SECTION 7

AUTHOR'S REPLY TO ORAL AND WRITTEN DISCUSSION

D. L. O. Mendis

134. Mr. Mendis thanked all the speakers for the comments that they had offered which made the discussion very interesting indeed. Referring to Mr. Kotagama's condemnation of expensive 'toys' Mr. Mendis said that we should not doubt our ability to lead the world in certain areas of development and that the development of indigenous pre-stressed concrete techniques in this country was something that every Ceylonese should be proud of. He thanked Mr. Kumarasuriyar for his interesting comments on the labour theory of value and all the other speakers for their contributions.

135. The author wished to thank Mr. M.C.E. Fernando for his valuable observations and dealt with them as follows:

The Rs. 4200 mil., on housing, construction and related infrastructure had been derived by the planners using a pragmatic approach based on previous achievements in this field: A 1963 survey of private investment by the Central Bank had revealed an investment on housing of Rs. 310.8 mil. Another survey by the same authority in 1966/67 had shown an investment of Rs. 328 mil. on housing which represented 27.2% of total gross domestic capital formation for 1966 which was Rs. 1195 mil. Of this investment on housing as much as 82.2% had been on private residential construction.

136. Construction output was also estimated each year by both the Department of Census and Statistics and the Central Bank using the so called "commodity flow approach" based on consumption of materials. On this basis estimates of investment were Rs. 346.4 mil. in 1967, Rs. 442.2 mil. in 1968 and Rs. 554.0 mil. in 1969 (It should be noted that devaluation of the rupee in November 1967 and introduction of the FEECs Scheme in May 1968 partly accounted for the annual increases).

Consumption of cement had been used as a check for consistency. The value for 1969 had been about Rs. 57 mil. which had agreed with the estimate for private housing construction for 1969.

137. On the other hand on the basis of meeting targets in housing, the following figures had been uncovered during preparation of the Plan. The estimated need for housing units each year during the plan period averaged 79,500. In order to catch up on the accummulated backlog, the annual provision would have to be more than 100,000 units. However, the actual performance in the recent past had been only about 25,000 units per year. To meet the recurrent need of 79,500 houses per year the investment needed would have to be Rs. 640 mil. per year; together with provision for repairs, renewals, extensions etc., the investment would be nearly Rs. 1000 mil. per annum.

138. Minimum United Nations targets for housing had been given as:

(a) 6% of gross national product

(b) 20% of gross fixed capital formation

(c) 10 units per 1000 persons by 1970 of which about 4 units would meet the population increase, 3 units would replace the slum units and 3 units would replace obsolescent units.

It had to be noted that the targets actually set out in the 5 Year Plan are lower than these minimum U.N. targets. The targets were as follows:

(Rs. mil)

	1972	1973	1974	1975	1976
Total construction out put	1,440	1,520	1,615	1,700	1,800
Private construction	864	912	696	1,020	1,080
Private housing construction	710	750	797	838	888

Investment in private housing — Rs. 3,983 m.
(say) — Rs. 4,000 m.
Investment in public housing — Rs. 200 m.

Total Rs. 4,200 m.

139. Mr. Fernando's comments were however quite valid because previous trends in private investment in housing may not be valid during the period of the 5 Year Plan on account of disincentives to investment such as the Rent Act. For this reason his suggestion to set up small building construction worker co-operatives in each development area was a valuable one which he had taken the opportunity to present to higher officials in the Ministry of Planning.

140. In regard to the unfavourable trade balance on account of decline in prices of exports and increase in prices of imports, he thought Mr. Fernando has really put his finger on a critical area of domination (to use Sagasti's idiom) of developed countries over poor countries like Sri Lanka. In fact, the failure of the recent 3rd UNCTAD in Santiago, Chile, was presumably due to realisation of this situation by the poor nations. and an awareness of this realisation by the rich nations.

