GOVERNMENT OF MADRAS

DEVELOPMENT DEPARTMENT

FINAL REPORT OF THE INDUSTRIAL PLANNING COMMITTEE

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INDUSTRIAL PLANNING COMMITTEE.

Chairman

Sri S. PARTHASARATHY, Madras.

Members

Sri P. S. KUMARASWAMI RAJA, M.L.A.

Sri R. SURYANARAYANA RAO, M.L.C.

Sri M. PALLAM RAJU, M.L.A.

Janab M. MOHAMAD ISMAIL, M.L.A.

Sri Rao Bahadur B. V. NARAYANASWAMI NAYUDU, Madras.

Sri B. S. SANJEEVA REDDI, Betamcherla, Kurnool district.

Mr. SAMUEL AARON, Pappinisseri, North Malabar.

Secretary

Sri C. J. VENKATARAMANA RAO, B.A.

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FINAL REPORT OF THE INDUSTRIAL PLANNING COMMITTEE.

CHAPTER I.

INTRODUCTORY.

Appointment of the Committee.—The Industrial Planning Committee was constituted by the Government in their Order Ms. No. 2303, Development, dated 26th May 1947, with the following members :—

Chairman.

1. Sri S. PARTHASARATHY, Madras.

Members.

2. Sri P. S. KUMARASWAMI RAJA, M.L.A.
3. Sri R. SURYANARAYANA RAO, M.L.C.
4. Sri M. PALLAM RAJU, M.L.A.
5. Janab M. MOHAMED ISMAIL, M.L.A.
6. Sri Rao Bahadur B. V. NARAYANASWAMI NAYUDU, Madras.
7. Sri B. S. SANJEEVI REDDI, Betamcherla, Kurnool district.
8. Mr. SAMUEL AARON, Pappinisseri, North Malabar.

Sri Rao Bahadur B. V. Narayanaswami Nayudu resigned his membership on 26th November 1947 consequent on his appointment as member, Indian Tariff Board.

2. *Terms of reference to the Committee.*—The functions of the Committee were defined as follows :—

(1) To draw up long-term and short-term plans for industrialization in this Province, having regard to—

(*a*) the essential character of the industries,

(*b*) the full utilization of raw materials available in this Province,

(*c*) the utilization of the by-products of existing industries, and

(*d*) the availability of power, transport and labour;

(2) To determine the nature and extent of Government assistance that should be given to such industries and in connexion therewith, to recommend the establishment of any authority, statutory or otherwise, that should be set up for giving such aid or assistance;

(3) To advise on the nature and extent of control which should be exercised by the Government over industries especially

those that have been given Government assistance and suggest which industries should be—

(*a*) State-owned,

(*b*) State-controlled, and

(*c*) Left to private enterprise;

(4) To report on the working of the State-Aid to Industries Act and recommend whether it should be amended, repealed or replaced by any new legislation;

(5) To advise whether or not any limitation should be imposed on the distribution of the profits of industries where the whole or part of their finance is contributed by the public;

(6) To report on the merits or otherwise of the existing systems of management of industries and recommend whether or not any provision should be made to control or alter the existing systems of managements;

(7) To advise on the question whether and to what extent labour should participate in the profits of industry and whether any conditions should be imposed on industries that may be started hereafter, in the interests of labour; and

(8) To advise whether it would be necessary for the Government to set up a co-ordinating authority to render effective assistance to promoters of industries.

3. The Committee held its first meeting on the 20th June 1947, when it entered upon its work. A questionnaire was prepared by the Committee (Appendix I). It was published in the leading newspapers and was also despatched to prominent industrialists and public men in the Province with a view to invite their opinions on the various problems before the Committee. The answers received from the public to the questionnaire have been analysed in Appendix II.

4. *The preliminary report.*—The Committee prepared a preliminary report and presented the same to the Government on the 9th August 1947. The preliminary report dealt with major questions of industrial policy. The preliminary report was printed and published by the Government and was made available to the press and to the public on the 13th September 1947. It elicited some comments from the public, which are summarized in Appendix VI. The Committee examined a number of persons representing various industries, some of the Heads of Departments of Government, representatives of the Chambers of Commerce and other persons generally interested in the industrial development of the Province. The names of the persons who were examined and the summary of the evidence given by them before the Committee will be found in Appendix III. The Committee wish to take this opportunity to express their thanks to the managements of the various industries for the facilities afforded to them to visit their factories and particularly to the Mysore Government whose guests they were when on tour in the Mysore State.

5. *Assistance to the Committee.*—Though the Committee was appointed on 26th May 1947, no provision for the appointment of separate staff to assist the Committee in its work was made until the 14th August 1947, when the Government sanctioned the appointment of one Superintendent, one upper division clerk and one stenotypist, to attend to the work of the Committee. Mr. A. S. Naik, I.C.S., who was Secretary to the Committee from the inception, was not relieved of his normal duties as Under Secretary to the Government in the Development Department until 26th September 1947. Further staff consisting of an Assistant Secretary, one lower division clerk and one peon was appointed on the 26th September and in the Government Orders creating these two appointments, the Government have stated that they expect the final report of the Committee to be made available before the 1st December 1947. Mr. A. S. Naik who was appointed as full-time Secretary on 26th September 1947 transferred his services to the Government of Bombay and relinquished the post of Secretary to the Committee on the 14th November 1947. Mr. Ramachandra Chetti, who was appointed Secretary to the Committee continued in that capacity until 23rd November 1947 when Mr. C. J. Venkataramana Rao was appointed Secretary to the Committee.

6. The collection of materials and information relating to the subjects before the Committee from the Development Department and other departments of the Government may be stated to synchronize with the appointment of the present Secretary. The Committee regret that it has not been possible for them to complete the report before 1st December 1947. The appointment of necessary staff at a much later date, the changes in the person of the Secretary and the non-availability of material and information till a very late date, all these, have prevented the Committee from completing its final report within the time originally contemplated.

7. The drafting of the final report was taken on hand by the Chairman of the Committee with the assistance of the Secretary and other members of the staff at Kodaikanal on the 21st December 1947, and was placed before the members of the Committee for discussion from 8th January 1948. The Committee wish to place on record their appreciation of the services of the Secretary, Mr. C. J. Venkataramana Rao. His familiarity with the subjects dealt with by the Committee and the remarkable expedition with which he was able to collect and analyse the voluminous mass of information required by the Committee have considerably lightened their work. The Committee also wish to record their appreciation of the services of the other members of the staff who offered enthusiastic co-operation in completing the final report.

NOTE.—Details regarding the number of meetings held by the Committee and the places visited are given in Appendices IV and V respectively.

CHAPTER II.

General Aspects of Industrial Policy.

8. We attempted a definition of industrial planning in our preliminary report; but we are afraid its purpose is still being misunderstood in some quarters. Industrial planning and industrial surveys are not identical things; nor are the problems of planning in India identical with those of western countries. In highly industrialized countries like those in Western Europe, the problem is how best to give a new orientation to the industrial frame work called for by drastic changes in political and economic conditions. Nobody seriously discusses planning in the United States of America where political and economic conditions have undergone no fundamental changes as a result of World War II. In India, we are faced with the dual problems of having to build up our industries to the level required by modern civilization and at the same time to plan our development in such a way that it would not conflict with our political and social conditions. We do not want our report, therefore, to be treated as an attempt at an industrial survey of our Province. Such a survey could only be undertaken by groups of experts in each field of industry and is an essential preliminary before any large schemes of industrial expansion can be put into effect. Even in the field of planning we have not attempted an exhaustive treatment of the subject. To the extent that it is desirable to plan our industrial development, planning should be a constant process. It would be foolish if a plan once made is sought to be adhered to strictly in spite of changing conditions.

9. We are of the opinion that the industrial development of our Province should proceed on the basis of certain broad assumptions. Firstly, that the economy of our Province depends primarily upon agriculture. The percentage of population engaged in agriculture is about 30 and that engaged in industry is 9. The pressure of population on the soil has been steadily increasing. In 1931 our population figure was 46·7 millions; in 1941 it was 49·3 millions and in 1947 it may be estimated as 52 millions. To support such a large population on the basis of self-sufficiency of food, it is essential that the main occupation of our people should be agriculture. By this statement, we do not want to create the impression that the development of industries will attract the agricultural worker to the detriment of food production. It must be remembered that a good portion of those classed as agricultural workers are in the disguise of agricultural employment. More people are engaged on a field than is essential for its efficient cultivation. Some eke out a miserable living on lands of submarginal fertility. The family of an agricultural worker share the meagre return from the land. No saving is effected by the workers which could be utilized for effecting improvements to the land to enhance its yield. The establishment of industries in agricultural areas will draw only the surplus workers whose earnings will supplement the income of

the family and enable improvements to be effected to the land. The limits to the development of our industries are not therefore determined by the insufficiency of free labour. The difficulties in the way of expansion of our industries arise from the non-availability of certain essential raw materials, lack of capital and the limited output of electrical and thermal power. With the limited scope for industrial development that is open to our Province priority should be given to industries which directly or indirectly assist our agricultural operations. We have, therefore, preferred production of fertilizers to steel in the event of sufficient energy being available. Similarly vegetable oil supplies should be reserved for food consumption instead of being used in soap or other industries. Manufacture of agricultural machinery should receive priority over industrial machinery. If, indeed, we should be fortunate enough to strike oil or coal in our Province, we can afford to include a wider range of industries for development. At present, our lignite deposit is the only ray of hope.

10. Secondly, one must not lose sight of the fact that industries cannot spring up unless conditions favourable for their establishment already exist in our Province. Cheap power and transport should first be available and we have therefore emphasized the need to develop them in the main body of the report. Again very few industries are self-sufficient even if the raw materials are available. The interdependence of industries is a phenomenon of modern industrial development. To give an example a vegetable ghee industry cannot come into existence unless an expeller factory had already been set up. It cannot market its products unless a factory is there to supply containers. In our Province an industrialist has to shoulder the responsibility not merely of manufacturing the main product but also the subsidiary materials and accessories. It calls for a larger investment than is essential and is bad economics for the industry. We have therefore suggested at various places in the report that the Government should take the responsibility in the first instance of providing certain facilities essential to industries and even to undertake the initial processing of raw materials. Until the requirements of a particular class of industry reach a certain size of demand, no private person will find it profitable to take up the manufacture or supply of subsidiary materials. It is in fact a vicious circle which can only be broken by Governmental initiative.

11. To talk of raising the standard of living of our people but not engaging ourselves in productive activities is a contrary state of affairs. The economy of our Province can only be solved by more production and more production. A high level of industrial production because of the higher unit value of the industrial product is capable of materially increasing our standard of life as compared to increased agricultural production. While we do not underrate the importance of unproductive schemes for the removal of social evils or for the amelioration of rural conditions, from an ethical point of

view, the expenditure on such schemes should not be allowed to cripple altogether the availability of our finances for industrial development. For, the same objects can be achieved by rapid industrial development. While increase in our industrial production can help to raise the standard of living on a permanent footing ameliorative schemes will call for recurring annual expenditure. We hope we are not wrong if we say that the standard of life of our lowest paid industrial worker is better than that of the wage-earning agricultural worker.

12. This takes us on to the question of determining as to what should be the standard of living of our people. It is immediately essential that we should have more food and clothing, better houses to live in, proper sanitational environment, educational and medical facilities within easy reach and a sufficiency of goods and services to enable us to live comfortably according to Indian social standards as influenced by modern science. Our third assumption has, therefore, been that there is no intention on our part that our industries should cater either to sophisticated tastes or to the requirements of the western pattern of life. We have, therefore, stressed more the need to develop industries connected with food, building trade, chemicals and pharmaceuticals rather than motor cars, rayon and plastics. None of us, we hope, wants to lead the life of the American citizen who " lives in a state of siege from dawn till bed-time. Nearly everything he sees, hears, tastes, touches and smells is an attempt to sell him something " and in whose cities " highways are lined with hooked rugs, clam stands, and shiny filling stations, the fairs, the pushcarts, the hardware windows, supermarkets, vending machines, night signs bloody with peon, jukeboxes, hamburger stands, ' open all night ', doorbell salesmen and mailbox attractions." (*Fortune*, November, 1947.)

13. We must not forget that Indian economy (though it is at a low level to-day) has withstood the ravages of war and famine throughout the ages. The conservation of our natural resources has been greatly responsible for it. Ours is not a virgin country like the United States rich in natural resources. Their economy is that of the prodigal and already signs of exhaustion of their natural wealth are beginning to appear. We should take a long-range view of our economy and conserve our reserves for future generations to come. If as some of our politicians would have it, we have to make ourselves self-sufficient in all essential products of modern civilization in the sense that we do not either export or import any article of commerce, we should start ' slaughter tapping ' our resources. Some of them may not outlast three or four decades of exploitation. We should therefore restrict the use of our natural resources for purposes which are strictly essential to our economy. We should plan on a nation-wide basis for the collection of all scrap, waste and discarded materials with a view to reuse them again so that we may draw less upon our reserves of raw materials. Another factor which we are apt to forget in our enthusiasm for industrial development is the potential of the consumer. Any industry to be able to

withstand trade depressions, should cater to the needs of the ' common man ' ; and it should be well within his means to buy its products. The term ' common man ' now much in vogue in public speaking has to be defined. We assume that our first step in economic progress will be to try and elevate the very poor to the level of the educated lower middle class. The industries which cater to the needs of this class alone should be considered essential in the first stage of our industrial development. Unless alongside of industrial development we also plan for the prosperity of the agriculturist and for the education of the masses, the quantum of demand by the consumer in our Province is likely to remain much at the same level as before and our new industries will find it hard to market their products.

14. In our industrial framework we would like to see a very large percentage of small industries to our total industries. The reasons should be fairly clear. Smaller industries can be located in rural areas. An industrial establishment will bring with it to the rural areas, better roads, cheaper and quicker transport, educational and medical facilities, a better market for agricultural goods, a consumer class with greater spending power and better sanitation and water-supply. Again smaller industries will make available a larger number of entrepreneurs, technicians and business managers. Smaller industries can adjust themselves more easily to variations in demand than a big industry. But the chief merit of the small industry is that it could be established as a co-operative enterprise (not necessarily limited to the type contemplated by the Co-operative Societies Act). We feel that the traditions of our Province are more suited to such enterprises than to capitalistic enterprises. They alone can survive in the long run the criticisms of the Socialist and Communist against our present industrial organization. We should model ourselves more closely on the lines of the industrial framework of the Scandinavian countries rather than that of the United States. We envisage an industrial framework in which groups of villages will promote small industries in their midst for the utilization of the local raw materials and also to supply their essential requirements of industrial goods. It will be possible to run smaller units than what are recommended under European economy by savings in transport, middlemen's profits and overheads. Two classes of such small industries are possible. One where the entire manufacturing operation is carried on inside the factory premises and another where there is a central factory supplying semi-processed material for further operations in the homes of the local people. The porcelain industry of Japan is one such example. Clay for moulding is furnished to local people, who turn it into shape with simple machinery at home, and it is then brought back to the factory for being fired and glazed. Hosiery, pencils, furniture etc., can be manufactured in this way. A combination of cottage plus factory production results in goods which can satisfy technical standards.

15. To-day there is a conflict of ideals in India. On the one hand there is vigorous propaganda that large-scale industrialization is harmful to our country and that we should go back to the rural economy of the pre-British days. On the other hand, prominent industrialists and scientists are all out to Americanize India. We must avoid the danger of our country falling between two stools. To our mind the essential problem is to balance our industrial and rural economy. We should try to fit our industries into our social and communal life without upsetting its equilibrium by giving rise to problems of unemployment, growth of slums, exploitation of the consumer by monopolies and pools and disturbances to peace.

16. The segregation of the industrial workers in labour colonies and the reservation of industrial areas have been responsible for many of the evils of modern industry. By reason of the segregation, the industrial worker lives like the Harijan outside the pale of normal life. He develops an attitude of mind which magnifies his problems out of all proportion to their value and place in the prevailing conditions of life. His obsession overshadows all considerations of larger national interest or even the interest of people poorer than himself. He is naturally an easy victim to any mischievous propaganda. Were the industrial worker to live in the midst of a complex society he would become as good a citizen as any other and can view problems of society and the nation from the community's view point instead of that of mere self-interest. There is no justification to-day to exclude the location of industries from residential areas. Modern factory technique has succeeded in minimizing noise by use of individual motors to each machine, in eliminating smoke by use of electricity, in ensuring a clean atmosphere by devices to extract dust and noxious fumes, in providing better ventilation and lighting and protection against inclemencies of weather by air-conditioning and by installing processes for making innnocuous effluents and discharges from the factory. From another point of view if we can afford to risk the health of the people who work inside the factory, why should we be so zealous about protecting those living outside the factory from minor discomforts. Establishment of industrial democracy as defined by us in our Preliminary Report and the growth of co-operative enterprises offer to our minds the only solution of labour unrest. We do not propose to deal at length with the labour problems in this report though it has been referred to us. Since the date of appointment of the Committee, the problem has become acute and is now being dealt with by both the Central and the Provincial Governments. The suggestions made in our Preliminary Report on this aspect of the matter have been the subject of discussion between the Committee and the representative of labour. The views of the Committee have been expressed in the Preliminary Report and further clarification can be sought in the deposition of the labour representative in Appendix XXI.

17. There has been criticism in a few places, that in our Preliminary Report we have circumscribed within narrow limits the industries which should be nationalized. We have also been criticised for advising against the retention of control over distribution as a normal activity of Government. Since our Preliminary Report was published the eminent Socialist Mr. M. R. Masani has in his latest pamphlet set up a plea for a mixed economy. Mahatma Gandhi has denounced control over distribution. We were not concerned in the Preliminary Report with laying down the political idealogy to be followed in respect of industrial development for all times. We in fact advocated a socialistic bias in the beginning. We were more concerned with quickening the pace of industrial development. From a practical point of view it was no use advocating wholesale nationalization of industries at this stage of our political development. We reached this conclusion on our fourth assumption that it is not desirable to vest complete economic control with the Government at this stage. Our people have yet to be awakened to a sense of the rights and responsibilities of citizenship. Prevalence of corruption, black-marketing and tax-evasion are indications that we have yet a long way to go. Our popular Government have been in power only for a short time and in addition to the normal responsibilities of administration, they have had to face the new problems and shoulder the new responsibilities of a free India.

18. If at this stage, we should attempt to make our Government a huge commercial organization not only do we stand the risk of a complete breakdown of our present economy, but we will be corrupting the source of power. At various places in our report we have said the Government should undertake this and that industry. It is not our intention that in every such case the Government should assume the management themselves. In fact we feel for reasons already stated that such a step should be avoided as far as possible. We have been much impressed by the successful working of industries in Mysore State. They may be classified under three heads, those in which the Government have only a ten per cent interest in the capital, those in which they own a majority of the capital and those which are completely owned by the Government such as the Bhadravathi Iron and Steel Works. More information on this point will be found in Appendix VIII. The broad features may be stated to consist in this. Any commercial undertaking by the Government even if exclusively owned by them is run on the model of a joint-stock company organization. There is a Board of Directors whose members are nominated by the Government instead of being elected by the shareholders. The nomination is not from the legislature but from the business community. Heads of the Departments of Industries or Development represent the Government on the Board. If the enterprise is owned jointly by the Government and the public the Government nominate one or two Directors but insist on their approving the appointment of the Chairman and Managing Director. No

managing agency system is permitted where Government is interested in the industry. As the industries depend for their successful working upon certain concessions from the Government the control may be said to be more moral than direct. We may follow the same system as it has stood the test of time. Perhaps one additional condition may be imposed namely that the payment of a dividend beyond a certain percentage would require the sanction of the Government. The Mysore system has the advantage of flexibility and ensures freedom of action on the part of those controlling an industry. We recommend the adoption of the Mysore system in connection with Government aided and Government owned industries with as few modifications as possible.

