

Dr. V. Siddhartha  
Adviser

December 3, 1984

Dear Dr. Ambasankaran,

I thank you for your letter No. CAT/84/103 of November 20, 1984 which I have just seen. There is in much what you say which is of value, but I find that our "economics community" is locked into paradigms that are wholly inappropriate to our total situation.

You make substantial reference in your address to Japan, with the implied conclusion that the Japanese experience can hardly be transplanted one-to-one into our situation. I could not agree more. For what it is worth, I enclose for your perusal and retention an article on the subject of the appropriateness (or otherwise) of the Japanese model to the Indian situation.

With kind regards,

Yours sincerely,

*V. Siddhartha*  
V. Siddhartha

Dr. C. Ambasankaran,  
Officer-on-special-duty,  
Bhabha Atomic Research Centre,  
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Trombay, Bombay-400 085.

Encls:- As above.

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Review of Economic, Political &  
Social Development, pp. 157-187 )*

ISSUED ON

BY

*Som...*

C.S.R. NEW DELHI

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TELEPHONE

तास :- बार्क-चेम्बुर, बम्बई

TELEGRAMS : BARC-CHEMBUR, BOMBAY.



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भारत सरकार  
GOVERNMENT OF INDIA

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BHABHA ATOMIC RESEARCH CENTRE  
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C.Amba sankaran  
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Ref: CAT/84/103

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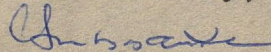
Dear Dr. Siddhartha,

Thankyou for your letter dated November 14, 1984.

Please find enclosed herewith an <sup>\*</sup>authentic copy of my address at a Seminar on Technology Transfer organised by the Birla Industrial and Technological Museum Calcutta on 13. 11.1984.

With regards,

Yours sincerely,

  
(C.AMBASANKARAN)

Dr. V. Siddhartha,  
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\* copy released for the press.

## TECHNOLOGY DEVELOPMENT & TECHNOLOGY TRANSFER

BY

C. AMBASANKARAN  
Centre for Advanced Technology  
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It is now an accepted fact that technology has come to play a crucial role in the economic development of any country and for raising the standard of living of the people. In India, technology development in the true sense has taken place only after independence over the last three decades. In the first part of my talk I would like to trace briefly how this development has taken place. For the purpose of our discussion I would like to classify technologies either as 'high' technology or 'base' technology. Base technology may be defined as one which is essential to support the present day industrial infrastructure and subsequent economic growth. We need the basic technologies to promote self-reliance and industrial growth. On the other hand the 'high' technology is one which is possessed by a few but one with promising development potential for the future.

Typical examples of base technologies are, the production of iron and steel, cement, chemicals & fertilisers, heavy machine building industries, machine tool manufacture, heavy electrical power-generating machines, surgical instruments and pharmaceuticals etc. From the early 50s, in all these areas massive investments have been made both by public and private sectors and wholesale factories have been transplanted in the different parts of the country through collaboration with industrialised nations. The situation may be compared to what happened in USSR

following the political revolution after 1920. Large teams of young engineers have been trained in the factories abroad to man and operate these industrial undertakings. In the process of setting up of these industries and get them into operation, we have had some teething troubles, but I am happy to say that a large number of these have been overcome and we are getting on stream. However it will be pertinent to point out that the state of technologies in these enterprises are in the same stage as they were transplanted three decades ago. No attempt seems to have been made to update the technologies.

In contrast to base technology in the areas of 'high' technology the approach of the Government has been different. Typical examples of such technologies can be found in the field of Atomic Energy, Space Science and Electronics. Massive investments to the tune of Rupees 1000 crores have been made by the Government and private organisations annually in R & D. Eighty percent of the amount has been spent by the Government agencies like the Department Atomic Energy, Department of Space, the Council of Scientific & Industrial Research and Defence Research & Development Organisations. All these areas are not directly related to basic or commercial technology. Today the country is in a position to put a satellite into orbit and build nuclear reactors based purely on indigenous development. We also have built up a strong R & D base to improve on these technologies. And yet we lack the basic know-how to design and manufacture a color television tube or motor car.

The low impact of Indian R & D in base technologies can be best highlighted by the fact that in 1981-82 only 492 local patents were sealed with the Indian Patent office. Of the 17,930 patents in force about 5/6th (14,892) are of foreign origin that are registered to protect foreign patent holders in respect of technological innovations developed abroad. The lack of momentum in generating indigenous know-how forces the country to look abroad for further inputs. This condition will persist until the R & D does not focus on commercial technology.

