, involving five to ten scientific personnel, while others are very large units comparable with the large national laboratories.

Schemes have been evolved by which the technology developed in the laboratories or in the in-house R&D units could be quickly brought to the stage of commercialization. Requirements for plant and machinery to build up pilot plants have been liberalized and they can now be imported as research and development equipment. Provision also exists for enabling agencies of the Government, like the NRDC, to take part in such pilot plant activities and, where so required, also to take part in equity participation.

Requirements for full-scale units in the form of prototypes can also be imported for research and development and in cases where the value of the prototype is less than 1 lakh* Rupees, the import can be effected without considering indigenous availability.

Licensing laws have been liberalized in respect of establishing production of items based on indigenous research and development activities. Provision also exists for expansion

* 1 lakh = 100,000.

of capacities likewise based on indigenous research and development activities. Industries based on indigenous technology developed in the national laboratories and those approved by the Department of Science and Technology no longer require a licence.

Fiscal incentives exist under the taxation laws for scientific research. In addition to allowing for complete writing-off of all expenditure incurred on scientific research, including acquisition of capital equipment in the year of its expenditure, provision also exists for amounts paid to scientific and research institutions. These fiscal measures taken as a whole could be regarded as perhaps some of the most generous in the world today.

Manpower and skills of a very high level have been made available to the nation and advantage can be taken of the vast infrastructure of the national laboratory systems for sponsoring research against a weighted tax deduction of 133%.

Test and instrumentation centres have been created on a regionwise basis for specialized and support services to various industries.

Certain industries are already contributing to a specific fund allocated for research and development purposes. Mention may be made here of cement research in the country where the selling price of cement includes a specified amount for research and development purposes. Under the existing Industrial Development Act, there is a provision for levying R&D Cess. This is already being levied for research in the jute industry. The possibilities of a levy on other industries is engaging the attention of the Government.

7. Conclusions

In the building of the technology base of a developing country like India, attention must be paid to self-reliance in the technologies that have been found useful in its industrialization. Since a part of this technology is derived from those developed outside the country, which are governed partly by patent rights, careful consideration has to be given to determining the assimilation of this technology and ensuring that continued dependence does not follow. It should also be noted that the patent itself cannot be blamed for the abuses to which it is put. It is hoped that the on-going revision of the Paris Convention will be influenced by a deep understanding of the needs of the developing countries, and will pave the way for more appropriate national legislation.

In building the technology base, it must be understood that the patent system is but one of several contributing measures. Thus, in framing industrial policy and technology policy, the various factors that will encourage inventiveness and utilization of technology should receive equal attention.

CLOSING ADDRESS

Felix Bandaranaike

Minister of Finance and Justice
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Mr. Chairman,

First and foremost let me thank you for having invited me this afternoon to wind up your very important Symposium on the Patent System. But before I make my remarks, I want to say how pleased we are to have been able to welcome all of you to Sri Lanka. I hope you have had a pleasant and enjoyable stay in our country, and that all of you have had a chance not merely to spend your time in our Conference Hall but also to look around you, get to know our people somewhat, make friends and perhaps take away happy recollections of our country when you return to your respective homes.

The World Intellectual Property Organization is probably the youngest of the specialized agencies of the United Nations, having joined the United Nations family only as recently as about 1974. I am told, however, by those who ought to know much more about these matters, that your history goes back really to 1883, to a time when none of us in developing countries had any real voice whatever in international affairs. With its entry into the United Nations, the World Intellectual Property Organization has become increasingly concerned with the needs and problems of developing countries. Its mandate as a specialized agency is to promote creative intellectual activity throughout the world and to accelerate the transfer of technology related to industrial property to the developing countries. Now whether this has actually happened or not and whether the World Intellectual Property Organization has succeeded in its efforts, I am really in no position to judge. I must say that we, as one of the poorer developing countries, have many, many problems indeed in regard to the transfer of technology on adequate terms and this is an aspect of the matter which I shall come to later in my remarks. The fact that this World Symposium is being held on the importance of the patent system to developing countries indicates how seriously the World Intellectual Property Organization has taken its mandate from the United Nations. It is my expectation that the activities of the World Intellectual Property

Organization will complement in a creative fashion the activities of other United Nations organizations and bodies engaged in promoting the transfer of technology to developing countries in a manner that would promote their effective economic development.