19. There is no justification to permit the managing agency system in industrial management. It owes its origin to the fact that in the early days when advantage was taken of the joint stock organization to start enterprises, the capital had to be furnished by a small group of capitalists. Capital for industries was then shy and public participation was very limited. It was natural therefore for the few capitalists to seek protection of their interests against outsiders in various ways. To-day the managing agents have little stake in the concerns under their management. The law does not require them to hold even a single share. Another unhealthy development has been to substitute the limited company with a nominal capital in place of firms as managing agents. Besides affording protection against any claim for mismanagement the limited company managing agency is capable of being sold. Managing agency system has become impersonal. No qualifications requiring financial resources or business experience or technical skill have been imposed on them. Whatever the merits of the managing agency system in the early days, they are to-day an undesirable feature of our industrial organizations and deserve to be abolished.

20. In the Chapter on Small Scale Industries we have traced the causes of their failure as mainly due to their inability to maintain the standard of quality prescribed for their products. At present certain agricultural products are graded and certified. We understand that our Government have a scheme to examine and certify Biological preparations, drugs and patent goods. What we would like to see is the formation of an institute for each trade which would consist of representatives of manufacturers, experts and consumers to test and certify to the quality of almost all manufactured goods which are offered for sale. It may be necessary to have a common industrial laboratory for this purpose. For instance electric motors, etc., should be subjected to test by taking representative samples. If they stand the test the manufacturer may be permitted to affix a plate stating that it has been approved by the Committee of Electrical Standards. It may be necessary for such Committees to visit the factories to scrutinize the processes adopted and in case of food and medical products also to satisfy themselves about the standard of cleanliness maintained. The cost of installing

the laboratory may be met by contributions from the manufacturers and from the Government. The running costs may be met by fees charged for testing.

21. Another serious drawback with our small industries is their faulty distributive organization. Considerable publicity is essential before an indigenous product can displace a well-known brand of foreign origin. The cost involved in publicizing is often beyond the resources of the small industrialist. We throw out this suggestion to those who are interested in developing our local industries. Departmental stores with branches all over the Province would be able to assist in the distribution of all local products. More than that they will be able to judge the size of the demand and the quality demanded by consumers. They can co-ordinate most successfully the consumers' requirements and the manufacturers' capacity. In fact, the manufacturers in other countries adjust their production according to the specification of the departmental stores who buy in bulk and sell them under their own trade name.

22. The execution of the plans for the development of the Madras Province must be co-ordinated with those of Mysore, Travancore and Cochin. These States are within economic distances of our centres of consumption. Unco-ordinated development of industries will result in over-production and unhealthy competition. This is especially true of industries the demands of whose production are largely anticipatory. For instance, if the Mysore State were to have a caustic soda factory their cost of production is likely to be higher than one of ours as the factory will have to be located far from the sources of raw materials. A reversal of this state of affairs is equally possible. When such a condition results from unco-ordinated development, the consumer will be made to pay for the cost of the uneconomic units. In the Chapter on Power, we have referred to the need for co-ordination. Since the political administrations of the States are likely in future to approximate to those of Indian Provinces, there should be no great difficulty in securing such co-operation. Our suggestions go even farther than this. The industries of South India should be located at such centres (whether within our Province or within the adjacent States) which afford the maximum economy and advantage for their production and distribution. If the Governments of the Province and the States consider the products of an industry essential in character they should establish it as an enterprise jointly owned by them irrespective of its location. It is not within the competence of the Committee to plan for such co-ordinated development. We, therefore, suggest that the Minister for Industries of our Province should summon a Conference of the Ministers or officials in charge of this portfolio in the States for the purpose of reaching common aims.

23. We dwelt at some length in our Preliminary Report on the question of distribution of powers between the Province and Centre in the matter of industrial development. Since then the swing

of influential opinion appears to be in favour of vesting control in the Centre. It is not a matter of serious moment where the control is, so long as industrial development of our Province proceeds on a satisfactory basis. If the step taken by the present Member for Industries to summon a Conference of Provincial Ministers for Industries and prominent industrialists is indicative of a deliberate move to consult Provincial interests, then it is a good augury. We cannot help noticing however that there is an undercurrent of dissatisfaction that the interests of the Madras Province in the industrial field are being overlooked at the Centre. We can say that this criticism is unjustified so far as allotment of new industries is concerned. But we cannot say that it is wholly unfounded in the matter of granting of permits, export quotas and exchange allocations, etc. It may be that our interests are not sufficiently represented by industrialists at the seat of the Central Government. Whatever be the reason, it is essential if people should think in terms of India as a whole that industrial development should not be lopsided. Madras among the major Provinces takes the last place in the industrial index of development. Here lack of certain natural resources may partly account for it—again the frugal policy during the British Administration leading to the Meston Award may be another reason. But no one can say that Madras lacks potentialities for considerable industrial development. It should be the aim of the Government at the Centre to see that as far as possible industrial development and the standard of living proceed on a uniform basis all over India. The location of some research institutions could at least have been assigned to the Madras Province. She is in a position to furnish talent of a high order for research work. In any event centres of research should be located at cool and quiet spots such as those afforded by the hill stations of South India. The atmosphere necessary for research does not exist in busy and noisy cities. More research has been done in Oxford than in Manchester.

24. In the beginning of World War II, the markets for many of our products like cotton, groundnut oil, linseed oil, tea, cardamom, cashewnuts, leather and shellac were all dominated by the export trade. The prices for our raw products were fixed either at Liverpool, London, New York, Amsterdam or Hamburg. The producer had perforce to sell the products at prices fixed by the export trade whether or not it was remunerative to him. The reason why the producer was not able to control prices even to a small extent was due to the fact that we depended entirely upon foreign consumption for the disposal of our raw products. To achieve an adjustment of prices fair to the producer it is necessary that there should be a sizable local demand for our raw products.

25. We have, therefore, confined our recommendations largely to industries utilizing our main products. After the present scarcity of supplies is over, we may still be obliged to export a part of our raw products. If the projected factories come into

existence we may also be in a position to export vegetable ghee, paints, cement and leather goods. Our Province has a large trade with the countries of the East, such as Burma, Siam, Malaya and Ceylon. We do not share in any large degree in the handling of the export trade. When we become more of an exporter of manufactured articles than of raw materials, it will be necessary to safeguard our interest by engaging ourselves in the export trade. We would suggest that a beginning may be made in this direction by our Government sponsoring trade delegations to some of these countries in order to explore the possibilities of inter-commerce.

26. The Committees appointed by the Government of India (called the Panel Committees) to report upon the development of the various industries have in a majority of cases made their reports. We have given in Appendix VII, a list of industries, on which their reports are available. As we have said in our Preliminary Report these Panel reports are valuable sources of information about the industries investigated. We have not thought it necessary in view of these reports being available, to extract much of the information about the various industries contained in them. We would suggest therefore that our recommendations regarding industries should be read by industrialists with the relative panel reports to get a complete picture of the industry.

27. The recommendations made in our preliminary report have unfortunately not elicited much of useful public comment. We are, however, glad to report that except in respect of a few matters they have found general acceptance with the South Indian Chamber of Commerce, the Madras Chamber of Commerce and the Andhra Chamber of Commerce. We do not see any reason to modify the recommendations made therein in the light of criticism received so far. We therefore reaffirm the recommendations made therein.

28. We have indicated in the body of the report industries which may be considered for short-term development and those which may be postponed to a later date. We wish to impress upon the Government that so far as our information goes, very little progress has been made by some of the industrialists to whom permission has been accorded to carry out their projects. As the difficulties of each promoter are likely to be peculiar and cannot be discussed on any general basis, we have not made any investigations regarding the delay in the execution of the sanctioned projects. We would, however, suggest that the Government should call upon the promoters of each industry individually to see how far they can help in the removal of those difficulties. If the Government should consider that they will not be in a position to assist any particular promoter, they should in the event of his being unable to establish the industry within a specified time cancel the permission accorded to him and reallot it to another. Otherwise, there is a danger of some of our new industries not being

in a position to materialize in the near future, which may yet block the way for development of that particular branch of industry according to the target fixed by the Government.

[*A dissentient note on the "Location of Industries" (see paragraph 16 above) by Sri R. Suryanarayana Rao, M.L.C. and Janab M. Mohamed Ismail, M.L.A. is printed at the end of this Report.*]

CHAPTER III.

POWER.

29. Professor Saha is reported to have stated that the standard of life in a country can be measured by the amount of power consumed in the country by its inhabitants. The following table shows the electrical energy index table of various countries and the Provinces in India :—

	* In millions of KWH.	Per capita consumption.		* In millions of KWH.	Per capita consumption.
France	12,640	301·67	India—*cont.*		
Germany	25,203	370 63	Bihar ..	52	1·44
Italy	13,563	315·35	Bombay	836	40·09
Norway	3,325	1,150·52	Central Provinces.	16	0·94
Sweden	5,096	812·76	Delhi	36	38·91
Switzerland ..	4,643	1,118·79	Madras	225	4·58
United Kingdom ..	20,761	454·39	North-Western Frontier Provinces	8	2·72
Canada	25,402	2,309·27	Orissa	1	0·12
United States of America	108,632	846·05	The Punjab ..	129	4·56
Japan	24,312	345·83	Sind	30	6·63
India—			United Provinces.	257	4·67
Ajmer-Merwara ..	2	2·96	States—		
Assam	3	0·26	Mysore	259	35·35
Baluchistan ..	2	3·36	Travancore ..	6	0·97
Bengal	554	9·19			

* Figures for countries other than India are for the year 1936, *vide* "International Transport and Communications", Oxford University Press Publication. Figures for India are for the year 1939 (*vide* Electrical Machinery and Equipment Panel Report.)

30. It will be seen from the above table that within India, in the per capita consumption of electricity Bombay ranks first, Mysore being second. The above tables do not take into account thermal energy. The production of thermal energy in some European and American countries will be disproportionately higher than in India. From the above figures, it will be true to say that even within India the rate of industrial progress can be measured by the amount of electricity consumed. Power consumed by industry is to a large extent utilized for mechanical and thermal energy and to a lesser extent for radiant and chemical energy. The advantages in the handling of electrical energy have led to its almost exclusive employment in industry for producing mechanical energy. Whatever may be the source of power, whether water,

coal or oil, its transformation into electrical energy is common before its use in industry as mechanical power. The requirement of thermal energy for industries is likely to be much greater in future than what it had been in the past. Chemical factories require thermal energy for producing processed steam. Brick, cement and some chemical industries require thermal energy for calcining. Electrical energy is never used as such except in electrolysis of salts. Radiant energy is required for industrial lighting. To-day the sources from which power can be derived are: water, coal and oil. To a small extent, wind and wood fuel can be used as sources of power. When we examine the sources of power in the Madras Province, we find that for coal and oil we are completely dependent on imports. The wood fuel to the extent that it is available, is used mainly for domestic purposes and it cannot be reckoned as a source of power for industrial purposes. Wind power has yet to be exploited in the Province. But even if we should popularize the use of wind motors they can be used only for lifting small quantities of water.

31. *Electrical systems in the Madras Province.*—The hydro-electric systems in the Province are—(1) Pykara, (2) Mettur and (3) Papanasam. The thermal stations are—(1) Madras, (2) Vizagapatam, (3) Bezwada, (4) Cocanada and (5) Kurnool. The power generated from all the sources including the licensees was 413·88 million units in 1945–46. The programme of hydro-electric generation for the five years ending 1951 includes the following :—

Name.	Output of power proposed to be developed.
1 Machkund Scheme	* 35,000 K.W.
2 Moyar Scheme	36,000 K.W.
3 Pykara Extensions	27,000 K.W.
4 Papanasam Extensions	7,250 K.W.
Total ..	105,250 K.W.

* Initially and 100,000 K.W. eventually.

32. The forecast of additional demand under the hydro-systems at the end of 1951 is estimated at 124,000 K.W. The available power forecast in the hydro area up to that year is also about the same. The programme assumes that normal conditions will prevail during the period. If weather conditions are not normal, power generation may be affected necessitating restrictions on the distribution of power. It will thus be clear that there will be no surplus power available either to make up any deficiency or for any large scale industries that may come into existence in the near future. In February 1946, owing to a fall in the water-level in the Mettur Dam, power was considerably restricted to the factories in Salem district, necessitating the closing down of some factories. It is probably in view of this that the Electricity Department contemplated investigating the following sites which are

reported to be promising for the development of hydro-electric power :—

Name of the site.	Continuous power to be developed.	Name of the site.	Continuous power to be developed.
1 Periyar ..	36,000 K.W.	8 Srisailam ..	6,600 K.W.
2 Mekadattu ..	9,400 K.W.	9 Sileru (Upper).	5,500 K.W.
3 Kumbar (Upper Palnis) ..	8,300 K.W.	10 Sileru (Lower).	6,200 K.W.
4 Kundah ..	8,000 K.W.	11 Chittipet canal-falls	1,100 K.W.
5 Upper Moyar ..	8,750 K.W.	12 Ramapadasagar.	64,000/88,000
6 Thalipuza ..	11,000 K.W.		
7 Thungabhadra.	6,900 K.W.		

When all the schemes in the above list are taken up, it is estimated that the economic hydro-power resources of the Province will be in the neighbourhood of 750,000 KW. at 60 per cent load factor. But nearly half of this is secondary power requiring some 125,000 K.W. of thermal electric plant if the entire resources are to be utilized as primary power. We understand that allowing for a normal industrial development including electrification of certain sections of railways, the hydro-power resources of the Province might be exhausted by 1970.

33. As things stand at present, the production of power is hardly sufficient to meet the demands of industry and other consumers. We feel that this state of affairs is not conducive to the orderly development of the industrial potential of the country. The normal rule should be that the generation of power should precede demand and there should always be available surplus power which can be made available almost immediately on demand. The capacity of the Madras thermal station being insufficient to meet the demand, rationing of power is still in force. Similarly in Calicut, Cannanore, British Cochin, Cuddapah, Hindupur, Mangalore and Rajahmundry, the generation plants were declared fully loaded and additional or new supply from these, however small, was prohibited during peak hours. The present precarious balance between demand and supply is most unsatisfactory. If power cannot be made available on demand, an industry has either to wait until power is made available or to instal its own plant for generation of power. No industry can afford to instal its own plant for generation of power for the interim period till public supply is made available as such a course will not merely entail heavy capital expenditure but consequential loss when the plant is scrapped. We shall take a possible situation to explain our point. A textile mill is in the process of being established in the Kurnool district but no power is available in the area Until power is made available in the area, the industry cannot start production though the factory may have been completely installed. The big cement plant which is proposed to be located in the Kurnool district for the supply of cement to the Thungabadra and the Ramapadasagar Projects will have to face the problem of securing power supplies. It is, therefore, necessary as we have said,

that generation of electricity must precede the consumption of electricity. A list of industries under several categories which have been sanctioned or which are under contemplation is given in Appendix IX. Those items which are noted with asterisks are at places where no electric-supply is available at present. As we have stated already, if these industries are to come into production in the normal course, it is essential that the responsibility for supplying them with electrical power should be undertaken by the Government. The power schemes which are being prospected may or may not be completed before the estimated dates. The Government have sanctioned industries without reference to the availability of power supplies. The industrialist has proceeded with the placing of order for machinery and erection of factories. We foresee a period of great trial for the projected industries unless the Government take a realistic view of the power position. Our suggestion is that immediate arrangements to instal a number of thermal units at such locations should be made. No objection on the question of cost between the proposed hydro-electric and thermal generation arises as it is admitted that there is no appreciable difference in cost between the two systems with the prevailing load factors.

So far as the new sites are concerned, we recommend that the following schemes should be taken up for immediate investigation :—

(1) Periyar, (2) Thalipuza, (3) Kundah, (4) Upper Moyar and (5) Srisailam. In selecting new sites, the Government should not consider the question of yield from any particular scheme so long as the total over-all yield on the entire electric schemes is satisfactory. A scheme if it fills a gap in our grid system or supplements power where there is scarcity is worth developing even if its yield be nil or slightly minus. The industries that spring up from extension of electric-supply will more than compensate the loss on the particular scheme.

The power capacity for certain plants are given below :—

1	Nellore	5,000 KW.
2	Madras Extension ..	15,000 KW.
3	Madura	4,000 KW initially and 8,000 KW addition.

34. We consider that the proposed capacity of the Nellore and Madras units is insufficient to meet the demand and that bigger units should be installed. The initial plant for Madura should have 12,000 KW. capacity instead of 4,000 as proposed. We consider that thermal generation of less than 8,000 KW. is uneconomic. We also advise the location of thermal stations as far as possible at ports to reduce the cost of transporting fuel. Such thermal stations can be fed by pipe-lines from the storage tank at quay side.

35. *Nursery power schemes—Nursery power stations for rural development.*—The ultimate aim of all the existing and projected plans is a power grid spread all over the country with its transmission and distribution net-works to supply cheap and abundant electrical energy. Power schemes to utilize fully the potentialities available in the country will take a considerably long period. Further, the supply from the power grid will not be economically feasible till adequate developments, rural and agricultural, have taken place and a load is built for it. We cannot altogether ignore the complaint made by licensees that extension to rural areas is unremunerative on the capital outlay involved. On the other hand our schemes for development of cottage industries will be accelerated if electric power is available in rural areas. We cannot afford to ignore the demand for electrical energy from our rural population and from our small cottage industries though it may be small in dimension and it will not be worthwhile to take lines from our grid. The power development schemes must, therefore, incorporate a phased programme which would help in the economic uplift of the rural population. We, therefore, suggest as an immediate and practical way of supplying power for this programme of rural development the establishment all over the countryside of small power stations using steam or oil prime movers. These " Nursery Power Stations " will help to build up demand for our large scale plants when they come into operation. Prime movers for these power stations can be graded in their capacities and standardized between 50 to 500 KW. Each nursery station would radiate power to cover a maximum radius of 10 to 12 miles distribution so designed and constructed as to readily merge into the ultimate grid network. It may be possible in a few cases to provide the required head of water for installation of water turbines without construction of long aqueducts and thus have small hydro-electric stations. The nursery power stations will run for a number of years and by the time they come near to closing down, they would have served their purpose and an useful period of life. It may be possible to group villages and maintain these small stations as co-operative units supervised by the Government. The prime mover and the electrical machinery manufacturing industries of the country would also have received a considerable impetus.

To sum up, nursery power stations will considerably help—

(1) rural and agricultural development including the development of cottage industries, and

(2) build up load gradually for the purpose of grid power supply.

36. *Grid.*—In order to develop the available power resources in an orderly and rational way and make same available over the entire Province, the Electricity department are proposing to build up an electrical network or " grid " covering the entire Province. The grid in the south is well-formed and is fed by the inter-connected hydro-electric power stations at Pykara, Mettur and Papanasam. In the central and northern regions of the Province, the grid is

yet to take shape. When Madras is linked with the Mettur Project and the Thungabadra and Machkund schemes are completed, the grid will practically cover the entire Province.

37. We have discussed at some length in the introductory chapter of our report that planning should be based upon a picture of the entire South Indian economy and not merely of that of Madras Province. It follows, therefore, that the development of electrical resources of the Madras Province must be co-ordinated with those of the adjacent States of Mysore, Travancore and Cochin, and at a later date with the systems of Orissa and Hyderabad. In a recent publication of the Royal Institute of International Affairs on International Road Transport, etc., the need for co-ordinated development of electrical resources between nations is stressed : " The growing need for power in connexion with the industrial development of many countries, the pressure to utilize water-power where coal is not readily available, the improvement in the technique of long-distance transmission of electric power and, laterly, its value as an export have all tended to expand the distribution of electric power from the national to the international field, in spite of nationalistic tendencies of the inter-war period." The desirability of such co-ordination has been admirably stated as having the object of achieving the best use of power over the whole area, e.g., by balancing sources of water power which reach their maximum in summer with those attaining their maximum in winter, by marrying the coal and water power-supplies to the best advantage, and possibly to some extent, by staggering the peak load as a result of the variation in time over a widely extended area. Already, the grid systems of the Madras Province have been connected at one point with the Travancore system at Tenkasi and with the Mysore system at Ujjain in the Bellary district. But it has been done without a realization of the full implication of such inter-connexion. The potentialities for generation of power of the States of Travancore, Cochin, Mysore and of the administered area of Coorg are given below :—

Name.	Total productive capacity.	Probable surplus.
Travancore	450,000 KW.	300,000 KW.
Cochin	150,000 KW.	80,000 KW.
Coorg	40,000 KW.	30,000 KW.
Mysore	300,000 KW.	Nil.