141. However apart from "closing our borders" as the Hon'ble Kumarasuriar had said on an earlier occasion as the Socialist countries had done, he could not see a way out of this dilemma. He agreed with Mr. Fernando that a step in this direction could be "a positive commitment to an objective to move towards a closed economy". Such a commitment may be possible at a later stage when certain other steps such as land reforms,

had been taken. Meanwhile, we continued to increase our external debt to a point when we had to borrow money to pay the instalments on loans already taken. The next generation would probably have to take the decision to abrogate the bad debts of their fathers, and that may then become the ultimate solution.

142. Coming now to the reference to his quotation from Boorstein and the comparison with the State Engineering Corporation, he would like to reply here also to Mr. Rasiah's comments on the same subject. The research and development work in the State Engineering Corporation had been done not as an end in itself but as a necessary adjunct to the type of construction that they were engaged in. Hence, the money for this research and development work had been taken from the funds voted for construction. In his view, the prime justification for this was the savings in foreign exchange on the heavy construction contracts executed by the Corporation. Although he did not have the figures here it was a well established fact that the foreign exchange component of costs on SEC projects were always considerably lower than for any other contractor and this was a direct result of the R & D work done in the Corporation. The absence of business acumen which he had mentioned was aggravated by the rapid expansion of the Corporation. Nevertheless their contribution to development of indigenous technology, as well as the development of the country, was in the nature of a revolution in engineering, and the passing comparison with the Cuban situation was made with this thought in mind. Mr. Rasiah's simplistic view that the State Engineering Corporation was "by and large using imported technology perhaps somewhat modified to suit local conditions" did not in his opinion appreciate the contribution made by the SEC. He would leave it to posterity to judge whether Mr. Rasiah's view or his were the more correct.

143. Coming back to Mr. Fernando's observations, he thanked him for the quotation from Baker which described the smelting of iron in Kothmale area which had apparently been going on since the time of the ancient kings of Ceylon. There had also been a reference to the indigenous iron smelting industry in Ananda Coomaraswamy's classic "Medieval Sinhalese Art" which had also documented other references.

144. Within the last 100 years or so, indigenous rural technology had been suppressed by the commercialism of the imperialist rulers through the uncontrolled inflow of foreign technology. What he had been trying to say in his Paper was that the engineering profession in modern Sri Lanka should not be a party to continuing this suppression, but should join hands with the remaining rural technolgists (however few) and fight the modern imperialism of so called "Aid".

The following quotations from Coomaraswamy were relevant to this topic:

'In Ceylon, as in India, the direct and indirect influence of contact with the West has been fatal to the arts. The two most direct causes of this adverse influence have been the destruction of the organization of state-craftsmen, following upon the British occupation; and the subsequent systematic neglect, by British and Sinhalese alike, of a local architectural tradition. A less direct but equally sure and certain, cause of the decline of the arts has been the growth of commercialism, that system of production under which the work of European machines and machine-like men has in the East driven the village weaver from his loom,* the craftsman from his tools, the ploughman from his songs, and has divorced art from labour, In the words of Blake,

> "When nations grow old
> The arts grow cold,
> And commerce settles on every tree."

.....'The essential method of commercialism is to create a want in order to have the opportunity of profiting by the filling of it. Under the commercial system, it is no longer demand that regulates supply, but production that 'forces a market'. Machinery has enabled the capitalist to do this to the fullest extent. The promise of labour saving machinery was: a millenium for the worker, shorter hours and easier work; its results have been merely increased production, increased profit to the capitalist, and not less, but less intelligent, work for the producer. Not merely is the workman through division of labour no longer able to make any whole thing, not only is he confined to making small parts of things, but it is impossible for him to improve his position or to win reward for excellence in the creaft itself. Under guild conditions, it was possible and usual for the apprentice to rise through all grades of knowledge and experience to the position of a mastercraftsman. But take any such trade as carpet making under modern conditions, by power-looms. The operator has no longer to design or to weave in and out the threads with his own fingers. He is employed in reality, not as a carpet weaver, but as the tender of a machine. He may rise to a higher place it is true, but it is the place of a man responsible for the successful running of many machines by many men. He can never rise in virtue of his knowledge or experience in the craft itself. That craft is for him destroyed as a means of culture, and the community has lost one more man's intelligence, for it is obviously futile to attempt to build up by evening classes and free libraries, what the whole of a man's work is for ever breaking down. It is no longer possible for culture and refinement to come to the craftsman through his work; it must be won, if won at all, in spite of his work; he must seek them in a brief hour snatched from rest and sleep, at the expense of life itself. It is not strange that he does not seek them, nor that their expression is lacking in his work. He has not even the capacity for idling, but must continually seek amusement and excitement. There can be no quality of leisure in his work. In short, commercial production absolutely forbids a union of art with labour.'