Mr. Chairman, in this concluding address to your Symposium, I thought of covering three broad areas. Since the transfer of technology under the patent system is bound up with the process of foreign investment, I should like to say a word about our Government's policy towards foreign investment. The last time I did that was in the 1975 budget and they are still arguing whether what I did was right or not in the context of our local politics. Secondly, I propose to deal more directly with the kind of role I see for the patent system both nationally and at the international level. Thirdly, I should like to use the opportunity of speaking at this late stage of your deliberations to comment fairly generally on the points of view that have emerged on patents in this gathering in relation to the point of view I have myself chosen to express on behalf of our country on this question.

For quite some time it has been apparent to all of us that given the degree of import substitution that is feasible and the ever-weakening international market situation in which Sri Lanka's traditional export industries are being placed, particularly tea, rubber and coconut, the development of a substantially new export sector would constitute perhaps the only basis for providing the country with its minimum foreign exchange requirements for a more rapid pace of development. It is in the development of this kind of new export sector that we can see a crucial role for a new type of foreign investor who would fade out once he has performed the function of a catalyst. What I have in mind is an arrangement under which a foreign firm would undertake to set up a factory, for instance, bear the risks of profit and loss and provide the necessary technicians and technological expertise. The Sri Lanka Government, on the other hand, would permit the remittance of profits and capital, regulate the terms on which technology is transferred, secure facilities for the training of Sri Lankan personnel and then take the enterprise over in due course, after a specified period of perhaps 10, 15 or 20 years, depending upon the enterprise. In other words, the enterprise itself would be taken over by the Government or its nominees in the private or public sector on terms clearly agreed upon and specified in advance. This, briefly, is the kind of framework which was recommended long ago in

Sri Lanka to our late Prime Minister, Mr. S. W. R. D. Bandaranaike, by no less a person than Professor Gunnar Myrdal. It is also the kind of framework which our friends and neighbours in other South East Asian countries have adopted. The Socialist Republic of Viet Nam is one that comes to my mind, as they seek to grapple with the tasks of development following upon their emergence from a protracted war.

The institutional framework for foreign investment that I have described is, if I may say so, a form of euthanasia for the investor by mutual agreement. It replaces the uncertainties attendant on political change in a country such as ours by the certainty of eventual extinction of the investor at the end of a period which must be long enough to permit him to enjoy a reasonable return on capital and the host country to learn how to manage a new investment of which it had previously little knowledge or experience.

In the absence of such an investment framework, we have hitherto had in Sri Lanka vague attempts to create an attractive investment climate which in the end have come to nothing. We have had several governments in Sri Lanka since independence. Perhaps there are not many countries among the developing countries of the world, particularly in the Commonwealth, which have had the experience of changing governments five times by means of peaceful elections. We have a political party here, reputed to be the friend of big business, which has tried to create all the opportunities possible to keep a potential investor happy. But in practical terms what has happened? So long as that party was in power, there has been a net outflow of capital. Nothing worth while has ever come in, and the reason is that the investor says to himself: "We like your Government very much, we like the investment climate you have created, but, unfortunately, it does not last very long; the Sri Lanka Freedom Party (to which the Minister who is now speaking to you belongs) might come into power with disastrous consequences, and therefore, perhaps we had better not come in after all." And when we are in power, developments work the other way. The investor says to himself: "We never quite know; these people talk in terms of the extinction of the investor, and therefore, in this context, is it really worth our while coming here at all if we are going to be nationalized or taken over? Perhaps we had better wait, hopefully expecting the other Party to come in." The net result is that we do not get adequate foreign investment.