Except for Mysore which has already put into execution plans for the almost total exploitation of its water-resources, the other States have either not developed their resources at all or developed them only partially. It may be that unless the demand for power exists within their areas, they may not be interested in executing further schemes for development of power. On the other hand, if the Madras Government is in a position to assure them that they will be in a position to consume their surplus power, it may then be worth their while to develop their resources to the fullest extent.

Perhaps, financial assistance may have to be given to the States or the enterprise itself may have to be owned jointly by the Madras Government and the State concerned in definite shares. We are not looking at this aspect of the matter merely as a scheme to benefit the Madras Province. If the grid schemes of the Madras Province and the States were inter-connected, there might be a more economic and profitable use of power by seasonal exchange and it will serve to meet any emergency shut downs also. We have mentioned only one of the advantages to the States but we feel that if the matter were discussed by experts on either side they will be in a position to discover many other advantages accruing from a co-ordinated development of the electrical resources of South India. A map illustrating the Madras Grid is annexed.

38. *Distribution.*—We have extracted from the Electricity Department Hydro and Thermal Electric-power Tariffs (1946) samples of the tariff rates now prevailing in hydro-electric and thermal areas :—

		Rate per K.W.H.
		ANNAS.
High Tension.		
Hydro-electric—		
General purposes up to 25,000 units		0·55
Thermal—		
General purposes		0·75
Low Tension.		
Hydro-electric—		
Pykara :		
General purposes	First 120 units per month.	3·5
Do.	Next 180 do.	3·0
Mettur :		
General purposes	First 60 do.	4·0
Do.	Next 60 do.	3·5
Do.	Next 180 do.	3·0
Thermal—		
Bezwada :		
Lighting		5·0

A study of these rates shows differences not only between hydro-electric and thermal areas, but also between different hydro-electric systems. We have also made a comparison of the rates with those of other countries and of other systems in India. A graph illustrating the position is annexed. It shows that the rates charged by the Madras Government Electricity Department are by no means the lowest. We do not feel competent to discuss the question of rates in any great detail; but we maintain that the following principles must be borne in mind in fixing the tariff rates for electricity :—

(1) Subject to considerations involving load and diversity factors, the rates for the same class of consumer and for the same size of demand should be uniform throughout the Province.

(2) The tariff should provide for preferential rating varying with the purpose for which power is required. We would suggest that preference should be in the order given hereunder :—

(1) Agriculture; (2) Industries in which electricity is a major factor in the cost of production; (3) consumption by public authorities for sanitation or water-supply systems; (4) Cottage Industries; (5) Other Industries; (6) Private consumers.

39. One of the features of Hydro-electric generation in the Madras Province is the seasonal fluctuation in output in some of the schemes. For instance, in the Mettur Scheme, the minimum capacity is 17,000 KW and the maximum 40,000 KW. If the Tungabhadra and the Periyar Schemes are put into operation, they will also have minimum and maximum capacities. The problem created by this variation in capacity during seasons of the year can be met in two ways. One way would be to have some industry or other undertaking which would work only during the season of full capacity, and the other way would be to supplement the shortfall during the off-season by thermal energy through the grid. The problem of finding an industry or other undertaking which will consume power only during the full season is by no means easy. We have suggested at another place the installation of electrical furnaces which may be used to smelt the scrap during the season utilizing a larger quantity of electrical energy, the factory itself being engaged in rolling and other operations during the off-season. Another line of investigation which suggests itself to us is in connexion with the building industry. Sawing of timber and dressing of stone and marble by electrical machinery may be thought of. In fact, any industry which is engaged in building up a reserve of material for further operations or for other industries could be considered. The possibility of setting up seasonal phosphate furnaces in the Trichinopoly area may be examined. These industries can be supplied with power at very attractive rates as an inducement. Whether our suggestions are practicable or not we are anxious that until we have exhausted all possible means of utilization of the full season capacity, we should not think of keeping thermal stations only for the purpose of supplying deficiency during the off-season. Another factor about electrical consumption is the variation between the day and night loads. We do not have figures for these periods, but we are assured that at least under the Madras City Electricity system, there is a substantial diminution of demand between the hours of 11 p.m. and 6 a.m. We would suggest that in place of the existing tramway, a trolley bus service should be established in Madras which will have passenger carrying vehicles operating during the day and until 10 or 11 p.m. and vehicles for conservancy and transport of goods operating between 11 p.m. and 6 a.m. Most of the market produce has to be distributed to the suburban markets during the early hours of the morning. Fish has also to be transported quickly to the various markets. This can be done efficiently by a public service goods system or the trolley system. Another

suggestion that we make is the introduction of battery-operated vehicles for passenger carrying and transport between the City and the suburbs; and door to door delivery vehicles such as for conservancy and milk delivery in the City; the batteries of these vehicles receiving their charges at non-peak periods. We have only given a few of the ideas that we consider worth investigating in dealing with the problem of fluctuating demands. In addition to these, the popularization of low lift pumps for draining excess water from the fields while improving our agricultural methods will also account for some intake of power during the full season. Another solution is to offer more attractive tariff to consumers for night loads or off-peak hours to be ascertained by double tariff meters. This may induce bakeries, laundries and some of the smaller industries to draw their power supplies during nights.

(*Note.*—The memoranda forwarded by the Chief Engineer for Electricity and the Consulting Engineer to the Government are printed as Appendices X and XI.)

40. The other sources of power are briefly indicated below :—

(1) *Coal.*—No coal deposits worth mentioning are available in this Province, except the lignite deposits in the South Arcot district. The possibilities of utilizing these deposits for power production have been indicated elsewhere.

(2) *Wind Power.*—A windmill is not a steady source of power. However, small windmills may be useful on agricultural farms for the working of pumps for water lifting. These wind mills are employed for drainage purposes in Norway and Holland. In America, they are used to pump water at railway stations. Many of the farms in the United States of America have a windmill for lifting water for men and cattle and to provide electric power to light the farm. Windmills are also used for mining purposes as well as to charge electrical accumulators. A careful wind survey to locate the principal wind belts is a necessary pre-requisite and we suggest that such a survey may be undertaken. Research is also necessary on the most suitable type of windmills which can be installed in this Province.

41. *Power Board.*—The Government of India have introduced a Bill in the Dominion Legislature for the establishment of a statutory power board providing for the rationalization of the production and supply of electricity and generally for taking measures conducive to the electrical development of India. It empowers the Provincial Government to set up Provincial Boards for the administration of all matters connected with electricity generation, transmission and distribution. So far as this Province is concerned, the entire power production is controlled by the Government, and we do not therefore see any need for the constitution of such a Board for this Province. We, however, consider that a Power Board should be constituted at high level for this Province consisting of the Head of the Department of Electricity, the Directors of Industry and Agriculture, the Ministers for

Industries, Public Works and Finance. The Power Board should be entrusted with the decision in all matters of development of electricity, tariffs and sanctioning of supply to large consumers at special rates.

42. In regard to our recommendation for co-ordination between the Provinces and the States, we suggest the convening of a Conference by the Madras Government where the Ministers and officials in charge of the Electrical Department in each State can meet our Ministers and officials, with a view to arriving at a common and agreed decision regarding these matters.

[*A note on "Power" by Sri R. Suryanarayana Rao, M.L.C., and Janab M. Mohamed Ismail Sahib, M.L.A. is printed at the end of this Report.*]

CHAPTER IV.

TRANSPORT.

43. It is not for us to emphasise the importance of transport from the economic, military and administrative points of view. The dislocation to the Railway Transport system was caused by the removal of engines and wagons to the theatres of war and by non-replacement of worn-out and defective components during the war period. The railway system has had another shock on account of the partition of India, and it still remains dislocated. The coastal navigation lines also suffered depletion of tonnage during the war period. Motor Road Transport became very much curtailed owing to shortage of petrol and vehicles. Even bullock cart transport was affected on account of the mounting cost of animals and animal fodder and acute shortage of axles and tyres. "Transport bottle-neck" became a favourite expression in the country with administrators and industrialists to explain away many things. Though three years have elapsed since the cessation of war, we have not yet got over the transport bottleneck. Transport represents the arteries of industries carrying, as it does, their finished products to the distributive centres and also bringing in the raw materials for manufacture.

44. We are here concerned with transport only in relation to industry. If we do not refer to the steps that are being taken to remedy its defects and to expand it, it must not be assumed that we are unaware of them. To serve industry efficiently, transport must be proximate, cheap, speedy and reliable. We propose to examine our transport systems applying the above tests under the following heads :—

(1) Railways.
(2) Roads.
(3) Waterways—
  (*a*) Inland.
  (*b*) Marine.
(4) Air.

45. The Madras Province is served by three railway systems, the Bengal-Nagpur, the Madras and Southern Mahratta and the South Indian Railways. The route mileage is about 4,500 miles for an area of 126,166 square miles, and this works out to 0·035 mileage of railways for every square mile of area. We give below a few examples from European countries for comparative study :—

Country.	Area in square miles.	Total length of railway route in miles.	Route ileage per square mile.
1 France	212,659	26,427	0·124
2 Japan	175,521	15,254	0·087
3 United States of America	3,735,223	246,739	0·066

46. Madras Province (along with rest of India, of course) has a very poor density of railway network and to this extent its industrial progress must suffer. It is not possible to increase the route mileage as a short term programme and while we have therefore to seek alternative transport, we should also try to get the maximum benefit out of our railway system. The Russian example furnishes us with a useful study.

	1913.	1938.
Length of route miles	36,000	55,000
Number of locomotives	20,000	25,000
Number of freight cars	500,000	650,000
Tonnage of freight carried (millions) ..	132	516
Net ton mileage of freight traffic (millions)	40,900	230,700
Number of passengers carried (millions).	184	1,177

For an increase of less than 50 per cent in route mileage, 30 per cent in freight cars and 25 per cent in locomotives, the Soviet Railway System has been able to increase its volume of freight and the number of passengers carried more than six times. This we are told, has been achieved by use of better locomotives, better wagons and fuller use of the track.

47. It will hardly be controverted if we say that our rates on freight traffic are among the highest. The complaint of industry against railway rates has been long and persistent. It is enough if we give a sample of freight rate charged by the Indian Railway System as compared to the Canadian Railway System—

Commodity.	Station.	Distance. MILES.	Rate per ton.
Alumina ..	Muri Junction to Alwaye..	1,475	33·6 Canadian dollars.
Do. ..	Muri Junction to Calcutta.	213	5·7 ,,
Do. ..	East St. Louis to Arvida Que.	1,376	10·75 ,,
Do. ..	Arvida Que to Shawinigam falls.	214	2·5 ,,

The question of freight rates is a matter which requires immediate investigation and revision if the Government of India are serious about implementing their industrial policy.

48. Applying the test of speed, it is notorious that goods traffic in the Indian Railways are subject to inordinate delays. It is not an uncommon thing for a wagon to take two months to arrive, say, from Amritsar to Madras.

49. If we apply the test of safety, it is again common knowledge that consignments often get lost or pilfered on the way.

50. We suggest that the Railways should take up the following matters at least as a short range programme :—

(1) Provision for adequate warehouses at all important stations where merchandise can be stored in safety and without exposure to weather. This can be achieved by promoting a public warehousing company, who will build and own warehouses at stations and will for a charge take delivery of goods from the railway and store them until such time as the customer takes delivery.

(2) There are very few special type wagons in our railways. Modern industry is being furnished with special types of wagons in the United States. For instance, oil from an expeller factory can be transported in bulk in special tank wagons to the oil processing or soap factory instead of being sent in drums. Loss resulting from leakage from drums and freight on the return of empties are unnecessary items of cost borne by the industry. Similarly, if there were a fertilizer factory consuming daily a large quantity of sulphuric acid, it should be possibe to arrange for special type tank wagons to carry it. Refrigeration cars for the vegetable and fish trade are also wanting. Their use will help to conserve our meagre supplies of food.

(3) A serious defect of the railway system in our Province is the adoption of two different gauges on our main routes. The unloading and loading operations that became necessary whenever goods have to be transported across both the systems often results in damage to goods. We understand that in the United States, they adopt a system using a boxed type of wagon body which could be lifted by means of cranes from the chassis by operating a releasing device and placed on another chassis.

(4) Another matter which requires immediate attention is the extension and improvement to marshalling yards wherever there is congestion. These are matters of course for the Central Government, and we have mentioned them so that our Government and our industrialists may make representations to the Central Government.

51. *Road Transport.*—We have been able to make substantial progress in our Province in the matter of Road Transport. The T.V.S. groups of companies and the Rama Vilas Service operate a fast goods service between several important centres in the

Province. They have earned a reputation for reliability, speed and efficiency. Any nationalization of these services, if decided upon, should not fail to utilize their experience and talent and it should be the aim of the Government to maintain and improve upon the standards achieved. Road Transport freight on motor vehicles is, however, subject to limitations of cost and supplies of liquid fuel. They can only serve industry where speed and not cost is the material factor. In our opinion, they are not capable of any great expansion and cannot be expected to serve the needs of industry adequately.

52. Our traditional transport has been the animal-drawn vehicle. If statistics could be taken of the tonnage carried by these vehicles, we feel it will be an eye-opener to many. During World War II, the burden of our internal transport was borne in a large measure by these vehicles. Where speed is not essential and distances are short, bullock-drawn vehicles will still continue to play an important role in our transport system. Our idea of modernization should not lead us to neglect this class of transport. On the other hand, we must take on hand immediately measures to improve this transport. Pneumatic-tyred and sprung vehicles for animal draught should be manufactured largely in our Province. They should be sold to our present cart-owners on hire-purchase by the Government or through local co-operative societies with the idea that they should ultimately replace the old type of cart entirely. Only standard type-designs of such carts should be allowed to be manufactured and if the manufacture is given to private hands, care should be taken that no unreasonable profit is made by the manufacturer. The advantages of such pneumatic-tyred vehicles have been now proved beyond controversy. Any prejudice that exists against them is without foundation.

53. The Madras Government have a programme of road development contemplating the improvement of existing roads or construction of new roads to a length of 21,500 miles to the standard of National Highways. Another 35,000 miles are to be brought up to the standards of 'Other Districts Roads and Village Roads'. It is also in the programme that every village of over 500 population should be connected with the main roadways by well-formed roads. We do not know what progress has been achieved in this direction. We feel that we should stress the urgency of taking up this work on hand.

Note :—

National Highways.—These are main highways running through the length and breadth of India connecting ports, foreign highways, capitals of Provinces and large States and including roads required for strategic movements for the defence of India.

Provincial highways.—These refer to all other main trunk or other arterial roads of a Province or State connecting up with the National Highways or highways of adjacent provinces, district headquarters and important cities within the Province and serving as main arteries of traffic to and from district roads.

District roads.—These refer to roads traversing each district serving areas of production and markets and connecting these with each other and connecting highways or railways.

Village roads are roads connecting villages or groups of villages with each of them and to the nearest district road or main highway.

54. *Inland waterways.*—Inland waterways, if properly developed and maintained, would become as important a system of transport as railways over medium distances. In the western districts of Southern India, the inland waterways play a very important part in the transport of goods from the ports to the interior and between stations in the interior. Their service is cheaper, and more frequent and they depend little on the use of coal and fuel oils. They are largely used in the States of Travancore and Cochin, and to a small extent in the districts of Malabar and South Kanara. We understand that the Government have under consideration the question of developing the canal system further into the backwater areas of the South Kanara district. On the eastern half of our Province, the inland waterways such as exist are not being availed of to any appreciable extent for the transport of goods. Before we examine the causes of such non-use, we would like to give a short description of the canal systems on the East Coast. The important inland waterways are—

(1) The Godavari Canal System.
(2) The Kistna Delta Canal System.
(3) The Buckingham Canal.
(4) The Kurnool-Cuddapah Canal.
(5) The Vedaranyam Canal.

The navigability of these canals and the present use, that is made of them will be found in the Government Publication "Inland Waterways in the Madras Presidency." The Godavari, Kistna and the Buckingham Canals are linked together. The Kurnool-Cuddapah Canal is not at present interconnected with any of the canal systems. Though this canal is nearly 190 miles in length, and it was originally designed for navigation throughout, only a portion up to a length of 73 miles is at present navigable. We also find there is no interconnexion between the Buckingham and the Vedaranyam Canal Systems. Except for the Godavari and the Kistna Systems, no attempt has been subsequently made in any irrigation scheme to make provision for the use of irrigation canals as a means of transport also. The existing canal systems as at present maintained are not in a position to handle freight traffic of any considerable volume. They are often in a state of disrepair and no provision for wharves and storage facilities at canal banks and at convenient points has been made. In our view, the canal systems on the east coast should not only be interconnected, but also the possibility of connecting them with the canal systems on the west coast should be investigated. For the movement of crude

bulky materials such as ores, building materials, timber, etc., the canals would serve admirably well. For transport of agricultural produce, they could be of immense service. We even make bold to say that without the development of our inland waterways, it will not be possible for us to solve the problem of cheap transport in the Province. We, therefore, recommend that the Government of Madras should indent for the services of canal experts either from Holland or Germany to make a study of canal systems and report on the ways and means of making them serve not merely the purpose of industry, but general trade as well.

55. *Marine.*—The Madras Province compared to other Provinces possesses a longer coast line relative to its area. Even before the Christian era Southern India was among the foremost countries of the world as a seafaring nation. It carried on trade regularly with Greece and Egypt on the west and with China and East Indies on the east. Subsequently our inability to adapt ourselves to modern transport coupled with the competition from British shipping interests was responsible for our annihilation as a maritime nation in the world. Nevertheless our people have not lost the seafaring habit and even to-day they continue to navigate the sea in crude country crafts. During the period of the World War when steamer transport was not available, the country craft again became prominent and played an important part in transporting goods not merely between Indian ports but also between the Indian ports and the Middle East. With the cessation of War, the country craft service has again receded into the background. One main reason for this decline is due to the fact that the country craft is not considered a reliable means of transport both on account of its poor equipment and also due to the doubtful integrity of the tindals in charge of the craft. With a view to remove these drawbacks and to make the country craft service attractive for the transport of goods, it would be necessary to organize a fleet of these vessels under proper authority—preferably through co-operative organizations.

56. While making these suggestions, it is not our intention that our maritime traffic should be handled by country crafts to the exclusion of steamship. As regards the importance of sea transport we cannot do better than to quote the words of Sir Osborne Mance : " Without the ship, world trade, and indeed civilization, as we understand it, could not be sustained. It is largely to the ship that colonial empires owe their foundation and development. Ships again have helped small countries to become the world's greatest traders and to support a dense industrial population. The power of ships in wartime has changed the course of history. In two world wars the merchant marine has ranked equal to importance with the army, navy and air force."

57. We may classify the requirements of our sea transport as follows :—

(1) Freighters of 7,000 tons and over.

(2) Special vessels like tankers, colliers, bulk cargo vessels like grain vessels, vessels fitted with refrigerating machinery, fishing trawlers, etc.

(3) Intermediate cargo vessels of 2,000 to 3,000 tons.

(4) Barges, sailing ships fitted with auxiliary engines and country craft, etc.

At present there is only one national concern operating on the coastal traffic but all the vessels are of 7,000 tons and over. What we would suggest is that the Government of Madras should have a fleet of lighter craft belonging to the third and fourth classes to operate the entire coast length of the Madras Province and also between other ports in India. Sailing vessels with auxiliary engines, depending as they do less on imported fuel, will be able to provide a very cheap method of transport between the various points on the east and west coasts though the duration of the voyage may be slightly longer.

58. This will mean that our minor ports of which we have a large number will again become active centres of commerce and provide sufficient justification to undertake the schemes already in existence for the development of these minor ports. For example, Cocanada, Masulipatam, Cuddalore, Negapatam, Tuticorin, Calicut and Mangalore where steamers now rarely call can be opened for lighter craft and small steamers and sailing vessels. Besides, there are 47 sub-ports in the Province which can be made conveniently accessible to lighter vessels.

59. We are of the opinion that so far as sea transport is concerned no monopoly of any kind should be allowed to be created. If sea transport should be handled by private enterprise competition is essential to make it cheap and efficient and legislation should be undertaken to prevent the formation of pools and rate tariffs between shipping companies. It is with this idea in the background that we have suggested that the Government of Madras should establish their own line of lighter craft. If for any reason the Government do not see their way to accept this suggestion care should be taken to see that sea traffic is handled on a competitive basis and not on a monopolistic basis.