Technology has been recognised as very crucial for success in a competitive environment. It has also far reaching effects on the economy of the country. The flow of know-how and innovations between various industrial sectors eventually results in a chain of product improvement and cost reduction. Key innovation originating from a few industries may be responsible for generation a vastly disproportionate amount of technological change, productivity improvement and output growth in the economy. The microprocessor can be cited as a typical example which has resulted in the creation of a number of new products and new processes. Unfortunately in India the role of technology as booster for economic growth has not been given sufficient importance. Instead there is always emphasis on developing industrial self-reliance through technology transfers. The ultimate result is that the technological gap is growing. It is growing because the pace of development in industrial countries has started accelerating. Product life cycles are getting shorter with computer based technology being extensively

used for design and manufacturing control. The present technology base that India has is not relevant to the 1980s. Immediate inputs are required to bring this base to a level where it is in a position to create new technologies independently and sustain growth. In the absence of such inputs the majority of local manufacturing units are producing goods which are not competitive in world market - a typical example can be found in the steel industry.

Every body agrees that there should be a national policy on technology development. Yet there is no actual consensus of what should be the Government role in promoting technology. Any government directed effort in technology development is bound to be slow on account of various approvals and clearances that ~~they~~ have to be obtained at different levels. The decision making machinery becomes extremely slow. A typical example is of a setting up of a glass shell manufacturing plant for television tubes. The delay in the sanctioning of this project over several years due to various reasons has escalated the cost by atleast by a factor of three.

It has been argued in several quarters that the Japanese approach to technology development may provide some clues as to how a Government can best provide positive direction. The private sector dominates Japanese R & D efforts. As a result the emphasis on application to research in Japanese companies are goal oriented and their research focussed on a few defined objectives only. These objectives are determined by market place. The role of the Government is limited to encouraging leading companies to form consortiums to develop key technologies of the future. In this system

workable under Indian conditions? One should not forget that Japan is a small country. It had an advanced industrial society even before the second world war. They are a single cultural unit with one language, one religion and common social traits. The influence of fascism on Japanese intelligentsia was strong. Discipline, hard work and devotion to duty are the positive sides of fascist philosophy. These qualities are drilled into ears and minds of Japanese people, the workers, peasants and all levels of population. They are exhorted to aim high and achieve superior results. Though they were defeated during the last war the rigors of fascist discipline for building up character to face up to any challenges and their morale was not broken. It was unmistakably high after the world war when they launched on the reconstruction of the economy. Excellence in economic achievement became new goal with commensurate objective and methods and new set of human values. The pride of the nation was to be demonstrated to the world again. This time living in peace and with peace in the economic field under conditions of free and fair competition, these objectives found expression in the style of industrial management which has been resulted in their success in economic development.

India on the other hand was a colony under the British rule till it became free in 1947. Reconstruction after independence had to embrace whole range of factors affecting the people's life - the political system, the economic policy and the methodology, the social values, relation with other countries, the massive aids for investment, the defence expenditure, the internal stability and so on. One should not forget that India is a very large complex country with many languages and religions.

Even though some of the country's outstanding achievements have come out of the vision and colossal lead given by Pandit Nehru the people at large have not developed qualities of social conscience abiding love for the country, hard work and discipline, which are fundamental to progress. These draw-backs stand out glaringly when compared with Japanese. Mass literacy is still a long way off. Thanks to the political mechanisation, the linguistic and cultural differences in the country have aggravated and have started to percolate into the industrial system. Most of the Workers Unions are controlled by political parties, who use them for their own benefit. Because of imbalance in regional developments, people tend to become furiously conscious of regional claims and identity thus destroying the image of oneness.

Most of the ills of our economy and industrial relations can be traced to mistrust and contempt of the worker. Most of our executives are products of feudal culture where the boss-subordinate demarkation is pronounced. The lust for power and authority persists merely in the executive classes. The numerous devices employed by management to outwit the workers have forced the Government to intervene in the form of labour legislation. While management in Japan sincerely strive to solve the disputes with workers with mutual confidence it is no wonder that the Government in Japan keeps aloof unlike in India.

The outstanding feature of the Japanese style of management is a genuine concern for the worker and his whole personality. It proceeds to develop him economically, socially and spiritually. The rest of its progressive facets naturally follow. Thus the life-time employment acquires a meaning in Japan.

I would therefore like to conclude by saying that it will be odious to compare Japan with India either in Technology Planning or in management practice. The Japanese are becoming very efficient and devoted to longer working hours, a situation which they must correct in time before it becomes counter-productive. Our cultural tradition believes in a proper balance between work home, leisure, employment and spiritual thinking. Let us strive on all sides to ensure that the eight-hour work becomes meaningful and fruitful.