Now, to solve this problem, we did attempt to introduce certain techniques. One solution was brought up by me in 1975, soon after I assumed the office of Finance Minister

for the second time. I was the Finance Minister in 1960 and on that occasion we had the same problems as we have now. We had not made much progress on the foreign investment front. But this time, during my second term of office, I came up with a new proposal. I thought it might be a good idea, since we are a Parliamentary democracy, to establish a Foreign Investment Committee as a permanent institution of our Parliament, in which would be represented every shade of political opinion in the country, both in Government and in Opposition. And I thought that every investor's proposal should be processed by that Committee so that the points of view expressed should become public knowledge. If I were the investor, I would be most interested to know the political reaction of the host country to the proposal I was making; whether indeed it received universal support or not, and what view would be taken of the investment by a political party which had a prospect of becoming a government. The result would be that the investor is provided with notice and knowledge of the reactions of every Member of Parliament, not merely in the Government group. If I were an investor, I would certainly hesitate to bring any money in unless I were to get a universally favourable reaction to the details of an investment proposal and an assurance that from the host country's point of view the investment is considered safe; that it will be safe from subversion, safe from the danger of huge multinational corporations coming in and swallowing the country up, with the power of their money. Equally, it is important that the investor should feel that whatever investment he brings in is also not going to be swallowed up by a hungry government. So we have to devise arrangements for making sure that everybody's interests and points of view are protected.

Now the best way of doing this is through appropriate legislation. But on that score, we ran into problems. We were a Coalition Government ourselves, which included the Communist Party, which took a different view of this problem. The Communist Party was not happy about foreign investment at all and would have preferred the country to adopt a policy of total self-reliance without imported technology, without patents, without any of these things. Their view was that the country would be able to grow without any unnecessary foreign help unless it came from impeccable Socialist sources. The result was that the foreign investments legislation was left over for discussions which never in fact took place. Then in August 1976, during the time of the Non-Aligned Conference, our Prime Minister held a Press Conference for foreign journalists and, when asked about the Foreign Investment Guarantee Law, indicated the

difficulties she was having in proceeding with the law at that time and argued that perhaps the best thing to do in the circumstances was to leave the matter over till after the General Elections, due in mid-1977, since there would, in any event, be little prospect of anyone bringing in foreign investment until the situation in this country after the elections became known.

The kind of investment framework I have sketched out in the course of my preliminary remarks permits the investor to seize the real opportunities for investment that exist, not for vague reasons of a generally favourable "political climate" but for reasons of the underlying economic considerations. Sri Lanka, after all, constitutes an attractive labour market. Our prices are relatively cheap and the cost of living--although we grumble a lot about it--is still low compared with levels elsewhere. If you are seeking to manufacture for export, you will be dealing with people whose fingers are very dextrous and skillful, people who have the capacities; where you would probably have to pay 1½ to 2 dollars an hour for labour in the more developed countries of the world, you would still be able to hire skilled labour in this country at a cost of less than a dollar for a day. So much then for the investment framework.

I have said already that the design I have outlined for foreign investment provides also for the regulation of the terms on which technology is transferred. I should like, in this second part of my talk, to define a little more precisely what I mean by this. In the first place, the very acceptance of a "fade-out" principle (where the investor is given a specified time-horizon as the basis for the negotiation of a foreign investment) constitutes a fundamental departure from the terms on which technologies have generally been made available in the past. Technical collaboration agreements that are indefinitely extended from time to time are not only a source of increasing costs for the host country through royalties and patents; they also contribute to perpetuating a state of technical dependence in the host country and become a barrier against the emergence of an indigenous technology. Once, however, a definite term of years is set to an investment, it must follow that the same time limit applies to the transfer to the host country of all the necessary technological processes associated with that investment and the building up of a corresponding body of indigenous skills and know-how.