60. *Air.*—After World War II aircraft has come into use. It is used for passenger and light freight traffic. We expect in course of time a regular aircraft freight traffic will be established in India. It will be useful in course of time to carry bullion, drugs, etc. Except one airway company which has not yet come into operation there is at present no South Indian company engaged in this business. The Government of Madras should encourage the starting of aircraft service to serve the interior and other regions where the nationals of this Province are largely settled such as Burma, Malaya, Ceylon, etc.

Note.—A map illustrating the railway and canal systems and the major and minor ports is annexed.

CHAPTER V.

LIGNITE.

61. Deposits of lignite, popularly known as brown coal, were known some years ago to occur in the Vriddhachalam and Cuddalore taluks of the South Arcot district. A serious attempt to investigate the extent of the lignite beds was made in 1943, when the Government of Madras asked the Geological Survey Department of the Government of India to undertake this work. We understand that the Geological Department have just completed their investigations. The results of investigations carried out so far prove the existence of lignite over an area of 23 square miles below an over-burden of between 150 to 250 feet, the thickness of the seam averaging to 24·7 feet. The reserves of lignite are estimated to be about 498 million tons. Specimens of this lignite have been analysed and they are reported to be of good quality having calorific values averaging over 9,000 B.Th.U. Its phosphorus and sulphur contents do not exceed the percentages which would not affect its value. Though the investigations have been done in some detail, we do not think that they are in any sense complete. A definite stage in the investigation may be said to have been reached. We consider that the more important stage of the investigation remains yet to be done, namely, the investigation of suitable methods for the economic exploitation and utilization of the mineral found in the area. That would require the employment of foreign experts. We understand that the mining of the lignite deposits would present considerable difficulties owing to the artesian water-course running alongside of the lignite deposits. Considering the technical difficulties that present themselves and the inexperience of our experts in this class of work, we would recommend that the Government of Madras should seek the advice of foreign experts for the successful and economic working of the lignite beds. As far as we are aware, lignite deposits are being successfully extracted either by underground mining or by open-cut quarry method in Germany, Poland and the United States of America. We are not aware that Australia has made considerable researches in this line. We would suggest that some of the best technical personnel with experience in lignite in these countries should be invited to advise on the South Arcot Lignite. The Government of India are arranging to secure the services of some engineers and technical experts from Germany to assist in industrial research in India. We would suggest that the Government of India should be requested to find the expert personnel also for this purpose. (The latest method of underground gasification of coal which has been developed successfully in Russia may be capable of successful application to lignite.)

62. As regards the possible uses to which the South Arcot Lignite can be put, unfortunately much speculation is being indulged in at this stage. For instance, we are informed that the Madras Government contemplate using the lignite to provide coke for the

manufacture of steel in conjunction with the iron ore deposits of the Salem district. We consider that the uses to which the South Arcot Lignite could be put to economically without at the same time sacrificing its valuable bye-products are matters to be investigated by qualified experts and not by laymen. It is just possible that, if experts are employed for the purpose, they may be in a position to advise whether it would be possible to manufacture liquid fuel or to generate electricity at the pits head or both and also to advise on the distillation of the various bye-products (such as ammonium sulphate) formed in the process of gasification.

63. It is premature in our opinion to talk of using lignite for making it into briquetes for use in railway boilers or for conversion into coke for smelting iron. Now that the investigation of the lignite ore, so far as local experts are concerned, is nearly completed, it is essential that the Government should take early steps to secure the services of qualified experts who, we believe, will be found either in Germany or the United States of America to undertake a detailed investigation of the deposits and the processes to be adopted for their economic utilization.

64. One thing seems to be certain and that is, that the lignite deposits can be used for the generation of electricity on a very large scale and as fuel for industrial thermal energy. As we are deficient in electrical power and in fuel, we strongly advise that the mining and utilization of this deposit should be undertaken forthwith. For this purpose we suggest that a Mining Engineer, an Electrical Engineer and an Industrial Chemist should proceed immediately to England, the United States of America and Germany to study and report upon the methods adopted in those countries in the mining and utilization of lignite and to contact experts and firms who are capable of advising and undertaking investigation and fabrication of the necessary works and machinery for the purpose.

65. Alternately, we would suggest that the foreign experts might be called in first to investigate these problems in conjunction with our local experts who might later be deputed to England, the United States of America and Germany to gain first-hand experience in the handling of this project and to advise the foreign experts on local conditions in India.

CHAPTER VI.

Forest and forest produce.

66. The total forest area in this Province consists of about 15,406 square miles under Government control, about 3,000 square miles under panchayat management and about 3,300 square miles under private ownership (zamindaris) making a total of 21,700 square miles of forest area. This constitutes only 17 per cent of the total area of the Province, which is below the minimum percentage considered by the Government of India as essential for

the proper development of a tropical country. Even as it is, what is considered as forest reserves should not necessarily be taken to mean that the entire area is fully wooded. A good portion consists of scrub jungle and pasture lands. Thickly wooded forests are to be found mostly on the Western Ghats, and to some extent in the Agency tracts and Kurnool district.

67. It should be the fundamental policy of the Government to improve the quality and extent of the forests. With the abolition of zamindaris, private forests must come under Government management. Every effort should be made to see that all these forests, which have been more or less denuded recklessly, are reclothed under a planned programme of afforestation. Owing to mismanagement, there is no tree growth worth the name in any panchayat forest area. We understand that there is a proposal under the consideration of the Government to take over these forests. We suggest that this may be done at once, so that these forests may be rehabilitated by sound management.

68. The Government spends a sum of Rs. 77 lakhs (1945–46) in connexion with the administration of the 15,000 square miles of forest area under Government control. The revenue derived by the Government from the forests is shown in the following table :—

Items of receipts.	Rupees in lakhs.	Percentage to total receipts.
1 Sandalwood	22·30	14·7
2 Timber	52·20	37·4
3 Firewood and charcoal ..	33·10	23·7
4 Bamboos	10·35	7·5
5 Minor produce	13·43	9·6
6 Grazing	4·10	3·3
7 Miscellaneous (fines, forfeiture, etc.)	4·64	3·8
Total ..	140·12	100·0

All these items of revenue accrue to the Government not by any special efforts of the Forest department but because the items constitute the natural wealth of the forests. For example, the total quantity of timber extracted for the year 1945–46 is about 100,000 tons. Of this, about 55,000 tons were felled and removed by the purchasers. The quantity of fuel obtained from forests was about 460,000 tons of which only 8,000 tons were removed departmentally, the rest being removed by private purchasers. We, therefore, take it that the Forest department merely sells and permits the removal of the natural wealth of the forests in its crude state with little regard to the intrinsic value or the ultimate utilization of the products. The so-called forest protection and regeneration operations do not appear to form a substantial contribution from the department. Though a number of working plans

have been made from time to time, very little progress appears to have been made so far, as only 805 square miles were brought under working plans up to 1945–46. In Norway, Sweden, Canada, the United States of America, Finland and Russia, the forests represent a very important source of national wealth. Their maintenance and utilization are administered by the State rationally and efficiently. The tropical forests contain a larger number of species of timber and yield a greater variety of products than the sub-tropical or temperate forests. It is therefore surprising that despite an expenditure of 77 lakhs of rupees, forest development and utilization do not redound much to our credit in our Province.

69. *Timber.*—Timber is mostly confined to the forests in the Western Ghats. Our forests are deficient in teak, and though teak planting has been done in recent years, one has to wait for about half a century to extract timber. Owing to its resistance to rot and to climate, and its easy workability, teak enjoys a prominent place among timbers. We have to depend on supplies of Burma teak and the cost of teak for building purposes is often beyond the resources of the poor and the lower middle classes. During the World War, we ran short of teak, and our requirements of huge quantities of timber for a variety of purposes had to be met by "Jungle-wood". Those "Jungle-woods" have proved to be useful substitutes for teak except with reference to resistance to climate or rot. Our first object should be to prevent the possible disuse of the indigenous timber of our forests when supplies of teak from Burma are resumed. For this purpose, we would suggest the establishment of a Forest Research Institute attached to the Forest College at Coimbatore. Besides exploring the suitability of indigenous timber, and the methods of seasoning and treatment, this Institute should also examine and advise the Government on the better utilization of the various forest products.

70. The next stage in the Government programme should be that, as soon as a few species have been selected and approved for use, they should be made available to the public as seasoned and treated timber. In this connexion, we would refer to the attempts made by the Government in 1924, by way of installation of saw-mills at Russellkonda, Chenat Nair, Top Slip, Beypore and other places. The assistance of two American experts was availed of for that purpose. Some officers were also deputed to undergo training in the Philippines in lumbering and timber working technique. After some time, the mills were closed down and the project was abandoned. We do not know whether the Government have explored the reasons for that failure. We do not believe that there would have been any insuperable obstacles. We are rather inclined to attribute the closure to lack of proper foresight and managing capacity. We would suggest that the scheme be immediately revived and Government factories established at localities to be recommended by experts. Seasoned and treated timber, graded in cut-sizes and also fabricated in standard sizes, doors and windows

for use in poor and middle class dwellings should be manufactured at these factories. Depots for the sale of timber products should be opened at all places within the Province wherever there is substantial building activity. The products of the forests should be sold at these depots to consumers at reasonable prices. These depots should be operated by the Government.

71. *Paper.*—The process of grading timber will result in considerable quantities of rejected pieces. For the utilization of these and of other surplus timber, Government should instal factories in the proximity of forest areas for making ground wood pulp. This pulp will furnish the raw material for paper, cardboard, plastic and pressed-wood industries. Such production of wood-pulp will make the raw material easily available to the industrialist and also obviate the need to establish such factories at or near forest areas, where scarcity of power and labour will be a drawback. A more substantial advantage is that the selection of trees to be felled and the afforestation of clear cut areas will be under Government supervision. If the timber and the wood-pulp industries are to be left to private hands there is the risk of forests being denuded of available timber without any attempt to replant them. The different industries using wood-pulp in England and the United States of America depend to a great extent on pulp imported from Norway and Canada.

72. Apart from wood-pulp, bamboo, eta reed, botha grass and other materials are also available in our forests and are suitable for the paper industry. So far as the eta reed is concerned, we understand that the Government have already permitted a private company to start a paper mill in the Papanasam area. In this case also, we suggest that the pulping be done by the Government and supplies made to the mills according to their requirements. The bamboos of Nilambur and Wynaad forests may support a paper mill industry on the West Coast. The bamboos of Kollegal forests can certainly support another paper factory. Our attention has been drawn to the investigations of this project and a note on the subject written by Sri V. S. Krishnaswami, as an appendix to the Kollegal Working Plan. Botha grass is available in large quantities over an area of 2,000 square miles in the Ceded districts. This is a suitable raw material for making paper in admixture with long fibre pulp. Another source is bamboo from the Agency forests. A paper mill was started several years back at Rajahmundry for exploiting this source. There was no reason why it should have closed down when it enjoyed all the advantages of location and raw material. The Government may usefully enquire into the causes of the failure of this industry.

73. In connexion with the paper industry which is to be developed in the abovementioned ways, we have to clarify the position to avoid competitive and wasteful efforts. Paper production in India is already fairly advanced. Our requirements of

better quality writing paper can be met by the existing Indian mills. What we lack is newsprint and ordinary printing paper. We anticipate an increasing demand for this kind of paper with the spread of education and literacy and the rapid growth of the volume and variety of newspapers and magazines in our Province. Pulp production should aim at the supplies required for the manufacture of this variety of paper. It should be our policy to encourage the use of soft pulp and wood-pulp in proper proportions suitable for printing paper production. Exclusive exploitation of one variety may prove uneconomical in the long run. To implement this policy, it will be worthwhile for the Government themselves to undertake all varieties of pulp production and regulate its supply to newsprint manufacture and other industries. If pulp is assured, it will be the best inducement for the establishment of allied industries.

74. *Fuel.*—The population of the Madras Province is dependent almost completely on wood fuel for domestic use. During the war years, owing to the demands of the military and the factories for wood fuel as substitute for coal, great scarcity was felt by the public for fuel for domestic use. The price of fuel has gone up by about three times and it is still being rationed in some of the urban areas, being in short supply. Motor transport vehicles were consuming large quantities of charcoal during the war period owing to scarcity of petrol. Densely populated urban areas like Madras, Madura, Coimbatore and Trichinopoly consume large quantities of fuel every month. We know that the consumption of Madras City is about 16,000 tons. The idea that suggests itself to us is that instead of these vast quantities of fuel being transported to the various parts within the City, a producer gas plant may be installed and supplies of gas made to every household. In the Fertilisers Factory at Alwaye, the producer gas which is being made primarily for the manufacture of sulphate of ammonia is also supplied to the labour colonies and officers' quarters through pipe-lines for domestic use. The installation of pipe-lines may prove too costly in the present day. It should be possible to compress this producer gas into cylinders and make supplies available to motor vehicles and to consumers for use in place of petrol or fuel at depots in and outside the City. In the United States, natural gas is compressed and sold to consumers against return of the empty cylinders. This will help to reduce our dependence on petrol to a great measure. It will also result in greater economy in the use of wood fuel much of which is now wasted in the ordinary domestic use. By wood distillation bye-products can also be recovered. We would suggest the installation of a gas producer plant in the Madras City in the first instance, and if it should prove successful, its extension to other urban areas may be considered. There is no need to enumerate all the advantages that would accrue by installing such a system of supply. Bombay and Calcutta enjoy a town gas supply. To mention a few of the advantages of such a

system, it will do away with the drudgery of the kitchen, improve the general cleanliness of the house, and perhaps lower the cost of domestic fuel.

75. *Tanning materials.*—The most important tanning material is wattle. Till now, we were importing about 18,000 tons of bark every year valued at Rs. 26 lakhs besides some quantities of tannin extract from South Africa. This source of supply has now stopped. Wattle plantations have been started on the Nilgiris and the Palnis. We understand that the scheme is to be extended so as to cover an area of 21,000 acres. On a ten-year rotation, the annual production may be estimated at 10,500 tons and at 5 tons per acre. To a large extent, this will meet the demands of the tanning industry. It will be better if instead of transporting the bark from the plantation to the tanneries, arrangements were made to separate the tannin extract near the plantations and transport it to the tannery. The spent bark after extraction of tannin is a good material for pulping. Its strong fibres make excellent wrapping paper. The production of pulp from the spent bark should, therefore, be made an useful adjunct industry by the Government in these areas. Wattlewood after the bark is removed is expected to yield about 30,000 tons of firewood per annum. This may be used as fuel if a demand can be found nearby or used for production of gas for urban cities as suggested under 'Fuel.' We would, however, mention that these proposals are likely to eventuate only at a later period when the plantations begin to yield bark.

76. *Essential oils.*—A great variety of oils can be produced from our forest products. Important among them may be mentioned :—

(1) Sandalwood oil,

(2) Eucalyptus oil,

(3) Khus oil,

(4) Lemon grass oil, and

(5) Oils from spices like cloves, cinnamon, cardamoms, etc.

The work done in this direction by the Kerala Soap Institute and the Techno-chemical Institute at Calicut are worth mentioning.

77. The sandalwood extracted from our reserve forests is about 850 tons. This quantity is too small to base an oil extraction industry on a large scale. A certain amount of extraction is already made by factories in Kuppam and Mettur. The Committee visited two factories at Mettur. Representations were made to the Committee that the sandalwood is sold by the Madras Government at a higher price than that of the Mysore Government. As a result of these high prices, Mettur factories are unable to sell their oil at competitive prices. If these facts are true, we feel that the

Government must arrange for the sale of sandalwood to these factories at suitable prices. An understanding could easily be reached regarding the price and utilization of sandalwood with the Mysore Government.

78. We now import about 5,000 gallons of essential oils valued at Rs. 1,25,000. The chief oils imported are lemon grass, eucalyptus oil, peppermint oil, cloves oil and rose oil. With the considerable quantity of eucalyptus available in our forests, we should not be importers but be exporters. Similarly, we import a good quantity of cloves for use as spices from Zanzibar. Clove cultivation is possible in portions of our forest areas. The development of this cultivation should receive high priority to make our Province self-contained. When the plantations are developed, the extraction of clove oil for perfumery and for pharmaceuticals should be an adjunct industry. Khus oil is one of the most important of essential oils, but the annual production of this oil is now very small. Along with other oils, this forms an important material in the blending of good perfumes. The extraction of this oil should be developed under Government auspices as a proper industry.

79. *Grazing lands.*—At another place, we have stressed the importance of increasing supplies of milk to the people of this Province. A large extent of forest area is now being used as grazing ground. But the grazing lands receive no attention from the Forest Department. What we would suggest is that a part of the grazing lands should be taken up for the cultivation of fodder. Guinea grass and other kinds of grass can be grown successfully and supplied to our cattle farms. We suggest that, instead of leaving it to nature to produce what it can by way of grass, the cultivation of grass should be taken up at least in limited areas in the neighbourhood of dairy farms.

80. *Minor forest produce.*—These can be classified broadly under the following heads :—

(1) Vegetable origin, e.g., edible flowers, fruits, tamarind, woodapple, cashewnuts, mohwa flowers, soapnut, platter leaves, tanning barks, tanning fruits, dyes, menthol, medicinal products and spices.

(2) Animal origin : lac, honey, wax, skin, horns, bones and ivory.

(3) Mineral origin : limestone, slate, barytes, slabs, soapstone, mica, kaolin and yellow ochre.

The exploitation of these forest produce and products has not in any sense been methodical, contractors being allowed to collect and sell them. No thought has been bestowed on the proper utilization of these materials. Investigations should be immediately taken on hand by the Forest Department to see what minor products are available in the forests, and what industries could

be best started to utilize them. Forest industries would furnish ample materials at a reasonable cost for the several industries, which may be established in suitable areas and we suggest that the Government should take action immediately on the lines of the recommendations made above.

81. We are of the opinion that a Forest Industries Development Officer should be in charge of the Forest Research Institute proposed by us. His functions will include the planning, launching and execution of schemes for the full utilization of our forest products and development of forest industries on sound lines. He must have a staff of technical and research assistants who would help him in preliminary investigations, thus obviating references to the Research Institute at Dehra Dun on even trivial points. The location of the Forest Research Institute at Coimbatore where the Forest College also is situated would facilitate co-ordination of work between the Agricultural and Forest Departments.

82. We do not know what the functions of the Forest Utilization Officer are, except that he acts as a liaison officer between the District Forest Officers and the timber purchasers. When the office of the Special Officer, we have recommended above, is created we suggest that the functions of the Forest Utilization Officer may be co-ordinated with those of the Special Forest Development Officer.

CHAPTER VII.

METALLURGICAL INDUSTRIES.

Iron and steel.

83. The iron age has not, as was anticipated, given place to the light metal age. While aluminium and magnesium have found many uses as a result of World War II, they have not in any way displaced the use of iron and steel in any particular field. The production and consumption of steel is always considered a barometer to indicate the industrial development of a country. Curiously, the consumption of iron and steel in India has shown a decline during the decade ending with 1939. In 1929, the total consumption of steel was 1,651,658 tons as compared to 1,062,095 tons in 1939. The production of steel in India has, however nearly doubled itself from 400,105 tons in 1929 to 781,678 tons in 1939. The difference between the total local production of steel and the total consumption was bridged by means of imports before 1939. As a result of War and Post-war conditions, imports of steel have fallen to negligible figures. We are, therefore, experiencing a shortage of steel to-day. The present high demand for steel can be accounted for by the suppressed demand for steel now coming into prominence and also on account of the post-war development plans in all fields of national activity being put into operation. The Government of India appointed a panel in 1945 with

a special directive " to examine the possibility of attaining the steel target for the first five-year period " which was provisionally fixed by Government at 2½ to 3 million tons. The panel has recommended the manufacture of additional quantities of steel in the following places :—

	TONS.
Tata Iron & Steel Co., Ltd.	150,000
Mysore Iron and Steel Works	30,000
The Ishapore Ordinance Factory (by adding two more furnaces and producing basic instead of acid steel)	60,000 to 70,000
The Steel Corporation of Bengal	200,000 to 300,000

It has also recommended the starting of two new units with an initial capacity of 500,000 tons each per annum. Recently, the Government of India announced that they proposed to instal two plants in the Central Provinces and Bihar, which will be owned and managed by the Government.