.....'One of the most interesting and difficult distinctions that can be drawn is that between a tool and a machine. It is, however, one that the craftsman can always draw for himself, when he is free to do so. Thus the carpet loom is a tool, a contrivance for holding warp threads at a stretch, for the pile to be woven

*In euphemistic language; "successfully contested the village weaver's market".

round them by the craftsman's figures; but the power loom is a machine, for it does the essential part of the work, and in so doing imposes limitations on the spontaneity and freedom of the design and on the intelligence of the worker. The gouge and chisel are tools, but the mechanical carver is a machine, perhaps the most stupid yet invented. It is essential, then, for a re-union of art with labour, that machinery should be controlled; and this control can be properly exercised only by the craftsman himself. The place of machinery in a true civilisation will be that of a hewer of wood and drawer of water, a servant, not a master; its concern will be rather with the preparation than with the subsequent manipulation of materials. Its purpose will be, not to rob the craftsmen of that part of labour which is his very craft itself, but to save him from the heaviest and least interesting work, and to carry out only the simpler and most mechanical processes of manufacture.'

145. The author wished to thank Mr. S. Rajanayagam for his comments. He appeared to advocate the Gandhian approach to industrialisation which had its modern counterpart in the writings of Simone De Beauvoir who had said that "man is crushed by technology, alienated from his work, enslaved and brutalised". He himself prefered Coomaraswamy's cultural approach quoted above, tempered with the political wisdom of Che Guevara as illustrated by the following quotation:

"By 1964, however, Che had rediscovered his old commitment to the poor nations of the world, if he had ever lost it. He began to consider that the real contradiction was not between capitalism and communism, but between developed and underdeveloped countries. Disappointment with the terms exacted by Russia and Eastern Europe for their aid to Cuba turned Che towards the concept of a Third world, made up of the poor nations from three continents, Africa and Asia and Latin America. Two other worlds opposed this Third World, a Western world and an Eastern world. Both of these two worlds consisted of powerful blocs of developed countries with high standards of living, even if they claimed to be political foes. Underdevelopment and hunger drew a different geography than did capitalism and communism. The new line divided the haves from the have-nots, the manufacturers of goods from the suppliers of raw materials, the white-skinned peoples from the dark-skinned, the colonial powers from their old possessions. The line did not clearly divide one country from another in every case; but each drawing of the line defined more clearly a Third World set apart from a Western and an Eastern power bloc.

Che's concept of a Third World has captured the popular imagination as completely as the concepts of the Yellow Peril or Manifest Destiny did in their time. This concept has led to ways of thought, even to diplomatic groupings. And that was Che's intention, as he set it out in a speech to the United Nations' Conference on Trade and Development in March 1964. The poor nations must not squabble for loans from the rich nations. They must show solidarity.

'If the groups of underdeveloped countries, lured by the siron song of the vested interests of the developed powers which exploit their backwardness, contend futilely among themselves for the crumbs from the table of the world's mighty and break the ranks of numerically superior forces... the world will remain as it is.'

The poor nations had to learn not to undercut each other in the supplying of raw materials, nor to take bribes for joining either the Eastern or the Western bloc. Che was preaching almost the virtures of a labour union to the poor nations. In union lay strength and bargaining powers; a scab nation was a villain. And his words had particular meaning for those peoples who saw themselves as Frantz Fanon's "wretched of the earth" from the Third World, rather than as the 'wretched' hymned in the Internationale, the poor workers of the industrial nations.

146. Nevertheless, he was gratified that Mr. Rajanayagam had 20 years ago been able to see the disadvantages of foreign technical assistance and specifically stated that "the nationals of this country may come to a state when they will have hypnotised themselves into the belief that all such work requires foreign assistance".