How important this consideration is emerges from a recent analysis of the process of technology transfer in Sri Lanka undertaken under UNCTAD auspices. The study

covered a group of 20 industrial enterprises over the period 1968-1970. The total capital investment of this group of enterprises was Rs. 44.65 million, of which the foreign equity participation was Rs. 23.15 million. The sample total is significant in relation to the value of private foreign investment in Sri Lanka's manufacturing sector, which amounted in 1971 to only Rs. 110 million. The total foreign outflow over the three years 1968-1970 on account of patents, licences, technical services, salaries and dividends was Rs. 14.35 million--an annual average rate of Rs. 4.8 million or 21 percent of the total foreign capital invested. Of this annual outflow, that on patents and licences was as high as 18.8 percent and that on technical services 8.3 percent. In other words, those activities which count as the direct cost of the transfer of technology amounted to as much as 27 percent of the annual outflow. Clearly, therefore, any arrangement which puts a term of years to the other outflows arising from the act of investment, such as salaries and dividends along with a provision for technological self-reliance built into each foreign investment contract, ipso facto terminates the financial drain on account of the costs of technology transfer.

This apart, how much further can any government reasonably expect to go in curbing the costs of technology transfer? It seems axiomatic that if intellectual property is not rewarded on a certain minimum basis, the incentive to innovate--and equally the incentive to set apart research and development budgets on which innovation itself depends--will sooner or later dry up. On the other hand, it is equally obvious that the amounts paid out for technology by way of patents, royalties and fees are today far in excess of what may be considered a reasonable rate of return on intellectual property. The concerns on this score are symbolized by the attempts in UNCTAD to negotiate a code of conduct for the transfer of technology and within the World Intellectual Property Organization itself to revise the Paris Convention relating to the industrial property system.

However, pending the institution of international arrangements to ensure technology transfers on more reasonable terms, I should like to ask myself what it is open for any single country like ours to do. A part of the answer has, I think, been provided in Sri Lanka's case by a somewhat devastating study of our own practices in screening technology transfers completed as recently as November last year by an UNCTAD Mission. That part of their analysis which I have described as devastating could be summed up as follows in their own words:

"There is, in fact, no well-conceived policy framework of national objectives and priorities for the transfer of technology in Sri Lanka. What is lacking is the regulation of the flow of foreign capital and the technology it brings into the country so as to make it a scaffolding for self-generation of domestic technology and exploitation of domestic resources. The present policy framework does not demarcate the areas where domestic technology should have preference, taking into account progress being made in creating domestic technological capability; and, as a consequence, where foreign technology can be permitted and in what form. It does not clearly lay down specific criteria for the screening function which includes technological evaluation and investigation and assessment of the terms and conditions of specific technologies in the light of the international market situation. Neither does it prescribe a code of conduct-- a list of 'dos' and 'don'ts,' for the technology supplier, nor provide for adaptation and integration of the imported process with the domestic technology system. In short, the country at present does not have a clearly articulated policy framework to monitor and regulate the import of foreign capital and technology for the conscious pursuit of industrialization as an economic objective."

The study is replete with examples which indicate that the authorities appraising and approving foreign investment take at face value the case built up by a potential investor for the terms of technology transfer, which, of course, is a most one-sided approach. The difficulty appears to me to be the lack of any independent market-based yardstick against which the terms of any proposed arrangement for the transfer of technology can be evaluated. The remedy, equally clearly implicit from this diagnosis, is to develop knowledge of alternative terms and conditions on which technology is likely to be made available within the appraisal system, and it is this which UNCTAD has proposed for Sri Lanka in the form of a Centre for Transfer and Development of Technology, to be located within our own Ministry of Industries.

There is, in this area of improving one's negotiating and bargaining capacity in relation to the transfer of technology, a great deal that Sri Lanka can, in my view,

learn from the experience of other countries, and I shall devote therefore the final part of my address to some appraisal of the suggestions that have emerged directly through your own Symposium here. It is evident that countries with a greater degree of experience in dealing with foreign investors than Sri Lanka possesses have evolved procedures which keep the direct costs of technology transfer to a minimum and there is scope clearly for paying greater attention in Sri Lanka to the terms and conditions of technical collaboration agreements, both at first signing and when the question of their renewal comes up once again, for modifying certain existing collaboration agreements so as to ensure maximum export opportunities, and for better coordination in the purchase of know-how. These areas would, it is expected, receive the emphasis they deserve in the context of the UNCTAD Mission's recommendation to Sri Lanka to move ahead with a Centre for the Transfer of Technology. At the international level, the problem of getting the best terms in purchasing know-how could be significantly eased by the implementation of another suggestion made at your Symposium--for the establishment of an International Technology Bank which could have the effect of curbing the transmission of out-dated technology and of obsolete equipment.