84. Neither of the new plants is proposed to be located in the Province of Madras. Considering the importance of the iron industry, this has naturally given rise to some disappointment among our politicians. Recently, at the Industries Ministers' Conference held at New Delhi on the 15th and 16th December, the Minister for Industries in our Government put forward a claim for the establishment of an iron and steel plant in the Madras Province.

85. Madras Province possesses a large quantity of medium grade iron ore in the Salem and Kurnool districts. The ore itself, while having a low sulphur content, has a large silicon content. The separation of the silicon content is theoretically feasible on account of the magnetic property of the ore; but will necessarily involve additional cost.

86. Our chief difficulty in exploiting our iron ores is not so much its silicon content or its lower percentage but the absence of coking coal near at hand. It has, therefore, been suggested that the lignite deposits of Cuddalore may be used for extracting the iron from the ore. As we have said elsewhere, the question whether the lignite could be converted into coking coal is a considerable technical problem and no decision can be taken about the iron and steel industry until we have developed the lignite mines and perfected an economical process for the conversion of lignite into coking coal.

87. Apart from these facts, the economics and the practicability of the iron industry in the Madras Province require dispassionate consideration. The Mysore Government started several years ago an iron and steel industry in Bhadravathi depending on

the vast forest area in the Shimoga districts to provide the necessary charcoal for smelting. It is now admitted that the use of charcoal as a substitute for coal has proved both costly and unsatisfactory. Not only has there been a denudation of the forest area, but also the cost of transport of charcoal to the factory has disproportionately increased owing to longer distances between the centre of supply and the factory. The capacity of the Mysore plant using charcoal was limited to about 30,000 to 35,000 tons per annum as against the production of Tatas which is 997,500 tons. Compared to Tatas, the Mysore factory appears to be pigmy in size, and it is very doubtful whether if it were run as a commercial proposition, it could be considered an economic unit. The Mysore Government now propose to instal electrical furnaces of the Norwegian type for the reduction of the iron ore into pig-iron and also to increase production to 60,000 to 70,000 tons per annum. We do not know if the Mysore Government have worked out the economics of electrical reduction of the ore. The power for the electrical furnaces will be supplied by the Jog Falls scheme which, on its completion, will have a rated capacity of 120,000 KW. The cost of the power supplied to the industry is expected to be 0·1 of an anna per unit. (The cost of production of power at Pykara is about 0·2 of an anna per unit.) We wonder if this can be achieved considering that the cost of hydro-electric machinery, transmission lines and other works are to-day two to three times more than what they were when the Pykara system was installed. The quantity of power which Mysore would have to use for its iron industry would be about 30,000 KW which means a quarter of the total output of the Jog Falls scheme. Again, the use of electrical power does not altogether dispense with coke which would still be required for conversion of pig-iron into mild steel. The panel committee, after careful examination of the possibility of having electrical reduction of the ore, came to the conclusion that it cannot be considered economical. We agree with the views stated by them. We must, therefore, rule out the possibility of Madras being able to convert its ore into iron by using electrical power. Apart from the consideration of the cost of power, Madras is not so fortunately situated as the Mysore State in regard to electrical power. The total available supply of hydro-electric power at present is 56,350 KW per year. If we are to have a plant of the size of the Mysore plant, we will be consuming 53·24 per cent of this total available energy and thereby starving our other industries. We cannot, therefore, help drawing the conclusion that neither the use of charcoal nor electricity is a practical proposition so far as the Madras Province is concerned. Considered in all aspects, therefore, we cannot envisage an iron and steel industry in the Madras Province as a short-term proposition.

88. We are, however, impressed with the need to make ourselves to some extent independent of steel supplies, not merely of

imports from overseas but also from other provinces. It is not as if the Madras Province will not get its fair quota of steel from the central plants in India. But if we could also locally produce some steel and supplement our imports, we shall be giving a great impetus to our agriculture and to our industries. On this question, we are much intrigued by the proposition of making steel from scrap. There are already two re-rolling mills in the Madras Province engaged in rolling small sections of steel like bars, flats, angles, etc. The one at Negapatam has an output of about 1,500 to 3,000 tons of steel per annum and the factory at Bezwada has an output of half of this figure. It appears possible to contemplate the expansion of this industry and to set up two more factories in Madras Province. We recommend that scrap collected from railway workshops and large steel works and billets purchased from steel makers can be taken up to make steel products including those used in agriculture like crowbars, pick-axes, country-cart-tyres and the like. Some of the steel can also be processed in small electric furnaces to yield special steel in significant quantities. It is also possible to use the steel for the purpose of making bolts and nuts, nails, plates, etc. Before the war, the quantity of steel scrap exported from India is estimated at 50,000 tons annually and it will be safe to say that about 20,000 tons of steel scrap can be annually acquired in this Province for purpose of re-rolling. This quantity is likely to be maintained for quite some years to come and can be a safe basis for investigations on starting the steel re-rolling industry. The smelting furnace to smelt steel with an output of about 6 tons per charge would consume power of the order of 1,600 KWs. and would cost roughly Rs. 2,75,000 to purchase. On a three shift basis this furnace can produce 5,000 tons of steel sections per annum. A rocking furnace with a smaller capacity of 3 tons per charge would cost about Rs. 3,00,000 and would consume very nearly the same power, i.e., 1,600 KWs. But because of the shorter duration of smelting and the economies achieved in labour and time for charging and discharging, such a furnace is capable of operation on four or five charges per day basis. It would yield practically the same quantity of 5,000 tons of steel sections annually. The auxiliary equipment for rolling, etc., would consume 1,000 KWs. of power and can be set up at a cost of Rs. 3,00,000. It appears to be an economic proposition to consider seriously the location of two steel re-rolling industries. The provision of electric power for furnaces and industries of this description is likely to benefit the electricity system to the extent that it improves their over-all annual load factor. There are other indirect advantages to secondary industries that will grow up around these. The estimated annual consumption of bolts and nuts in India is roughly 50,000 tons. At least, one-half of this quantity is still imported and it is considered advisable to encourage an industry for making bolts and nuts and several smaller units for making wire-nails in the Province. The wire-nail factories can be set up even as cottage industries and at any rate as small

scale industries in the villages. We have elsewhere made a recommendation about a galvanizing plant and we feel that bolts and nuts and wire-nails can with advantage be galvanized if such a galvanizing plant be set up. The Panel Committee has dealt with this problem in a rather summary way dismissing it as a very expensive process and deserving of no encouragement. In the absence of technical data, we are not inclined to dismiss the proposition so lightly. We cannot forget that Japan was able to meet her requirements of steel in a substantial measure by import of scrap from the United States and from India. If it was an economic and practical proposition for Japan, we do not see why it could not be likewise for India. In our opinion, electrical furnaces of medium capacity should be located at those centres in the Province where scrap could be locally available. The collection of scrap to conserve our supplies of steel should be taken up in a serious way. Railway scrap used to be auctioned annually at all their workshops. Supposing we were to instal electrical furnaces for utilizing the scrap in the neighbourhood of railway workshops at Negapatam or Trichinopoly or Madras, we may be assured of steady supplies. Again, a battery of furnaces near Madras could utilize scrap imported from Calcutta and other ports in India.

89. Another suggestion that we make in this connexion is for the factories to utilize the seasonal power at Mettur or other hydro-electric schemes which have a fluctuating output to melt the scrap and build up a stock of billets during the season. The factory may be engaged during the off-season in rolling the billets.

90. The recommendations made by us for the installation of steel furnaces and rolling mills for utilization of scrap are made by us as laymen. We are not suggesting that they could be adopted without an exhaustive and careful examination. Our recommendation, therefore, is that the Government should constitute a Committee of experts having experience of steel industry to examine the suggestions that we have put forward and make their recommendations to the Government.

[*A dissentient note by Sri R. Suryanarayana Rao*, M.L.C., *and Janab M. Mohamed Ismail*, M.L.A., *is printed at the end of this report.*]

CHAPTER VIII.

Non-ferrous Metal Industries.

91. The report of the Non-ferrous Metal Industries Panel has been made available and our report should be read in conjunction with it.

92. *Copper.*—The total pre-war consumption of copper is estimated to be 35,000 to 40,000 tons per year. There is only one copper mining company in Singbhum which extracts about 6,000 tons of copper annually. In ancient history, South India was

supposed to be rich in copper ore. Traces of old workings can be seen in the Bellary district and in Guntur and Kurnool districts. The village of Garimenpenta in the Nellore district was geophysically examined by a firm of German Geophysicists who have marked out certain zones indicating the existence of ore pyrites below a depth of 1,000 to 1,200 feet. Further investigations have not been made and until to-day no serious attempt has been made to estimate the quantity of copper ore that is available in these areas. As we have seen, India is very deficient in copper and with the anticipated post-war development of electrical and other industries the consumption of copper will be more than doubled. The copper ore itself is normally found in the form of copper pyrites and in the extraction of copper, it will be possible to separate sulphur which again is a mineral for which we depend on foreign imports. We would, therefore, suggest that early steps should be taken for a thorough investigation of the possibilities of having a copper mining industry in this Province.

93. The Panel Committee has recommended the erection of a modern rolling plant for production of brass sheets in the neighbourhood of Madras. The cost of the plant is estimated at 50 to 60 lakhs of rupees for an annual production of 8,000 tons of sheet.

94. *Aluminium.*—There are at present two companies in India producing aluminium. They are the Indian Aluminium Corporation of India, Limited, at Asansol and the Indian Aluminium Company at Alwaye. The former produces about 800 tons a year and the latter about 1,600 tons. The total estimated consumption of India is about 3,000 to 3,500 tons a year. Formerly, the raw material which is bauxite used to be imported from Canada. Both the companies have now started utilizing the Indian ore. The total Indian production is at present 2,400 tons. The reduction of aluminium is an electro-metallurgical process requiring large quantities of electrical power at very cheap rates. In the Madras Province bauxite is being mined in the Shevaroy Hills in Salem district for making abrasives. Dr. M. S. Krishnan has estimated that the total reserves amount to about two and a half million tons. We are of the opinion that the production of aluminium from the Shevaroy's bauxite cannot be thought of as a short-term industry. The Canadian factories producing half a million tons are capable of flooding the world market with cheap aluminium. We would suggest it might be considered on the long-term basis when surplus electric power is available. Another line of enquiry that we would suggest is this: In the Indian Aluminium Company (with its reduction work at Alwaye), the Travancore Government and the famous Alcoa are both interested. Formerly the Alwaye factory was getting its ore from Canada, but recently it has changed over to Indian bauxite which it gets from its mines in Bihar (Muri Junction). This plant compared to the Canadian plant must be characterised as pigmy. It is, however, in a position to use the best technical skill required for the industry and we believe

has trained some Indian personnel at the Canadian factories. As Travancore is likely to have large surplus of electric power if Pallivasal and other schemes are developed further and as we are in a position to supply the ore from Salem, it is worthwhile investigating whether that factory cannot be expanded. The Madras Government may own an interest in it along with the existing interests. We may mention that the Indian Aluminium Company have a rolling mill at Belur near Calcutta and a smaller one at Madras City.

95. *Tin.*—No workable deposit of tin ore has been discovered in India. We have depended on supplies from Burma and Malaya. Tin is a very essential metal for our industries as it has a variety of uses. Considerable quantities of tin were recovered in the United States, Japan and Germany by detinning tin plate scrap. We have suggested elsewhere installation of scrap smelting furnaces in our Province, where the detinning process could be employed and recoveries of metal effected.

96. *Lead.*—Lead is a very important element having a variety of industrial uses. Pigments of lead are used in the paint industry as white lead or red lead. Lead pipes are used in sanitary installations and in chemical industries. Lead sheets are used for lining tea-chests and also for chemical industries. Alloys of lead are used for accumulator plates, for solder, etc. The anticipated consumption of lead in the coming years is estimated at 25,000 tons per year. So far only very small quantities of lead are being extracted in India at Hazaribagh (Bihar), Manbhum (Central Provinces) and in Jaipur State. Lead has been known to occur in the Cuddapah, Kurnool and Guntur districts. Some of the ancient currencies of the Andhra Kings were of lead. They are of the argentiferous varieties and in the old workings the surface ores have been completely extracted. No geophysical survey has been done to find out whether lead exists at workable depths. Considering the importance of lead in industry, we strongly recommend that investigation into the deposits should be taken on hand immediately. We suggest that a factory should be set up in the Madras Province for making white lead from imported lead metal in the first instance. White lead is a base for paints and we would refer in this connexion to our chapter dealing with the paint industry.

97. *Magnesium.*—Magnesium metal has come into prominence in aircraft industry during this war. The sources of the metal are magnesite or sea water. The largest deposits of magnesite, perhaps in the world, are found in the Chalk Hills of the Salem district. The deposits are of exceptional purity and are at present being mined for making refractories and sorel cements. As we have said another source of magnesium is sea water where it is found in solution as salts of magnesium. We do not know which of the two processes is more economical, that is, the treatment of the magnesite ore or of the alkali salts for the production of

magnesium metal. We suggest as a long range plan the starting of an industry for the extraction of magnesium metal either from magnesite or from magesium salts. An experimental plant may, however, be set up now.

98. *Manganese ore.*—Manganese of high percentage is found in the Vizagapatam district and in the Sandur State of the Madras Province. It is used as an alloying element in iron, brass and aluminium. It is also used in the manufacture of dry cell batteries and as pigments in glass and ceramic industry. We suggest the starting of a dry cell manufacturing industry using pyrolusite after processing.

99. *Beryllium.*—Beryllium has become a strategic mineral during the last war on account of its fatigue-resisting qualities. Combined with copper it forms one of the hardest of metals affording greatest resistance to wear. Beryllium is found in the Nellore district occasionally among the mica deposits. On account of its strategic importance, we are of the opinion that the export of beryllium should be controlled and whatever quantities of ore are mined should be conserved to build up a stock within India.

100. *Barium.*—Barium occurs in large quantities as barytes in the Ceded Districts. Their most important use is in the paint industry.

Extract of the Recommendation of the Panel on Non-Ferrous Metal Industries.

1. "We suggest that the production of brass sheets should be encouraged on a regional basis and that modern rolling plants should be erected one in the South (near Madras)."

2. *Aluminium sheets and circles.*—"We feel that two up-to-date rolling mills—one in South India producing 3,500 tons of aluminium sheets per year should be put up."

3 *Magnesium.*—"Two schemes for production of magnesium metal have been brought to our notice—one to be started at Kharaghoda on the outskirts of the Rann of Cutch and another for treating the magnesite of Salem. We suggest that Government sould examine these schemes in detail and assist in making them practicable."

4. "We propose that plants for the Non-ferrous Metal Industries should be distributed as follows:—

Plants for semi-manufactures.

Metal.	Location of existing plants.	Location of future plants.
1 Aluminium cables ..	Nil	Bombay, Punjab and South India.
2 Aluminium powder ..	Bengal	Bombay and South India.
3 Copper brass sheets and circles.	....	Larger Mills in Bombay, South India, United Provinees, Punjab, Sind and Bengal.
4 Copper cables	....	Punjab, Bombay and South India.

Plants for Non-ferrous refining industries.

5 Electrolytic tin from scrap.	....	Bombay, Bengal and Madras.

CHAPTER IX.

Electrical Machinery and Equipment.

101. The Electrical Machinery and Equipment Panel constituted by the Government of India have made recommendations regarding the development of existing and new electrical machinery and equipment industries in India. There is no need to emphasise the necessity for starting these industries at an early date in this Province in view of the projected schemes for the development of electrical energy. In assessing the needs of the Madras Province, we have to take into consideration our present requirements for electrical machinery and equipment, the demands of the projected schemes of development and the sustained demand at a future date for the products of these industries. In the post-war development schemes formulated by the Madras Government we believe that no recommendation has been made regarding " nursery power schemes " which are being investigated by the Bombay and the Central Provinces Governments. If the " nursery power scheme " is also adopted by the Madras Government (which we have recommended elsewhere in our report) there will be a substantial demand for original equipment and replacement.

102. The raw materials necessary for electrical industries are : Electrolytic copper, electrical steel, pig iron, rubber, mica, shellac, cotton and silk, porcelain, plastics, ball bearings. Of these, we have to depend upon imports from other countries of electrolytic copper, plastics and ball bearings. The other raw materials are available either in the Madras Province or could be procured from other Provinces. The equipment recommended for manufacture are—

Motors, generators, transformers, electrical cables and wires, switch gear, distribution poles and pole fittings, insulators, electrical machine instruments, fans, radio sets, lamps, electric fittings, storage batteries, telegraph and telephone equipment, refrigeration and air conditioning machinery.

103. The Panel Committee has made a fairly exhaustive study of the prospects of these industries and have also fixed targets of production having regard to the estimated demand in each class of goods. We do not propose to deal with these matters here, as the panel report will be soon available for reference to the public. We propose to confine ourselves to recommending the establishment of some of these industries within the Madras Province.

104. *Electric motors and generators.*—We do not think that there is any need to make electrical generators a provincial industry. If at all it is desired to set up a plant for the making of generators of a high output capacity, we would suggest a central factory in the Mysore State, in which the Madras Government, the Mysore Government, the Travancore Government and the

Cochin Government could be jointly interested. The demand for generators is not likely to be big and the prospect of an industry serving the Madras Province alone cannot be considered remunerative.

105. Regarding motors, there is a large demand both for agricultural and industrial requirements. The number of agricultural pumps working in the licensee areas is about 360 while the number in the Government areas amounts to about 5,700. Motors may be classified as A.C. three phase, slipring motors, A.C. fractional horse power motors and A.C. three phase, squirrel cage motors. Slipring motors of 25 h.p. capacity may be made. Squirrel cage motors up to a capacity of 20 h.p. may be made. Along with these motors the necessary starters should also be manufactured. The average annual import of motors during the five years preceding the Second World War was about 4,800 numbers costing about six lakhs of rupees. The factory may be located in Madras or Coimbatore and perhaps an existing factory with manufacturing experience in this line may be expanded.

106. *Transformers.*—At present, transformers are made in South India only at the Mysore Government transformer factory. From all reports they have proved satisfactory in working. The electrical workshop in Mettur has just started the overhauling and fabrication of transformers; but it is still being done only on an experimental scale. The Government themselves will be the largest consumers of transformers. We would suggest therefore that a transformer factory to meet the requirements of the Government and of the industry may be established either at Mettur or elsewhere where facilities exist. The manufacture may be limited to capacities having a large demand. The necessary silicon steel, we believe, is now being manufactured by Tatas.

107. *Electrical cables and wires.*—There are at present two factories in India making electrical cables and wires. But their output is hardly sufficient to meet the Indian demands. The main drawback in regard to the establishment of this industry is the dependence on foreign imports for the hot-rolled electrolytic base copper rods. At another place, we have referred to the occurrence of copper ore in our Province. Their investigation should be taken on hand immediately. A factory for the production of electric cables and wires may be set up at Madras using imported copper until we are in a position to extract copper from our ores. Aluminium conductors and wires can be used widely and the factory can take up these manufactures also.

108. *Switch gear.*—They may be classified into (1) iron clad domestic and industrial switch gear of 15 to 200 amperes capacity, (2) manually operated disconnecting switches suitable for voltages up to 33 K.W., (3) simple type switch boards, and (4) fabricated switch boards.

109. Of these we may confine ourselves to the manufacture of the first class in this Province. A factory for the manufacture of these as well as electric starters and electrical accessories may be conveniently located at Madras.

110. *Distribution poles and pole-fittings.*—We are depending to a very large extent on imported poles to carry our distribution lines. During the war, great scarcity of this material was felt and the alternative of using wood or concrete poles was tried. Pole-fittings may be made in the factory which we have projected for starter and electrical accessories, etc., at Madras. So far as poles are concerned, we would refer to our recommendations regarding iron and steel industry in the Madras Province.

111. *Insulators.*—The Government are having a porcelain factory at Nellore which could undertake the manufacture of low tension insulators. Regarding the manufarture of high tension insulators, we suggest a joint enterprise between the Government of Madras and the Mysore and Travancore Governments. High tension insulators require costly testing laboratory and equipment and considering that the requirements of such insulators will be limited except during the periods of expansion, it will not be economical to set up a separate factory for their manufacture in the Madras Province.