147. In his opinion we *had* come to such a state a few years ago despite the courageous resistence offered by the SEC almost alone. The then Ministry of Planning and Economic Affairs had made no small contribution to this state of affairs. He had made several attempts to oppose this, as illustrated by the following quotations from a proposal entitled, "A Technical Division in the Ministry of Planning and Economic Affairs" dated 14th June 1970, later presented at a Seminar on Development Planning organised by this Institution in 1970:

"On account of the system of foreign financing known as 'Project Aid' together with the practice of depending on foreign Advisers for technical expertize, there has been unnecessary expenditure of foreign exchange on some projects. This happens for example when there is wholesae transfer of an advanced level of technology used successfully in a developed country, for implementing a local project, instead of maximizing utilization of locally available resources including technical know-how.

This tendency to borrow the technology of the "aid" giving country into has permeated from the Planning Ministry to some departments and Ministries as well. Instead of taking stock of whatever resources the department already has, a completely new list of plant and equipment is drawn up and sent to the Planning Ministry for approval against this or the other "line of credit" that may be available.

On projects that are financed by the World Bank, This situation becomes hopeless when the technical expertize of the Bank's advisers prevails over local opinion. Some of the projects financed by the World Bank, such as the Highways Projects and the Gas Turbine could as well have been formulated entirely in Washington D.C. by people who had never visited (or even heard of) this country, but were supplied with a few maps, plans, statistics etc. In the implementation of such projects there is a wholeasale transfer of foreign technology, so that new employment opportunities are often kept to a minimum.

The foreign technology that is so transplanted does not easily take root here as may sometimes be imagined. Ceylonese engineers know this. They also know that the vital need in our country today is to carefully and lovingly nurture the growth of indigenous technology in our own social, cultural economic and political environment. The rate of growth of this indigenous technology will determine the rate of achievement of economic independance.

The new Ministry of Planning and Employment is an appropriate vehicle for promoting this end. To achieve this, a Technical Division should be set up in this Ministry without delay."

148. Coming to Mr. C. Rasiah's comments he wished to thank him for his appreciation of the paper. It was with some reluctance that he had to correct the respected Secretary of the Institution when he said that he had quoted extensively from various foreign economists and experts implying that they were from the developed world. Although he had no qualms about quoting authorities from the developed world, when necessary, Fancisco Sagasti, as he had stated in the Paper, was very much a citizen of a poor and underdeveloped country like Sri Lanka, namely Peru, and was therefore an authority from the Third World. In the introductory remarks he had said that the reason he had quoted extensively from Sagasti was because he wrote with first hand experience of Latin America, and that in his opinion the condition of Latin America today may well be the condition of Sri Lanka tomorrow. Therefore, we should learn from the experiences of Latin American countries to prevent ourselves being foolishly exploited by the rich and powerful countries of the world today, and it was already rather late to start making a move in this direction.

149. Mr. Rasiah's comments on AID from Western and from Socialist countries were interesting. He saw a similarity to the reasoning of Guevara on this topic, quoted above, and he congratualated Mr. Rasiah for his vision on this.

He did agree with Mr. Rasiah that public corporations should be run efficiently without waste and misuse of public funds. But as far as the SEC was concerned its research and development was done without any funds being voted for this by the Government. This neglect of Engineering research contrasts with the case of Agricultural research for which there were Institutes like the RRI and TRI which were well funded. Even the CISIR had originally been provided with funds for research but later the notion that it should pay for itself by undertaking commercial jobs had been impressed on important people, and this was the beginning of the end as far as a proper contribution to industrial research from this Institute was concerned. Now we had the situation that NERD was struggling to be born apparently for similar short-sighted reasons.

150. Regarding the reference to the untying of aid as recommended in the Pearson's report, he had made the point that technical screening by the receiving country would effectively untie such packages which the donor countries had tied up and disguised as lines of credit. Therefore, he agreed completely that the fault was on our part and the remedy also should be in our hands. The tragedy was that we were not taking steps to remedy the situation effectively. Such ad hoc efforts as the one he had described to make the weighing machines locally were not enough. A scheme for technical screening was illustrated in the figure. (Page) This was a modification of a general scheme devised by Sagasti in his paper. In regard to brand names, this was part of the general problem of technology transfer about which the quotation from Sagasti was quite explicit.