More specifically, your Symposium has been concerned with the extent to which the patent system promotes or hinders the transfer of technology, and has provided a forum in which both those at the giving and those at the receiving end of this process of technology transfer can say their piece. What I find most impressive is the fact that no one seems to have questioned the basis of the patent system, implying perhaps an acceptance that some form of protection for intellectual property is a sine qua non if the process of innovation is to continue. The concern has rather been with limiting and preventing the possible abuses of the patent system and the exorbitant drains on a developing country's resources that such abuses could involve. A major theme developed in more than one speech has been that a very large proportion of patents in developing countries is in the hands of foreign-owned corporations, and that for the most part such patents are not used for production in the developing countries, with the result that there is a foreign exchange drain involved in the importation of the patented article from abroad.

The thought I would leave with you at this stage is how far the kind of assured framework for foreign investment that I have tried to define could make a difference to this situation. Since the rights and obligations of both investor and host are defined precisely in advance for a term of years, and so long as developing countries refrain from making competitive concessions for the purpose of attracting foreign investment, there is the possibility that the uncertainties that would otherwise hinder the activation of unused patents would be eliminated. In other words, the type of framework governing investment in a developing country that has a bearing on the riskiness or otherwise of an act of investment would make all the difference as to whether that investment takes place or not and whether therefore patent rights associated with that investment are used or not.

CLOSING ADDRESS

Arpad Bogsch

Director General
World Intellectual Property Organization

Mr. Minister,
Ladies and Gentlemen,

In the name of the World Intellectual Property Organization, I should like to say a few words at the close of this Symposium.

It was truly a world Symposium since we had participants from Asia, as well as America, Africa, the South Pacific and Europe.

It has, I am convinced, achieved the goal that had been set: a better appreciation of the role of patents in that most important objective of all developing countries --transfer of technology.

It achieved its goal thanks to the excellence of the speeches delivered and the great interest of the discussions which followed the speeches. WIPO is grateful to all the speakers and other participants for the sacrifice, in time and money, which their coming to Colombo has meant for them.

I hope, however, that you have found the sacrifice worth while, both because Sri Lanka is an exceptionally beautiful country with exceptionally kind, hospitable and forward-looking people, and also because you have contributed significantly to a better understanding between the peoples of a great part of Asia and the highly industrialized countries, whether capitalist or Socialist.

But the fact that the Symposium has achieved its goal is due also to the attitude and the cooperation of the Government of Sri Lanka. That your Symposium was looked upon with favor in the highest places is proved by the

gesture of the President of the Republic and its Prime Minister, who both expressed the wish to hear about its progress and graciously received me to have my report on it.

Furthermore, the first and the last speeches were given by two Cabinet Ministers: yourself, Mr. Diaz Bandaranaike, and Mr. Ilangaratne. We are grateful to both for the interest they have manifested and their inspiring speeches.

Finally, we are grateful to all those numerous personalities who organized and ran this Conference, in a beautiful room, with excellent facilities, unfailing courtesy, and one hundred percent efficiency.

In this connection, our thanks go naturally to you, Mr. Sanmuganathan. I know the enormous amount of work that you, who are an exceptionally busy man even without an international meeting, have had to devote to this Symposium. Our thanks go also to the Registrar of Companies, Mr. Wijeyekoon, and his collaborators, who also worked practically day and night throughout this week, and for some time before it. You can be proud of your work, which has resulted in the faultless organization of our Symposium, which I hereby declare closed.

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