112. *Electrical measuring instruments.*—They comprise a large class of instruments such as ammeters, voltmeters, meggers and house service meters. The only instrument for which substantial demand exists is the house service meter. It is a precision instrument and its manufacture requires not merely imported materials but also costly testing apparatus. Here again, we suggest that the manufacture of house service meters should be taken up as a joint proposition with the Mysore and Travancore Governments.

113. We do not recommend the manufacture of other electrical equipments except on an All-India basis. There are a number of factories in India producing electric lamps. Of these, one is situated in the Mysore State. The quality of the products manufactured by the factories in India is not uniform though during the time of war they were able to meet the Indian requirements to some extent. We understand, for instance, that the manufacture of glass shells for electric lamps is now being made by an obsolete process and the result is that the finished product is not up to European standards. A plant for the automatic production of glass shells will have a capacity far in excess of the requirements of any single lamp factory. It is therefore essential that a central factory for the manufacture of glass shells should be promoted by the present manfacturers of electric lamps. This could be located either in Travancore or in Mysore where raw materials for the manufacture of these shells exist. We understand that permission has been granted for the starting of an electrical lamp factory in the Madras Province. We do not know what progress has been made so far to set up that factory. We suggest that the Madras

Government should take up the matter with the Central Government for the purpose of summoning a conference of the existing lamp manufacturers not merely with a view to secure the erection of a central factory for the manufacture of glass shell but also to enforce technical standards for their products.

114. The other industries which we recommend for establishment are—

The manufacture of refrigerators and air conditioning equipment and radio sets. For the latter there will be a growing demand. The Madras Radio and Electricals, Limited, which was started with Government aid has unfortunately relaxed executing its objects. The Mysore Government have assisted the establishment of an enterprise for the manufacture of radios called Mysore Service, Limited, in conjunction with certain English manufacturing interests. That enterprise though it came into existence later than the one in Madras has made progress in the erection of the factory and installation of the equipment. As the Madras Government will be requiring a large number of radio sets for rural propaganda, we suggest that they should seriously interest themselves in the affairs of the Madras Radio and Electricals with a view to start production at the earliest opportunity. The radio industry will have to be in the initial stages an assembly unit, but in course of time it may take up the manufacture of the various components.

CHAPTER X.

Heavy Machinery Manufacture.

115. The Heavy Machinery Manufacture Panel has reported to the Government of India. Some disappointment is felt amongst industrialists of the Madras Province that no recommendation has been made for the establishment of a heavy machinery plant in South India. It must be remembered that one cannot set up a factory for the manufacture of sugar machinery, another for vegetable ghee machinery and a third for cement machinery. To keep each of these factories going there must be demand—not a pent up demand but a sustained demand. The demand for capital goods unless we have a good export market is likely to be very restricted. We have to consider whether even India as a unit can afford to have so many heavy machinery factories. There can be no question of each Province trying to have one. Possibly, one heavy machinery industry which might prove successful is for the manufacture of textile machinery but a factory capable of manufacturing process equipment of various kinds might also be considered. Considering the number of textile mills in India even if complete plants cannot be sold as they are produced, the factory can still engage itself in the manufacture of spares for textile plants. Such an industry has now been projected by a combination of Bombay industrialists and English manufacturing interests,

and we do not see any scope for another such industry in the South. Rarely have we a concern engaging itself in the complete manufacture and fabrication of a manufacturing plant of a heavy type. The firm which takes orders for a certain type of capital machinery may have perfected the design of the plant, may hold some patents incorporating special features, and may be engaged in making some of the vital and precision parts; but will not ordinarily be manufacturing every part which goes to make up the entire plant. A heavy machinery manufacturing industry is really based upon a number of independent units engaged in specialized manufacture. For instance, the auxiliary industries will be specializing in the manufacture of iron and steel castings, forgings, tubings, bolts and nuts, springs, bearings, tools and gauges, valves and fittings and electrical equipment, etc. Bearing this in mind, we have suggested elsewhere the establishment of a large number of engineering workshops, some of them engaging in special productions. But at the same time one or two of the engineering industries must maintain a research department to study the working and efficiency of the various machineries already installed in India with a view to effect any improvements upon them to suit Indian labour, raw material and other factors. Once the industrial research engineer has designed the plant and made his blueprints, it should be possible for the firm which employs him to fabricate a complete plant for the manufacture of any special class of goods by distributing orders for various portions of the plant with the firms specializing in their manufacture. We cannot, therefore, encourage the criticism that no allotment of a heavy machinery plant has been made to the Madras Province. Unfortunately, the engineering facilities that exist in Bombay and Calcutta do not exist in Madras and any industrialist proposing to set up machinery manufacture will have to face the problem of having to make every component part of the entire plant himself.

116. On the other hand, we suggest that our industrialists may consider the manufacture of certain types of machines which enjoy a sustained demand in the Madras Province. These are: oil expellers, decorticating machine, ginning presses, rice hullers, coffee grinders, flour mills, lathes, drilling and milling machines, etc. Here again, we cannot help remarking that although we attempted making oil expellers in our Province we were not able to produce a reliable and satisfactory type of machinery, and as a result, immediately after the cessation of war, very large number of orders have been placed in the American and English markets for oil expeller machines. This statement is contested by a local manufacturer who puts down the preference to foreign makes as mere prejudice and challenges a test of his products for equal performance and efficiency.

117. We would suggest here that the Madras Government or a State-aided concern should set up a complete galvanizing plant which will not only execute Government work but also take private

orders. Such a plant is essential for galvanizing electric poles, pole fittings, and for making many of the sanitary containers used by the public bodies and for galvanizing various other articles used for essential purposes.

118. *Automobile industry.*—While nearly half a dozen automobile industries have been projected in North India no industrialist has come forward to start an automobile industry in South India. In our opinion, an automobile industry to manufacture light and medium industrial vehicles should be started in Madras. As our Government is likely to be one of the largest users of transport vehicles, the Government may take a large interest in such an industry. We do not think that the industry should start initially with the manufacture of the entire motor vehicle. In the first place, it may import the engine unit from some manufacturer either in England or in the United States and fabricate the chassis and other parts within the Province. Such an industry will have this advantage that its product being a utility vehicle it will be judged by its mechanical efficiency and not by its modernity or trimmings. This industry can come into existence as soon as the workshops which we have envisaged for the manufacture of auto-parts and electrical accessories of cars such as dynamos, spares, etc., are established. A motor industry for India cannot succeed if it copies the American conveyor belt method. It should adopt the pre-war methods of British motor manufacturer. Even to-day there are manufacturers of high quality cars in England whose products may be said to be custom built. The demand for private cars in India within the next decade is not likely to be very large and being a luxury article preference will not necessarily be shown to cars manufactured in India.

CHAPTER XI.

Prime Movers.

119. As pointed out elsewhere in our report, we do not have enough power to meet the increasing needs of the growing industries. To make up for this deficiency of power, prime movers are essential not only for the various industrialization programmes, major or minor, but also for the development of irrigation and for bringing vast areas under cultivation. Prime movers are machines which obtain from nature energy at first hand for transmission of, or transformation into mechanical energy such as : steam engines, steam turbines, oil engines (diesel and semi-diesel), gas engines, gas turbines and jet engines hydraulic or water turbines, wind mills, etc.

120. Prime movers are of fundamental importance to every industry as they provide the power plant for all purposes. At present, we have to depend on overseas supply of this vital

machinery. If this industry is well established in this Province, it will not only assist industrial advancement but will effect economy in external finance.

121. For purposes of planning with due co-ordination to the needs of the country, prime movers may be dealt with under the following heads :—

(1) Large prime movers—steam and oil engine power plants for capacity over 20,000 K.W.

(2) Medium capacity prime movers—steam and oil engine—capacity, 500 to 2,000 K.W.

(3) Small power units up to 500. Steam and oil engine plants.

(4) Hydraulic prime movers.

(5) Pumps, air compressors, etc.

It is not expected that the demand for prime movers of over 2,000 K.W. capacity will be large as such large units will be required only in heavy industries like iron and steel industries, metallurgical plants, heavy chemical industries, etc.

122. Prime movers of capacity between 500 to 2,000 K.W. and below are considered suitable for regionalised industrial centres and individual industries which give scope for large employment. A larger demand for these units is to be expected and steps should be taken to speed up their production. We, therefore, consider that factories for the manufacture of these units which will be in popular demand should be started as quickly as possible. One or two industrialists have already made arrangements for the manufacture of diesel engines in co-operation with British firms. In any event, except for engines of small capacity not exceeding 20 h.p., any plant for the manufacture of prime movers must, in the first instance, be a central plant for all India. We do not consider that the Madras Province offers any advantage for its location in its area. Smaller units coupled with water pumps or even without pumps will be in large demand in our Province mainly for agricultural purposes and to a lesser extent for small industries. The manufacture of these units in our Province could be taken up on a modest scale.

123. With regard to hydraulic prime movers, every hydro-electric scheme has its own special requirements which need individual consideration. We doubt very much if the manufacture of hydro-electric plants could be taken up in India for some years to come. It is considered that the existing manufacturing capacity for pumps, air compressors, etc., could be expanded to meet all requirements for the present.

124. As regards the question whether the prime mover industry to be established should be nationalized or whether it should be otherwise, we agree with the recommendation of the panel

appointed by the Government of India on this question, that for quick action, economy and efficiency, the industry should be entirely left to be organized by private enterprise. For the establishment of this industry on sound basis, we consider that it is necessary to arrange for the requisite technical man-power of the different types and grades as required by the industry. The Government of India may be asked to raise quickly an adequate number of technical personnel which is a pre-requisite for the prime mover industry. If, however, private enterprise is not forthcoming, there is no other option for the Government than to start its own factory.

CHAPTER XII.

Engineering Workshops.

125. Modern industrial enterprises though requiring specialized machinery for making different kinds of products still have certain common units such as boilers, motors, filter presses, centrifuge vacuum pans, etc. If the plans for the rapid industrialization of the Madras Province materialize, we will be requiring large quantities of such common machinery. To-day we have to depend solely on foreign imports for every kind of machine used in our industries. For instance, a textile mill requires a large number of electric motors and these are now ordered as part of the textile machinery. While we may not be able in a short time to make ourselves independent of foreign imports, we can still manufacture and fabricate certain parts of the machinery and so reduce our dependence on foreign manufacturers. Again, facilities for engineering services within reasonable distance of factories are essential for more economical and efficient working of our factories. Some of the industries that can afford have set up workshops of their own. It means additional capital outlay The workshops themselves are never fully employed and form an unnecessary and costly adjunct to any industry. The industries which have not provided themselves with workshops are at a disadvantage. The management has to seek the aid of workshops at some distance even for minor repairs. Whenever any temporary breakdown of machinery occurs in a factory resulting in the stoppage of work, the industrialist has to submit to inordinate delays before he can re-commence production after effecting these repairs. This results in incurring standing charges and loss in production out of all proportion to the cost of repair to the machinery. To-day such services are available mainly in Madras, Coimbatore and Madura. A list of important engineering workshops situated in these and in other districts is given in Appendix XV. No industrialist has come forward to undertake the establishment of engineering workshops in the districts to supply the needs of the existing industries for engineering services. The number of workshops is meagre considering the

extent of the Province and even the equipment of some of the existing workshops is too poor for undertaking any major repair work.

126. In regard to new industries, a good portion of the machinery can be fabricated within the Province provided there are workshops equipped to undertake them. The mounting cost of imported capital equipment makes it all the more necessary to tackle the problem of affording engineering facilities in this Province at the shortest period of time.

127. A list of machines, machine parts and machine tools manufactured in the Province by the various firms is given in Appendix XVI. They have been classified under the following heads, namely, agriculture, machine parts, transport and general.

128. We have now to take up the question of not only increasing the production of the several items of above machinery but also to start the manufacture of new items of machinery to suit the expanding needs of industries and of agriculture. Agricultural operations require mechanical equipment such as ploughs, mummaties, pumps and lifts, water buckets, axes, knives, etc. The transport of agricultural produce can be handled more efficiently and with less damage to the roadways if pneumatic-tyred vehicles are put into operation. Municipalities, district boards and minor irrigation works are constantly in need of workshop facilities in connexion with the discharge of their responsibilities.

129. For these purposes, we would suggest that general purpose workshops should be started in every district. These workshops should undertake simple fabrication or manufacture of material for the purpose of any industry in the district including the fabrication of steel structures for factory and other buildings. They should also undertake repairs, overhauling of electrical motors—both agricultural and industrial—and of diesel engines. They should undertake repairs of machinery belonging to the local authorities and the Government. These will intially constitute the range of their repairing and overhauling department.

130. On the manufacturing side they should undertake the manufacture of agricultural implements, carts for being fitted with pneumatic tyres, farm and domestic utensils such as buckets and pans, etc., hardware, such as hinges, bolts, etc., and small castings. These would require the setting up of a machinery workshop, an electrical repairing section and a foundry section.

131. Further there are at present a number of Government and technical institutes to which are attached workshops mainly for providing practical training for students. If the proposed district workshops recommended by us are established, these will also serve the purpose of providing practical workshop instruction to the students of the several industrial schools. This will obviate the need to maintain the workshops now attached to the industrial schools. Thus, these workshops will serve the dual purpose of

a technical school and practical workshop on commercial lines. These workshops will attract the rural blacksmith for training. A combination of traditional craft and modern practice will help in the building up of a new class of artisans in our villages.

132. It is not, however, our intention that all these workshops should be of the same type confining themselves to the repair and manufacture of simple tools and machinery. Out of these district workshops, a few should be selected for specialized work on a regional basis. We would suggest that specialized workshops may be established in Coimbatore, Madura, Negapatam, Madras, Bezwada, Vizagapatam and Bellary. The specialized workshops should have additional equipment such as electrical furnaces to handle steel and non-ferrous metal castings, equipment for hardening, for dye-stamping and deep drawing and such other specialized equipment. They should also be able to undertake the repair and overhauling of Government transport vehicles and the manufacture of at least a few autoparts. These regional workshops should also be in a position, in course of time, to duplicate all the machinery now used in major industries like sugar, cement, oil hydrogenation, textiles, etc.

133. We consider that the opening of the district and regional workshops will absorb local supplies of scrap iron and scrap copper which are being exported to other places in large quantities. It will help to reduce not merely the cost of raw materials but also our dependence on imported supplies.

134. The question to be considered in this connexion is whether these workshops should be managed by the Government or should be entrusted to private management. There is always the danger, in Government enterprise, of the manager not being invested with sufficient discretion for the purchase of materials and equipment as and when the need arises. Apart from this the overhead charges of a workshop run under Government management may be greater. It seems to us that if these workshops are really to serve the purpose for which they are intended, the management should be left to competent hands with freedom to take the initiative in any matter. A combination of Governmental and private enterprise would, we think, be best for this purpose. The Government may own a major interest in the workshop and impose certain conditions on the management regarding the kinds of work which they should undertake and for ensuring that the rates charged by them are reasonable. We would refer in this connexion to the views expressed by us at another place generally in connexion with the management of Government enterprise.

135. To implement our proposals in the event of their finding acceptance with the Government, it will be necessary to constitute an expert committee consisting of mechanical engineers from official and private services to draw up detailed plans to carry out the scheme outlined above with such alterations and improvements as might appear desirable to the Committee.

CHAPTER XIII.

Building Industry.

136. The Health Survey and Development Committee of the Government of India have observed that "Housing should be regarded as one of the major problems which should be attacked with all the resources which the Government can mobilize and should be given high priority." The increase in population and the cessation of house-building activity during the war period have resulted in the acute shortage of house accommodation. It is not possible for private enterprise to relieve the shortage in a short time. The Government of Madras have already realized the importance of providing housing accommodation in the Province. They have appointed a separate committee to suggest ways and means for relieving the housing shortage. We are only concerned here to suggest the steps that should be taken to make available large quantities of building materials without which no national housing scheme can be implemented.

137. The materials necessary for the construction of dwelling houses are—

(1) Bricks, tiles and stone.
(2) Lime and sand.
(3) Cement.
(4) Wood.
(5) Iron and steel.

These have become rather scarce and costly. The variety of materials used in building construction makes it rather difficult to indicate the general price trend or the available quantity under each category.

138. *Bricks.*—We have no data to determine even approximately the quantity of bricks and tiles that would be required in the next year. It is, however, certain that when other building materials become available freely there will be a demand for large quantities of bricks for some years to come. The brick-kiln owners are at present unable to increase their production or to offer bricks at reasonable prices owing to shortage of fuel and high cost of labour.

139. The manufacture of bricks and tiles commonly known as country bricks and tiles is a seasonal industry. They are manufactured in the non-rainy months in a crude way and burnt in with considerable waste of fuel. About a third of the bricks are either unburnt, underburnt or overburnt. Brick manufacture, therefore, is capable of improvement in two ways, i.e., in the method of moulding and in the process of burning. Moulding can be improved by proper mixing and grinding and by drying the bricks under cover. The process of burning can be improved by loading the bricks in a continuous kiln and using agricultural wastes such as paddy husk, groundnut husk, coal dust or slack coal as fuel. The heat value of the fuel required for burning a unit of brick in

a continuous kiln is about 40 per cent of that required for burning a unit in the country kiln. In other words with the quantity of fuel now used, our brick production can be increased by two and a half times. As the brick industry is in the hands of conservative people, it is not likely to be modernized. We recommend that the Government should start a few brick kilns at suitable centres in the Province. This will not be a novel enterprise for the Government. As early as 1866 the Government of Madras started a brick field in Madras to supply bricks for the construction of the Presidency College. After a time private persons and quasi-public bodies purchased their bricks from the Government brickfield. The then intention of the Government in starting the brickfield appears to have been to ensure that the quality of the bricks manufactured satisfied the standard required for the construction. The price of the bricks was lower than what was offered in the market. The brickfield continued to be worked by the Government until 1921 when the manufacture was stopped and the factory was transferred to private hands. There is greater reason to-day for brickfields being started again under Government management. The Government appear to have sanctioned the establishment of brick, tile and cement product factories for ex-service personnel in some districts. We do not know whether these factories have been started or if any progress has been made. When private brick manufacturers put up the price of bricks in Australia, the Government started their own brickfields. We recommend that the Public Works Department may be asked to restart the manufacture of bricks. Standards for the quality of bricks can be set up and this will compel the private manufacturers to improve their quality and production.

140. There is no need to depend entirely on bricks for the construction of houses. In olden days houses were built of stone. In places where stone quarries are available use of stone should be encouraged in preference to bricks. Houses built of rough-dressed stones will result in the saving of both cost and labour. A survey of stone quarries should be made and the Government may set the fashion by using stones wherever available in the housing schemes.

141. *Tiles.*—This is akin to brick industry. A large tile industry has grown on the west coast. More than 50 big factories are engaged in the manufacture of tiles using clay from local silt deposits. There has been a fairly large export trade in Malabar and Mangalore tiles extending at one time up to Australia and Singapore. It is estimated that the value of annual outturn before the war exceeded Rs. 20 lakhs. We do not know whether the investigations so far made by the Geological Department have revealed the existence of such silt deposits in any other part of the Province. We would recommend that an investigation might be undertaken to find out the existence of such silt deposits so that similar factories might be started on the eastern half of the Province. Pending such investigation the production in the West Coast factories should be increased.

142. *Lime and sand.*—Lime and sand are available in plenty all over the Province and they do not call for any special remarks by us.

143. *Cement.*—We have dealt with the question of the production and supply of cement elsewhere. Sufficient quantities of cement will only become available after the new factories start production.

144. *Timber.*—In the Chapter on Forest Products we have made our recommendations for improving the supplies of timber for domestic and agricultural requirements. We have suggested there that standardized doors and windows should be made and offered for sale. Though timber is necessary for house construction, there is a tendency to demand only the known timbers like teak, venteak, pillamorudu and jack. Palmyra wood which was used as rafters and pillars has now gone out of use. Palmyra grows extensively in the districts of Tinnevelly, Madura, East and West Godavari, Cuddapah and to a lesser extent in Salem, Coimbatore, Kistna and Chingleput districts. Mature trees yield very durable timber which does not decay for a long period. We consider that palmyra timber can be used for cheaper construction after treatment. If the reserve forests also contain large quantities of palmyra, as we have reason to believe they do, the Government can introduce cut sizes of palmyra timber into the market for sale along with costlier varieties of timber.