151. In regard to the production of mammoties by the village blacksmiths he agreed with Mr. Rasiah that production on a large scale was not a matter of simple arithmetic, but he must assure him also that they had been very realistic in the in approach to the whole problem. At the Kothmale industrial co-operative they had a capacity for producing a maximum of about 6000 mammoties per month. But if they were to do this on this scale they would need a central heat treatment plant. They had made arrangements to set up such a plant and had taken steps to teach the blacksmiths the modern metallurgical approach to forging, with consultancy services from the Faculty of Engineering, Peradeniya and the Industrial Development Board's Technical Services Agencry, as well as from an eminent private consultant who prefered to remain anonymous.

They had been using scrap steel purchased at competitive prices from the Railway and the CTB which were the prime sources that generated scrap. Whether these institutions run at a loss because they sell scrap at these rates is a matter for debate but he might say that the so called Nadars also purchase scrap at these rates and resell them to the small scale sector. One reason for setting up the industrial co-operatives was to break through this system. (Incidentally the elimination of the middle man had been mentioned as one of the objectives of the 5 Year Plan quoted in the Paper). In regard to the capital-output ratio for production of mammoties, he had given the calculation in his Paper and the figure was 0.83. He admitted that he had omitted the cost of the mammoty handles.

152. He would request Mr. Rasiah to visit the Kothmale project and see for himself whether the claims made in his Paper were exaggerated. He thanked him for reading his Paper carefully and discovering the mistake when the word "rise" had been used instead of the word "fall". But he could not agree with Rasiah's conclusion that the 5 Year Plan would not achieve results because it had been carelessly prepared.

153. Regarding Mr. Subasinghe's comments, he wished to thank him for the information given about the State Hardware Corporation.

154. He was, surprised about his view that Kothmale was not a good pilot project and he could only say that Mr. Subasinghe had accompanied him on one casual visit to this project before coming to this sweeping conclusion. The anonymous engineer referred to earlier, had come to quite a different conclusion as a

result of a single visit, and immediately offered his valuable advice and services which were gratefully accepted. The results would be evident within six months, at which stage he would invite Mr. Subasinghe to visit Kothmale again.

155. He thanked Mr. Sarath Wijayapala for his comments. He agreed that there must be both material and moral incentives for a worker to increase his productivity, but he offered the view that in Sri Lanka, the dis-articulation of society into different layers that resisted the tendency (on the part of individuals) to merge one into the other, acts as a massive dis-incentive which doomed to failure any incentive scheme prepared for a particular 'layer' by another 'layer', or prepared by a layer for itself, but subject to approval by another layer. Hence, technologists being familiar with Work Study Methods did not result in increased productivity from skilled labour, for instance, to the extent expected. Nevertheless, he wished Mr. Wijayapala well in his practical efforts, in the future.

156. He was in complete agreement with Mr. Subasinghe's proposal to have an Institution-day discussion on NERD, and be would add that the Institution should invite the Hon. Minister of Industries to be present on this occasion, and explain to the members why NERD had not been set up yet.

157. He had to thank Dr. Balasuriya for his observations. His reply to the other members covered to a great extent what he would have said in reply to him also. He need add only that in his opinion what this country needed was a Policy for Technology which would ensure the achivement of self-reliance in reality and not in mere words, by eschewing any tendancy to indulge in slogan shouting and publicity hunting which was detrimental to the profession and the economy. He referred, of course, to the recent publicity given to "Pukka Sahib" technology and "Bas Unheya" technology at seminars and even in the daily press.

158. At the seminar on Development Planning in 1970 referred to earlier he had made this point in the following terms:

> "In any country which relies heavily upon Western technologies and their related institutions – and especially upon Western economics – there is a tendency to favour large, capital-intensive projects against small labour-intensive ones. In this respect the needs of rural development stand directly opposed to the trend of Western economic life; rural development calls for production by the masses, not for mass production .....
>
> A new approach to technology for development is therefore needed. The starting point of this would be an understanding that technology is not a given factor in development, to which all other economic and social circumstances must be adapted; but that it is perhaps the most variable, malleable factor of all, capable of being adapted to suit the economic social and cultural environment into which it is being introduced."

159. In short, there was a need for the statement of a policy for the development of indigenous technology, because indigenous technology would the cornerstone of economic independence. Such a policy would encourage the use of locally available materials and other resources, the creation of new skills by organized, systematic pre-job and on-the-job training at all levels, and the adoption of appropriate levels of technology to suit available skills and managerial competence.

160. A suggestion had therefore been made that a Technical Division should be set up in the Ministry of Planning and Employment to give a new orientation to project planning in particular and to economic planning in general. An alternative proposal had been suggested that all projects should be referred by the Planning Ministry to an independant panel of engineers for approval. Whatever the ultimate outcome, he wished to stress the importance of understanding the significance of the choice of technology in project planning. He would also commend the subject for further research by the engineering profession.

161. He agreed with Dr. Balasuriya that the genuine efforts and valuable contribution made by SEC under its former Chairman had been condemed in certain quarters and attempts made to ridicule these contributions. This was why he had stressed in his paper that we must guard against the danger of going back to undue dependance on foreign expertise as a result. On the other hand those who sincerely criticised the SEC perhaps believed that a simpler technological approach was more appropriate to Ceylon than some of the advanced technology that was being developed and used in SEC at the time. The important point in his opinion was that simple or advanced, the technology was indigenious with its roots in our soil because it was developed here. This was the ultimate meaning of the popular expression 'appropriate' technology which was now popular with economists having replaced the older expression 'intermediate' technology. He was informed that the most modern descriptive term was 'adaptive' technology. Whatever the expression used to describe the most suitable technology, we should not restrict ourselves either to the simple or to the complex but keep an open mind, think from first principles, use whatever knowledge was available,

harness the locally available resources first and supplement with foreign resources thereafter, and this was what added up to the correct technologly for us.

162. The Author thanked Mr. Justin Gunasekera for the considerable efforts he had taken to offer some written comments. In answer to this scholarly discourse, the author faced the choice of either answering the points raised according to paragraph, or of writing another paper in reply! The former appeared to be the more rational (if inadequate) course.

163. In para 89 Mr. Gunasekera said that the authors paper "was bound to create a certain amount of confusion (and possibly also surprise, disbelief, indignation etc.)", and in paragraph 90 the he said "the use of sophisticated clarifying adjectives such as "intermediate' (and also 'Pukka sahib' recently heard elsewhere) in place of the more simple language used in the Plan tends to add to the confusion".

164. The author could see that there had been some confusion semewhere, because the clarifying adjective 'intermediate', whether sophisticated or otherwise, had not been used anywhere in the paper! Again, in paragraph 91 Mr. Gunasekera said "in the context of strongly rejecting foreign technology, expertise and packaged aid as advocated in the lecture'... whereas in paragraph 102 he said "the author has not advocated the total rejection of such technological aid, but has welcomed the growing awareness of the need for better screening of foreign packaged aid in the future". Clearly "a certain amount of confusion" had occurred, but rather than respond with "surprise, disbelief, indignation, etc.". the author merely suggests that Mr. Gunasekera should go through his paper more carefully again.

165. In paragraph 94 Mr. Gunasekera asked that "the discussion be commenced with a clear conscience", and also that "our alleged heavy dependence on foreign expertise and technology in the past should be honestly and dispassionately examined". Thereafter he makes several comments under the heading "The Technologists role in the past", which should not pass unchallenged. In paragraph 96 he said that "the present enthusiasm for the development of indigeneous technologies is also of comparatively recent origin", and in paragraph 99 he said that "it was also quite recently that the State Engineering Corporation established a Research and Development Divison geared to its own special need. In fact such a step should be considered as part of the normal course of events in the progressive development of the largest Civil Engineering Construction organisation in the country".