145. *Iron and steel.*—Iron and steel is now in short supply. The demand for iron and steel for constructional purposes has increased of late owing to various causes, chief of them being the use of cement concrete. In the old type of construction very little iron and steel was used. Our building engineers should frame designs economizing the use of steel.

146. The materials that were being largely used in the construction of houses prior to the Second World War were steel and cement. Our building engineers and designers have got so accustomed to their use that in the absence of such supplies they feel helpless to construct houses. It should be possible to use locally available materials not only to build good houses but also to give them an appearance of modernity if so desired. Under present conditions a house with the prescribed minimum area of 340 square feet for a family will cost not less than Rs. 4,000 to Rs. 5,000 inclusive of the cost of land. The high cost makes it impossible for a great majority of the middle classes to own their houses. It should be possible to reduce the cost of construction considerably if investigations are made. We feel that a review of the materials used and of the method of construction should be undertaken by a committee of building engineers with a view to greater utilization of local materials and to effect material reduction in building costs.

(NOTE.—No estimate of the probable quantity of the Cuddapah slabs, slate, marble stone and clay available in the different districts is available.)

CHAPTER XIV.

CEMENT.

147. The cement industry is a well-established industry in this Province as in the rest of India. There are at present four factories in this Province for the production of cement. They are—

Name.	Original capacity in tons.
1 The Andhra Cement Company, Limited, Bezwada.	30,000
2 The Dalmia Cement Company, Limited, Trichinopoly	70,000
3 The Associated Cement Company, Kistna ..	80,000
4 The Associated Cement Company, Madukkarai (Coimbatore district)	180,000
Total ..	360,000

During the war period, almost the entire cement production was diverted for war purposes with the result that supplies for civilian uses were greatly restricted. In view of the great importance of this industry for war purposes and for civilian use, the Government of India have considered it essential to plan the further development of the cement industry on an All-India basis and to this end they have fixed the total target and its allocation to the several provinces. They have allotted the following two new units with a total capacity of 150,000 tons for this Province :—

	TONS.
India Cements, Limited, Tinnevelly	100,000
Rayalaseema Cement, Kurnool	50,000

Apart from this the Government of India have also allotted additional capacities to the existing factories mentioned above as under :—

	TONS.
1 The Andhra Cement Company, Limited, Bezwada.	70,000
2 The Dalmia Cement Company, Limited, Trichinopoly	150,000
3 Associated Cement Company, Kistna	100,000
4 The Associated Cement Company, Madukkarai ..	100,000

The Government of Madras were not satisfied that the allotment made would meet the demands of cement in the Province and they asked the Government of India to allot four more units for this Province, in order to produce sufficient quantities of cement required for the big irrigation projects under contemplation. We understand that the Government of India have now agreed to allot another unit of 100,000 tons capacity to be located at Kurnool for supply of cement to the Tungabhadra and Ramapadasagar Projects. If all the new units come into full production, the total

quantity of cement produced by these and the existing companies would amount to 1,030,000 tons, and this should be sufficient to meet the needs of this Province. The short supply is due to the pent up demand of the war years and should not be taken into account to judge the normal demand. We do not, therefore, consider that there is any immediate need for more cement factories to be established in this Province.

148. While on this subject we would like the manufacture of asbestos cement products to be taken up. There is a sizable demand for these products for industrial and public constructions. At present cement sheets are not manufactured in this Province but are imported in large quantities from Bombay and other places. Geological survey has revealed the existence of a quarter of a million tons of asbestos in the Cuddapah district; but only small quantities are being extracted every year. The manufacture of asbestos cement products could be taken up as a subsidiary industry by utilizing the cement and asbestos supplies available in this Province.

149. We are of the opinion that cement of the B.S. specification is not essential for construction of cheaper class of houses. We have elsewhere advocated the need to reduce the cost of house building by utilizing materials available locally. We have seen a report somewhere regarding the possibilities for the manufacture of non-standard cement which could be taken up anywhere with small units and at cheap cost. This might be worth investigating.

150. The manufacture of sorel or white cement from magnesite is another industry which is particularly feasible in this Province. We are at present importing this cement for use in making flooring tiles.

CHAPTER XV.

Paints and Varnishes.

151. In India the paint and varnish industry is concentrated at Calcutta and Bombay and the requirements of Madras including Southern States are at present met from these centres of production and partly by imports from foreign countries. There is negligible production within Madras Presidency by the firms shown in Appendix XVIII.

152. The Madras Province as compared to Bengal is more favourably situated for the manufacture of paints on account of her extensive deposits of raw materials such as barytes, red oxide of iron, yellow ochres, etc. Bengal has only one advantage over Madras in that she has an abundant supply of linseed oil.

153. The Panel Committee constituted by the Government of India on Paints and Varnishes has reported that the present production in India is about 50,000 tons and has recommended that the target of production may be fixed at 100,000 tons to meet

increased internal demands of the country for expansion and development schemes and also to meet any possible development of existing export market.

154. The imports into India are expected to continue and possibly on an increased scale in the form of specialized types of synthetic pigments and specialized types of paints in the manufacture of which India may not keep pace with advanced countries but the value of these imports could be balanced by exports of ordinary types applicable for general purposes.

155. No accurate data can be obtained on the requirements of Madras Province. But from information based on the sales of large business houses, it may be assumed that 6,000 tons valued at Rs. 75,00,000 are consumed annually in this Province including Mysore, Travancore and Cochin.

156. Calculating the probable increase in the demand on account of expansion and development schemes at 50 per cent of the existing demand, a target production of 9,000 to 10,000 tons for Madras will be desirable. The Panel Committee has recommended only a 15-ton per day production for this Province including Travancore and Cochin which works out to about 4,500 tons annually taking 300 working days a year. The estimated consumption of paint in the Madras Province, we feel, has been understated and we estimate a 30-ton per day production would be necessary to meet the demands. In the general recommendations of the panel, it is admitted that this industry should be as widely distributed as possible taking into consideration the availability of raw materials and the extent of the market.

157. A 5-ton to 10-ton per day production is considered as an economic unit and there is scope for about three units to be located in this Province. The Ceded districts which have an abundance of some of the natural pigments can manufacture general purpose paints to utilize the available materials. In consideration of the availability of power, raw materials and rail transport, Cuddapah may be selected as the centre, Madras which is a port could develop the manufacture of specialized paint as well as general purpose paints. It is learnt that Messrs. Addison & Co., Ltd., Madras, are contemplating a scheme for the manufacture of cellulose paints at Madras, which is a specialized industry requiring much technical skill and knowledge. We also understand that Messrs. Rayalaseema Paints, Limited, intend starting a factory for the manufacture of paints and varnishes in the Kurnool district.

158. The machinery required for the preparation of paints and varnishes includes Crushers, Filter Presses, Roller Mills Edge Runners, Ball Mills, Paint Mixers, Driers, etc. Some of these machinery are manufactured in India and some machinery has to be imported from foreign countries.

159. The paint industry does not consume much power and a 5-ton per day plant may require about 100 h.p. if raw materials are purchased in powder form. If raw materials are to be crushed in the factory about 200 h.p. will be required.

160. The capital outlay for a 5-ton per day unit plant will be about five lakhs. The necessary capital for a paint industry for the target production of 30 tons per day may be easily available within this Province.

RAW MATERIALS.

161. The paint industry requires hundreds of raw materials both natural and synthetic and no Province can be self-sufficient in the production of all the raw materials. Manufacture of synthetic pigments has to be regarded as a separate industry the development of which will depend upon the development of paint and other industries such as oil cloth, linoleums, rubber goods, artificial leather, plastics, ceramics, etc. The raw materials for paints cover a wide range which may be grouped as below :—

(*a*) Pigments.

(*b*) Drying oils and driers.

(*c*) Resins.

(*d*) Solvents and thinners.

The pigments impart colour, have rust inhibitive and protective properties and are classified on the basis of colour, origin and on the properties they impart to paints. Drying oils and resins form the medium which holds the fine particles of pigment evenly suspended and which after application forms a tough and adhesive solid binding the particles firmly to the surface painted. The driers are added to the oils to quicken the drying of oil-solvents and thinners as their names imply are used for dissolving the resins and for thinning paints.

162. *Zinc pigments.*—Lithopone which is a compound of barium sulphate and zinc sulphide is one of the important white pigments in the paint industry to-day. There is no indigenous production in the country. Barytes and zinc ore are the materials required for this product. Barytes which forms 70 per cent of lithopone is found in abundance in the Ceded districts and zinc ores could be imported from Malaya to start this industry preferably at Madras which is a sea port and which offers facilities for import of zinc ore, and for export of finished products if desired. We understand that a company has been floated with the Raja of Venkatagiri as its promoter to start the manufacture of lithopone in Madras.

163. There is at present an excessive production of second-grade barytes in this Province which is not absorbed by the paint industry in India and if lithopone manufacture is established this surplus production of second-grade barytes could be absorbed. The present requirements of lithopone in India is in the neighbourhood

of 4,000 tons but a production target of 10,000 tons could be aimed at to meet internal demand and also the needs of other countries. Manufacture of barium chemicals could also be developed as a subsidiary industry to lithopone.

164. *Titanium whites.*—These comprise of titanium dioxide and certain other complexes of this with gypsum and barytes in varying proportions. There is at present no production of these pigments in this country, although large quantities of illmenite and rutile are extensively available in Travancore State. The Indian paint industry could consume these to the extent of 3,000 to 5,000 tons annually if used as a substitute for zinc oxide and there is scope for Travancore State to take up this industry as it is of immediate importance.

165. *Lead pigments.*—White lead, red lead, litharge and lead chrome are the principal pigments made out of lead. Except for a few occurrences of low grade or lean deposits, India has no important lead deposits. At present India is manufacturing about 4,000 tons of lead pigments out of imported lead.

166. *Carbon black.*—This is prepared by burning waste coal tar or petroleum hydrocarbons. About 500 tons is at present consumed by paint industry in India.

167. *Aluminium powder and paste.*—There is a growing demand for aluminium paints and while India is at present consuming about 250 tons per year, there is likelihood of this demand increasing considerably. Aluminium paste which is a later development is manufactured out of aluminium powder by beating with a resinous product and is said to give better results than powder when mixed with oil medium. Travancore State which is setting up an aluminium manufacturing industry could develop this manufacture as a subsidiary industry.

168. *Pigments occurring in nature—Barytes.*—Barytes is the naturally occurring sulphate of barium widely used on account of its cheapness for increasing the bulk of paints. Cheap grades of paint are said to contain as much as 90 per cent barytes while the better grades contain about 40 per cent. The Ceded districts produce the bulk of barytes required for paint industry in India and it is a pity that while the Madras Province has a monopoly of this important extender as also some other naturally occurring pigments, the paint industry has not developed within the Province. Barytes is valued according to whiteness and while there is short production of good white barytes there is over-production of second-grade off-colour barytes. Research could be conducted to bleach the coloured barytes and the Government could entrust this work to the Indian Institute of Science, Bangalore. Successful development of the bleaching process for conversion of off colour to white barytes will go a long way towards enriching the resources of the Madras Province and particularly the Ceded districts.

169. *Whiting.*—Gypsum and white earths are largely used in the manufacture of " Putties " and water paints and distempers. Madras has abundant deposits of white earths in the Ceded districts and of gypsum in Trichinopoly district.

170. *Mica.*—Just as aluminium powder is used in paints pure muscovite finely ground is used for fire and heat resisting paints and ornamental paints. A large quantity of waste mica is available in Nellore district and could meet the full requirements of the paint industry. Grinders in Nellore district could take up the pulverizing of waste mica and meet the demands.

171. *Red and yellow ochres.*—Red oxide of iron and red ochres occur in abundance in Bellary district and Sandur State and are being largely exported to Bombay and Calcutta. These occur in varying shades and with varying contents of $Fe_2 O_3$ which are the determining factors for price. Some paint manufacturers care only for the shade while others care both for shade and for the $Fe_2 O_3$ contents.

172. Yellow ochres also occur in abundance in Kurnool, Cuddapah and Anantapur districts in varying shades from light yellow to deep yellow. Yellow ochre is a hydrated iron oxide with clay. This can be modified to red ochre by heating to dull red heat and the transformation takes place with removal of combined water. The present production of yellow ochre is being utilized for distempers mixed with lime for yellow water painting of buildings. Levigated yellow ochre fetches a better price and will be more useful for paints but this process is not done by any of the producers here.

173. By far the greater bulk of general use paints are made of these naturally occurring pigments along with barytes as an extender and there is therefore a strong case for the immediate development of a paint industry in the Ceded districts.

174. *Green pigments.*—In recent years chromium oxide has assumed importance as a green pigment because of its great opacity and resistance to sunlight. Small quantities of chromium oxide are being manufactured in India by some firms and there is considerable scope for developing the manufacture of same since the raw material dichromate is produced in large quantities in India.

Naturally occurring green earths if available in good shades could be used as green pigment.

175. *Blue pigments.*—Ultramarine blue and prussian blue are used for blue paints. While prussian blue is being made in India in small quantities the manufacture of ultramarine blue is not yet successful. Ultramarine blue is also used in laundry work and in paper manufacture and its manufacture requires investigation.

176. *Graphite paints.*—Graphite which is pure carbon has great opacity and spreading power and is used by itself or in combination with other pigments principally in paints for metals. Low-grade graphite occurs in the Circars and its utility for paints requires investigation.

177. *Lake pigments.*—Lake pigments form an important class produced by precipitating an organic or synthetic dyestuff on a mineral base. Pigments in a complete range of colours are now made by this method. At present some lake pigments are made in India with imported dyestuffs and there is considerable scope for expansion of this industry.

178. *Drying oils and driers—Drying oils.*—India is one of the principal producers of linseed in the world, its production being of the order of 400,000 tons per year about a half of which is exported. India produces therefore more than its own requirement of this important drying oil for paints. In South India, Hyderabad State produces some quantity and could meet the demands of the paint industry in Madras. The Ceded districts also grow some linseed and it is expected that the acreage under linseed will increase with the development of paint industry.

179. Castor oil is not a drying oil but when dehydrated loses weight and develops excellent drying properties. The use of dehydrated castor oil in paints and varnishes was developed recently and this can be adopted in the Madras Province since our castor oil resources are very large.

180. The use of tobacco seed oil and cashewnut oil as drying oils for paints requires investigation and research since the Madras Province produces large quantities of cashewnut oil and to utilize the large quantities of tobacco seed now thrown out as waste in Guntur district. Tobacco seed oil is said to take about two and a half times the period for drying and cashewnut oil is said to take about twice the period for drying as compared to linseed oil. A small paint factory at Bezwada claims to have perfected a process for converting tobacco oil into a good drying medium. The Committee visited the factory and saw samples of paints mixed with this oil being manufactured. The resultant cake is considered to possess good manurial properties.

181. *Driers.*—The important driers in general use for the purpose of accelerating the drying property of oils are, lead compounds, manganese compounds and organic compounds. It is assumed that many of these driers are produced in India at present.

182. *Resins.*—Lac resin is an important raw material for the paint and varnish industry. The annual production of crude lac in India has been estimated to vary between 30,000 tons to 40,000 tons, a large proportion of which is exported from India. A number of resin factories are working successfully in Northern India and are meeting the full requirements of the paint industry.

183. In addition alcohols and their esters are largely used in varnish industry to the extent of about 1·2 lakhs gallons per year Methyl and ethyl alcohols are solvents for shellac while butyl and amyl alcohols and their acetates are required in the formulation of cellulose lacquers. Butyl alcohol and acetic acid are now manufactured only to a small extent in India. The production of these by fermentation of molasses and by manufacture from alcohol requires immediate attention since large quantities of molasses are wasted by sugar factories.

Extract of the Recommendations of the Panel on Paints and Varnishes.

"For the extra production of paints and varnishes we recommend that two units of 5 tons per day plant should be installed in the Madras Province among other Provinces."

CHAPTER XVI.

CERAMICS AND REFRACTORIES.

184. This is another industry like the glass industry for which immense potentialities exist in our Province. If properly developed, we can command a large export trade in these industries. The raw-materials necessary for these industries are found in abundance in our Province. They are: various kinds of clay, including fine china clay, magnesite, felspar, etc. The ceramic products may be classified as follows:—

Terra Cotta goods which include indigenous pottery, roofing and flooring tiles, bricks, etc.

Stoneware including salt-glazed stoneware such as drainage pipes, sanitary ware, jars, etc.

Porcelainware including table china, electrical insulators, lamp shades, etc.

Refractories including fire-bricks, silica bricks, magnesite bricks, etc.

185. *Terra cotta goods.*—The manufacture of flooring tiles and roofing tiles has been largely developed in our Province, so much so, the term "Mangalore Tiles" has come to be associated with a particular pattern of roofing tile much in vogue throughout India. The industry, at present, is mainly concentrated on the West Coast, where deposits of suitable red clay are found in abundance. For some reason or other, except for a few factories, the industry is not developed in other parts of the Province. Suitable clay for making these tiles is available, for instance, in the South Arcot district and in some of the other districts as well. As these roofing tiles are essential for the building industry, the factories producing them should be located all over the Province. At present, the building industry except in Malabar has to bear the high cost of transportation involved in procuring supplies of these tiles from the West Coast. We have a suspicion that the main reason for the non-development of this industry in other parts of the Province is

due to lack of information about the availability of suitable clay. We would suggest that the Geological Department may be asked to make a survey of the other districts in this Province for deposits of such clay. The results of their investigation should be published and popularized, so that private enterprise to manufacture these tiles may be forthcoming.

186. *Stoneware.*—At the present moment, there are only two factories which are manufacturing stoneware. Of these, one is under the management of Messrs. Parry & Co., Ltd., where they have been manufacturing for some years acid-proof jars as well as other jars. Another is engaged in the manufacture of pipes for underground drainage and the factory is located at Tiruvellore. Closets in stoneware can also be made, but for some reason, they are not being manufactured in our Province. They are now being imported from Calcutta. There is bound to be a large demand for stoneware pipes and sanitaryware in connexion with the extensions of underground drainage in municipalities. We do not think that one factory is capable of supplying all the requirements of our Province. Our recommendation in this branch of industry is that one or more factories for the manufacture of stoneware in connexion with drainage schemes or sanitary installations should be undertaken by the Government, as the chief consumers are likely to be public bodies. We would recommend that for the location of the factories a suitable place in the South Arcot district where red clay is found and also one in the Andhra districts wherever such deposits are available may be selected.

187. *Porcelainware.*—Our Province has been importing considerable quantities of chinaware especially for table use from Japan and other countries. During the war period when supplies were cut off attempts were made both in our Province and in the States of Travancore and Mysore to make china tableware. But the products of these factories have been very poor in quality and they do not stand any chance of finding a market once imported goods are freely available. The ceramic works under Parrys are also making chinaware and they are of fair quality. The Government of Madras have just started a factory in Nellore district. In this branch of industry, the chief difficulty appears to be lack of technical direction. The manufacture of chinaware can also be taken on a cottage industry basis as is being done in Japan. In our opinion, it is not possible to improve the products of the existing factories unless technical skill is imported into the Province. As the Government themselves are interested in a factory, we would suggest that they procure the services of some Japanese experts experienced both in factory as well as cottage production for the purpose of establishing the industry on right lines.

Another branch of the procelainware industry is that relating to the manufacture of insulators, and parts of electrical accessories such as switches, lampholders, etc. While high tension insulators may require costly equipment, there may be no difficulty in

manufacturing low tension insulators and parts for electrical accessories. This could be undertaken in the projected factory at Nellore with the co-operation of the Electricity Department. Here again, the Government themselves would be large consumers, and it is only right that the industry should be under Government management. A third branch of the porcelain industry is that relating to the manufacture of tiles and higher class of sanitary-ware such as closets, wash basins, etc. At present, these materials are being imported from foreign countries. Their use in our homes is rapidly becoming popular. An industry for the manufacture of these would not require very heavy capital though a great deal of imported equipment may be necessary. We would recommend the establishment of such an industry under Government encouragement as a short-term plan.