166. He would ask Mr. Gunasekera in reply to take his mind back to the early 50's or late 40's when a Designs and Research Branch existed in the Irrigation Department to support construction work that was being undertaken by the Department on the Galoya Project as well as several medium scale projects in other parts of the island. The neglect of this branch in the late 50's and early 60's, and the subsequent departure of 4 Specialist officers from this branch to take up similar appointments as U.N. Experts in other parts of the world may also be quoted as resulting from a non-revolutionary attitude to development which could also be labelled as a hall-mark of under-development.

167. Again the author would like to refer Mr. Gunasekera to the Transactions of our own Institution of Engineers in 1967, where a plea for the development of indigenous technology was presented in the form of a case fo rconstruction of Samanalawewa head works using locally available resources "without lump sum foreign aid". Referring to paragraph 97 thea uthor would refer Mr. Gunasekera to Mr. Rajanayagam's comments where he had drawn attention to a statement made by him 20 years ago in 1952 about the danger of over-dependence on foreign expertise. In paragraph 98 Mr. Gunasekera reflects on the actual year "in which some foreign Economists began to advise the developing countries on the need for developing intermediate and indigenous technologies as the best means of overcoming their foreign exchange difficulties". Undoubtely Mr. Gunasekera is speaking of World Bank Economists and seems to be blissfully unware of the writings of Paul Baran, Edward Boorstein, Paul Sweezy, Harry Magdoff, Andre Gunder-Frank and others. He would commend these authors to Mr. Gunasekera for serious study.

168. In paragraph 100 Mr. Gunasekera comes out with a remarkable piece of "reasoning". He speaks of "timely importation of at least the very minimum requirement of weighing machines etc.," and "the decision to import mamoties etc.," as if the need for both weighing machines and mammoties were sprung on the authorities concerned so suddenly that there was no time to organise their manufacture in this country! Indeed one wonders how Mr. Gunasekera could talk glibly of the "recognition of the linkages between the Agricultural and Industrial sectors etc.," when all he apparently means is the Agricultural sector of Sri Lanka and the Industrial sector of Great Britain or some such developed country. It is this state of mind which could be described as characteristic of under development. To drive the point home further, he would like to relate what he had over heard a top bureaucrat in the Ministry of Agriculture tell a fellow official in the Ministry of Planning sometime ago. This official had said "We have saved some Rs. 40 million on the import of subsidiary food crops. I would like about Rs. 10 million of this saving to be released for the import of water pumps and other equipments." On hearing this the author had paraphased these words and put them in the mouth of a hypothetical bureacrat in the Ministry of Industries, thus: "We have saved Rs. 10 million on the import of water pumps: we would like to have about Rs. 1 million from this for the import of red onions and chillies for our workers!" As for the rest of paragraph 101 he would request Mr. Gunasekera to examine at least the Irrigation Projects in his own department over the past 20 years or more if he wanted information on "the identity and nature of project aid received in the past, the reasons for the superfluity or inappropriatness of the technology etc.".

169. In conclusion the author would like to stress that what all this meant was that there must be a National Policy for Technology which would be strictly followed by all technologists to promote the progressive development of indigenous technology in as many areas of application as possible.

170. Passing quickly over Mr. Gunasekera's comments on the Five Year Plan with only a passing comment that *every citizen* is involved in the dilemma facing the country

today so that the Technologist passing the buck to the Polition or the Economist meant nothing he would like to comment further on the Kothmale (Mammoties) Project. He thanked Mr. Gunasekera for his compliments to the originator of theproject, the Assistant Government Agent Kothmale. In regard to the observations on the decision to promote an island wide scheme, he hastened to correct some wrong impressions in Mr. Gunesekeras mind. These Blacksmiths whom he had said were intended to be organised into industrial co-operatives which could consist of *about* 50 Smithees, and *ultimately* would be provided with central heat treatment plant estimated to cost *about* Rs. 50,000, and with *at least* 10 such Industrial Co-operatives to be set up in the near future, were mostly existing blacksmiths. He had said in his paper that "the Industrial Development Board had compiled a directory of small scale Industries throughout the island from which the necessary information had been abstracted". With this information they had clearly been able to organise existing blacksmiths into Industrial Co-operatives on the lines of the successful Kothmale project in the following 23 divisions:

Divisions	*No. of Smithies*
1. Kothmale	56
2. Walapane	28
3. Meda Dumbara	32
4. Patha Dumbara	25
5. Dambulla	16
6. Galewela	24
7. Naula	15
8. Matale	16
9. Rattota	50
10. Pannala	30
11. Kuliyapitiya	14
12. Bingiriya	18
13. Mahawa	28
14. Mawatagama	32
15. Palagala	12
16. Rambawa (Rotawewa)	14
17. Hingurakgoda	24
18. Nittambuwa	28
19. Kalawana	30
20. Mawanella – Epalawa	20
21. Mawanella – Wattegama	8
22. Bossella	12
23. Elpitiya	24

This scheme was to his mind an excellent example of a Development Project. The resources available in this country, human and material, were being utilised to the maximum. Foreign Exchange that would otherwise be spent on import of the products manufactured by blacksmiths was being saved. Steady employment was provided. With the Advisory Technical Services organised by the Ministry of Planning through the Metallurgist of the Faculty of Engineering and other Consultants, the technology of the blacksmith would be progressively modernised. In these circumstances, detailed economic appraisal of the type described by the writer was an example of the inappropriatness of western economic criteria when applied to a developing country, as described by Schumacher, which he had quoted in his reply to Dr. Balasuriya's comment. In the circumatances Mr. Gunasekeras observation that "the technologists providing the consultancy services are yet working on a tentative basis and, therefore, only partially full-filling their role of translating the objectives of the plan into tangible form and assessing all possible consequences of their proposal with the accuracy and thoroughness expected of them" suggested to him that Mr. Gunesekera's emphasis was more on theprocedures of plan formulation and evaluation to a nice exactness, rather than on harnessing indigenous resources to achieve long delayed results as far as possible. Nevertheless, in Mr. Gunasekeras defence, he would admit that such elaborate evaluation procedures as he advocated were indeed necessary for projects which were to be financed by foreign agencies. Until recently these were the only projects that held the spotlight in this country and it was not surprising that Mr. Gunasekera's training and experience appeared to have been confined to this type of project. However, he wished to assert that in the near future the emphasis must certainly be on local projects of the Kothmale type if this country was to avert a situation of being mortgaged wholesale to foreign lending agencies.

171. Coming finally to Mr. Gunasekera's comments on the Varied Roles of Technologists and the General Statement of the Technologist's Roles, He was glad to find an area of agreement with Mr. Gunasekeras point of view. Infact he found that to some extent Mr. Gunasekera, Sagasti, the Hon. Prime Minister and he had been saying the same thing in different ways, namely that the development of indigenous technology was the only possible basis of economic independence. However, he disassociated himself from the last sentence of the writers comments where he refered to "our apparent technological capability at the present time as evidenced by a handfull of isolated and hitherto relatively insignificant achievements". This statement in his opinion was an expression of Mr. Gunasekeras one lack of awareness of the technological capabilities and achivements of the people of this country. He would therefore like to mention here that a Ceylonese Engineer was the inventor of one of the first commercially successful two wheeled tractors, a multi-purpose helicopter now under commercial production, and a 6 wheeled all purpose tractor-type vehicle to be brought into commercial production in the very near future; that a Ceylonse Engineer had made a considerable contribution to the development of the Wankel engine more than 10 years ago; and that an English Civil Servant writing in 1843 of Portuguese and Sinhalese Cabinet makers in Galle said that "they complained greatly of English tools as being very badly adapted to the hardness of ebony and satin wood timber. I would therefore suggest to the British Manufacturers to study the shape and temper of the native tools which are of the most simple construction and thereby ensure certain and profitable returns for their exports to the Ceylon markets." British Manufacturers have certainly made profitable returns from the Ceylon market ever since, thanks to the "under developed" attitudes of the Ceylonese themselves.

172. Mr. Gunasekeras Appendix on an "Introduction to Project Evaluation" deserved a separate comment after it has been studied and assimilated. He had to confess that he had not succeeded so far in absorbing all that material.