188. *Refractories and special ceramicware for industries.*— In the manufacture of refractories, probably the best materials are available in the Madras Province. The South Arcot district is rich in fire clay and we believe that some of the fire-bricks made out of that clay is being supplied to other Provinces. But the industry itself is in the hands of non-technical people and has not been developed on proper lines. Another branch of refractories is the manufacture of magnesite bricks. Here again, they are either imported from foreign countries or from Bengal. The raw material is available in plenty in the Salem district and in view of the demand for such refractories for smelting works all over the country, it may be possible to start as a commercial proposition a large scale industry for the manufacture of refractories suitable for all grades of temperatures. This is an industry which should be started under private enterprise if same is forthcoming.

Extract of the Recommendations of the Panel on Refractories and Ceramics.

"We visualise, however, the possibility of the manufacture of special types of high priced refractories—Magnesite refractories—in South India where raw materials, viz., magnesite and cheap electrical power are available."

CHAPTER XVII.

GLASS.

189. The Panel Committee on glass appointed by the Government of India have reported on this industry, and it is not necessary for us to go into the details here. Glassware may be classified as (1) bottleware, (2) sheet glass, (3) hollowware such as tumblers, lamp chimneys, etc., (4) pressedware and fancy goods, (5) scientific glassware and (6) optical glass.

190. Bangles form a separate class as their manufacture is more or less of the nature of a cottage industry. Bangles are generally made out of broken glass and therefore do not depend upon any elaborate equipment or on a variety of raw materials for their manufacture.

191. There is no reason why the glass industry should not develop largely in the Madras Province. The raw materials necessary for glass manufacture are either already available or will soon become available. They are sand, quartz, soda-ash, felspar and lime. Recent experience has proved that fuel oil can be used for smelting. We need not depend upon supplies of coal. A feature of the glass industry is that its economics are governed largely by its nearness to the consuming market. Its bulk and its fragility requiring elaborate packing, are important factors in its cost if it is to be transported over great distances.

192. There are a few factories in the Madras Province making bottleware and hollow glassware. There is, however, no factory for making sheet glass in the Province. We are not aware that any serious attempt is being made to start such a factory. We recommend the immediate establishment of such a factory which may also engage itself in making mirrored glasses. The main defects of the existing glass industry in the Province are their obsolete methods of manufacture. While the glass industry was able to meet the demands of the local markets in some measure during the war-period, its products have now been replaced in the market by the better products of foreign origin. The glass industry has been developed very largely in the United States, and any local industry if it is to satisfy the standards of quality demanded by the consumer must adopt modern methods of manufacture. Otherwise, the chances of survival of the existing glass industries are precarious. Besides the small industries in the Province, there are two medium sized factories under the management of Ogales, one in Bangalore and another in Travancore. While the products of these factories may meet, to some extent, the consumers' needs in the interior, a large-sized factory on up-to-date lines situated at Madras will not only be able to meet local demands but would also be in a position to export to markets in the East, such as Burma and Malaya. We do not see what part the Government can play in establishing the glass industry on sound lines in our Province unless sufficient private enterprise is forthcoming. All that we can recommend is that if any industry stands in need of financial assistance from the Government, it may be given. We are, however, informed that there is lack of data on the availability of sand and quartz necessary for this industry. If that be the case, there will be no use asking the glass technologist of the Government to undertake an investigation of the resources of raw materials. Such work can only be satisfactorily done by the Geological Department. To-day, the output of the glass industry is restricted by the short supply of soda-ash. We have already made recommendations elsewhere about the manufacture of soda-ash in this Province. We see a great future for the glass industry in this Province, provided sufficient enterprise is forthcoming and the industry is developed with the assistance of American or European equipment and technical personnel.

193. The manufacture of optical glasses is not emphasised very much by the Panel Committee. We, on the other hand, feel that this industry has a great future. Use of optical glasses is not necessarily confined to the manufacture of scientific instruments but is also necessary for the spectacle industry. The spectacle is a common man's need and with the spread of literacy the demand for spectacle glass should be very great. This industry, again, can be started with a moderate amount of capital anywhere where pure quartz is available.

194. Our final recommendations as short-term propositions are the establishment of a plate glass industry near about the City of Madras and the modernization if possible of the existing factories making bottleware and holloware.

195. The manufacture of bangles, as we have said, is a cottage industry and is strictly speaking beyond the scope of our report. Considering that there is a large demand for glass bangles in our Province and that the manufacture of these is simple requiring only artistic skill, we suggest that the Government may ask the appropriate authority to take steps to encourage the establishment of this industry.

Extract of the Recommendations of the Panel on Glass.

"In Southern India, the glass industry is comparatively less developed. Manufacture of lampware, tableware, pressed ware and sheet glass should be developed in this region where raw materials are easily available."

CHAPTER XVIII.

Heavy Chemicals.

196. It is needless to emphasize the importance of the heavy chemical industry as a part of the industrial advancement of any country. These heavy chemicals are essential for other industries like textiles, soap, glass, leather, fertilizers, etc., and the success of these industries depends to a large extent on the availability of heavy chemicals at reasonable prices. The index of the industrial development of a country is usually judged by the amount of heavy chemicals consumed. Judged by this standard, India is far behind other countries and, of the provinces, Madras occupies a very insignificant place. The following two statements illustrate the position :—

Statement I.

Per capita consumption.

	Sulphuric acid.	Soda ash.	Caustic soda.
	LB.	LB.	LB.
India	0·33	0·6	0·30
United Kingdom ..	44·8	..	..
United States of America.	113·0	56·0	19·4

STATEMENT II.

Province.	Percentage of population in 1941 to the total for India.	Percentage of workers in the industry in 1939.	Location Factor.
Baroda	0·7	31.6	4.5
Bengal	15.5	47·7	3·1
Mysore	1·9	4·9	2·6
Bombay	5·4	5·8	1·1
Punjab	7·3	2·8	0·4
United Province.	14·1	2·3	0·2
Madras	12·7	0·5	0·04

The use in India of the three important heavy chemicals, let alone their production, sulphuric acid, soda ash and caustic soda is comparatively little. The Panel Report on Heavy Chemicals defines them as chemicals that are produced in large quantities usually at low cost and serve as raw materials or treating agents for other process industries. A comprehensive list of heavy chemicals is given in the appendix to the Panel Report. While every heavy chemical has a bearing on the industrial activity of one kind or another, we shall deal only with those heavy chemicals whose relative importance is greater for the industrial development of the Province and for the manufacture of some of which at least Madras possesses facilities.

197. *Sulphuric acid.*—The entire production in India of sulphuric acid is very small though every important industry is directly or indirectly dependent to some extent at least on this acid or its derivatives. Out of the production of 59,000 tons of sulphuric acid in India, Madras produces only 1,690 tons at the factory of the East India Distilleries and Sugar Factories, Limited. We understand that an import licence has been granted to a Nellore firm for one 35-ton gypsum sulphuric acid plant. When this plant is installed it is estimated that about 10,500 tons of sulphuric acid will become available. In the neighbouring States of Mysore and Hyderabad there are plants which produce about 4,170 and 160 tons, respectively. The Travancore Fertilizers and Chemicals, Limited, Alwaye, which has just commenced production has an estimated capacity of 75 tons of acid per day. Out of this, 50 tons will be consumed by the sulphate of ammonia section of the factory and 7 tons by the rayon factory. The balance of production is expected to be consumed locally.

198. As the manufacture of sulphuric acid is recognized as the basis of all chemical industries and as the demand for the acid is bound to increase with the development of textiles, rayon and

other industries, there appears to be a growing need for the development of the manufacture of sulphuric acid. Our estimated consumption of sulphuric acid is in the order of 18,250 tons. We do not know how far the Nellore concern has progressed with their project. The Ranipet Plant is reported to be of obsolete design and uneconomic in working. It is essential to instal another plant of 1 lakh tons capacity in our Province. It may be a remodelling of the Ranipet Plant with increased capacity or altogether a new plant at a suitable port.

199. Madras has no proved deposits of elemental sulphur. The plants now in operation in our Province and in States import sulphur mostly from Texas (U.S.A.). We understand that sulphur in elemental state occurs in Kona village near Masulipatam in Kistna district and that the Government have undertaken the chemical examination of the deposits to test their suitability for chemical industry. The area in which the sulphur deposits are located gets submerged under the sea during the monsoon season. What percentage and quantities of pure sulphur would be available and whether it would be economical to exploit the deposits are matters which require immediate investigation by the Government in view of our dependence on foreign countries for sulphur.

200. We need not entirely depend upon imported sulphur for the manufacture of sulphuric acid. Iron pyrites and barytes have about 50 per cent sulphur content. Large quantities of barytes are known to occur in the Ceded districts and whether the sulphur content of these could be availed of to manufacture sulphuric acid requires research. Again sulphur can be extracted from gypsum. Germany which has no deposit of pure sulphur is reported to have worked a valuable process during the Great War for the production of the acid from gypsum. The proposed Nellore Factory also contemplates the use of Nellore gypsum for the manufacture of sulphuric acid. Large deposits of gypsum of good grade occur in Trichinopoly and Nellore districts. In the Trichinopoly district the Geological Survey has revealed that the gypsum bearing area is about 22½ square miles and is estimated to have about 15 million tons of gypsum within a depth of 50 feet. The deposits near Sulurpet in Nellore district also cover a large area. We consider that if the sulphur deposits in Kistna district should prove fruitful and gypsum could be used in place of imported sulphur, it may be possible for us to manufacture sulphuric acid without resorting to import of sulphur.

201. *Alkali industries.*—Many of the industries such as soap, glass, paper and textiles are alkali users. There are other industries such as dyes, disinfectants, leather and even vegetable ghee which consume alkali in their manufacturing processes. Alkali industries are very important and form an essential section of heavy chemicals. We shall only deal with two of the most important alkali industries.

202. *Soda ash.*—Soda ash is an important chemical for several industries, chief of them being glass, soap, paper, textiles, ordnance factories, etc. The total quantity of soda ash consumed in India in 1944 amounted to 107,500 tons. The present consumption in Madras Province is difficult to estimate. The future demand for soda ash in this Province including the requirements for causticising for caustic soda, may be estimated at 100,000 tons which may be taken as the target. The Government of India have sanctioned the location of three plants in this Province as shown below :—

Name.	Capacity in tons.
	TONS.
1 The Link Chemicals, Limited, Tinnevelly district	30,000
2 The National Chemical (Alkalies), Limited, Guntur	30,000
3 The South India Chemical and Alkhali Corporation, Limited, Ramnad	45,000
	105,000

The chief raw materials required for the manufacture of soda ash are salt and limestone. These are available in close proximity to each other in the Tinnevelly district. Coke and coal will have to be imported. If these factories come into full production, they should be able to meet the demand of the market fully.

203. *Caustic soda.*—It is a matter of common knowledge that for want of caustic soda many industries have been forced to step down their production and some have even stopped their production altogether. The All-India production is estimated to be 12,600 tons while even the present requirements amount to 54,000 tons. We have therefore to depend mainly on the imports of this essential chemical. At present the Mettur Chemical and Industrial Corporation, Limited, is the only concern in this Province producing annually about 2,000 tons of caustic soda. The production is hardly sufficient to meet the demand even of the existing factories within the Province. We understand that the Government of India have announced their decision not to lay down the targets of production for this industry and also not to restrict the installation of more plants. The Mettur Chemical and Industrial Corporation, Limited, intend to duplicate their plant so as to double the production capacity of caustic soda. We understand that the Government have sanctioned the starting of two new factories for the production of caustic soda in the Tinnevelly district with a total capacity of 60 tons per day (18,000 tons per year). If these factories materialize we expect that the requirements of this Province for this chemical can be adequately met.

204. The electrolysis of brine and causticising of soda ash are the two methods of manufacture adopted in western countries though recently the electrolytic process seems to find favour. But the problem of finding use for chlorine obtained in an almost equal quantity by the use of the electrolytic process has to be solved. The use of chlorine has not been sufficiently popularized in this country. But the establishment of the paper industry and other industries will result in a greater demand for chlorine. The manufacture of insecticides such as D.D.T. and 666 if taken up will require supplies of chlorine. It is said 75,000 tons of chlorine will be required for the manufacture of 30,000 tons of D.D.T. and 22,000 tons of chlorine for 32,000 tons of 666. Water purification plants, glass, detinning, manufacture of titanium chloride, paper and the textile industry will also be consumers of chlorine. We would suggest that further installation of electrolytic alkali plants should be conditioned by definite schemes for the proper utilization of chlorine.

205. The Panel on Heavy Chemicals has observed as follows :—

" No country can afford to depend upon imports of this essential chemical. Consumer industries are well established in India and can easily be developed. We therefore consider it essential that caustic soda production in India should be stepped up as early as possible."

The margin of profit in basic chemical industries is always very low. At the present price of capital equipment it will be an uphill task to make these industries pay in the first few years. Their installation itself is doubtful on account of the large investment of capital required which Madras investors may not be able to furnish. They will require financial assistance from the Government and perhaps other concessions also if they should yield a reasonable return to the investors. The Government should be prepared to go to the assistance of these industries if they are anxious for their early establishment

[*A note on " Heavy chemicals " by Sri R. Suryanarayana Rao, M.L.C. and Janab M. Mohamed Ismail Sahib, M.L.A., is printed at the end of this Report.*]

Extract of the Recommendations of the Panel on Heavy Chemicals and Electrochemicals.

" Taking all the factors into consideration we recommend that one out of the four soda ash plants be located in South India, near one of the sea coast towns with a capacity of 30,000 tons per annum. Lime will have to be made from shells, coal and coke can be transported from Bihar and Calcutta.

For the balance of 2,000 to 2,500 tons of calcium carbide, we recommend that a plant may be put up in South India where electric power is available immediately, as in the jog area."

CHAPTER XIX.

Fertilizers.

206. In our Province we are faced with the problem of feeding a growing population with a stationary food production. We produce about five million tons of rice when eight millions would be required to feed the people according to nutritional needs. One of the ways of solving the problem is by increasing the yield from the land. What we take out of the lands in our Province each year as food crop can be expressed in terms of chemicals—nitrogen 886,000 tons; phosphoric acid 366,000 tons; and potash 905,000 tons. How these are to be replaced is the problem on which soil scientists are engaged. The five major nutrients of the soil are nitrogen, phosphorous, potassium, calcium and magnesium. Of these, it is only the first three that are considered difficult to replace. Our traditional method, as well as that of the rest of the world, till recently of supplying the deficiency has been by the use of manures. The use of fertilizers or artificial manures has become popular only within the last twenty-five years. While the use of manures has kept up the yield from land at the same level throughout ages, the use of fertilizers has increased the yield only during the last twenty-five years. The use of manures and fertilizers has to be considered from two aspects. Firstly as replenishments of nutrients of the soil and secondly as supplying the needs of the plant grown on the soil. Fertilizers while capable of supplying the mineral constituents of the soil cannot supply the humus necessary for the plant which manures alone can supply. Fertilizers and manures are therefore not competitive materials in any sense. They are complementary. Excessive or exclusive use of fertilizers is harmful to the soil as it may lead to acidity, destruction of humus and of the calcium content and may also render it less capable of retaining moisture. Under the traditional system of using farmyard manure, green manure and by holding, the nutritional balance and the texture of the soil have been kept up throughout centuries of cropping.

207. Once it is realized that fertilizers can only be complementary to manures, the danger of exhausting the soil by too liberal applications of fertilizers is diminished. But it must be borne in mind that the experience gained by the use of fertilizers is still immature. We are, therefore, of opinion that it is essential to formulate a scientific manurial policy for our Province. It should be based on investigations of the various kinds of soil found in our Province and of the crops raised thereon. The policy should formulate the kinds of fertilizers and manures which are suitable for wet and dry areas, for various types of soil, for different kinds of crops and also the proportion in which they are to be used. Some work has been done by the Government Agricultural Farms but we think they have been neither exhaustive nor complete. Nothing on the scale of experiments done at Rothamsted has been attempted in our Province. It is essential that those experiments should at

least be repeated under tropical conditions and for tropical food crops. We do not think that it is desirable to plan for the manufacture of fertilizers on a large scale without knowing what is really beneficial to the land. Use of particular fertilizers has come to be accepted in some parts of our country more by advertisement and propaganda than as the result of selection based on research and experience.

208. The Government of Madras have approved a five-year plan for food production commencing from 1947–48 to 1951–52. We are here concerned only with that part of the plan which refers to production of fertilizers. The Government have planned for a target consumption of 150,000 tons of ammonium sulphate in 1951–52 of which 100,000 tons will be used on the rice crop resulting in an additional production of 300,000 tons of paddy. For the phosphatic manures, the target is fixed at 60,000 tons in 1951–52 which applied along with 200,000 tons of groundnut cake and a sufficiency of green manure is expected to result in an additional yield of 180,000 tons of paddy. No target has been fixed with reference to the consumption of potassium manures. India commenced importing artificial manures in substantial quantities from about the year 1930, and the quantity imported has been steadily increasing until the year 1939 when war cut off further supplies.

209. The following synthetic nitrogen fertilizers are now being manufactured in various parts of the world. They are : Sulphate of ammonia, nitrate of lime, cynamide, nitro-chalk, urea and nitro-phosphate. Phosphatic manures manufactured as raw bones, bone-meal, steamed bone, ground rock phosphates, super-phosphates, and basic slag. Potassium manures manufactured are crude salt (kainite), sulphate of potash, muriate of potash and flue dust. We will now examine the raw materials available in this Province for the manufacture of synthetic fertilisers. In the nitrogenous group, we are not very fortunately situated. With reference to the manufacture of sulphate of ammonia the raw materials required are either gypsum or sulphur and coke or wood fuel. The Fertilizers and Chemicals at Alwaye, in which the Government of Madras have an interest are using wood for making producer gas in place of coke. But the economics of the use of wood have still to be ascertained. Anyway we cannot in our Province attempt such a process as we have not a sufficiency of forest area, to supply the necessary quantities of wood, though we have large quantities of gypsum. The Government of India plant at Sindhri will be using coke which is available near the factory site. Sulphate of ammonia is also a by-product of the iron smelting industry. Our first difficulty, therefore in the manufacture of sulphate of ammonia is lack of wood or coke. While a factory for the manufacture of sulphate of ammonia cannot be considered as a commercial proposition there is nothing to prevent the Government from setting up a factory in our Province, the loss in working being treated as subsidy to agriculture. On the other hand a plant for the manufacture of nitro-chalk

(ammonium nitrate) or urea if free from technical difficulties may be an economic proposition. Here, the process is largely a derivation of nitrates from atmosphere mainly by the use of electricity. But there is some difference of opinion as regards the value of sulphate of ammonia and ammonium nitrate as fertilizers.

210. Coming to the phosphatic manures, we have some supply of bones available in this Province at various centres for the manufacture of bone-meal, etc., and we have also some quantities of phosphatic nodules in the Trichinopoly district and of the mineral appatite in the Vizagapatam district. For the manufacture of superphosphates it is necessary to have large supplies of sulphuric acid the manufacture of which again depends either upon imported sulphur or on the use of gypsum. We may, therefore, say that the feasibility of manufacturing phosphatic manures as a commercial proposition depends largely upon our plans to manufacture large quantities of sulphuric acid. New processes for manufacture of superphosphates from nodules without the use of sulphuric acid have been discovered. How far they have been perfected or are feasible in our Province we cannot say.

211. The manufacture of potassium manures curiously enough is being neglected in our country. We have not a large deposit of natural potash as in Germany but we have alkali earths in some places in our Province and the sea is of course the greatest store for our supplies of potash. If the process of salt manufacture is done on scientific lines it is possible that we may be able to derive substantial quantities of potassium salts. The causes that have led to the poor fertility of our lands may be traced to the fact that we have been cultivating the same lands for thousands of years and also that within the last two or three decades we have been exporting large quantities of oil-cakes which are valuable manure and cattle food. Preponderant opinion however is that it has become necessary for us to supplement our natural manures by application of synthetic manures. We are therefore of the opinion that the question of establishment of industries for the manufacture of synthetic fertilizers should go hand in hand with schemes for increasing the production of natural manures. The present methods of making farmyard manure are often faulty resulting in the loss of its mineral constituents. We wish to impress upon the Government that there is considerable danger in promoting the establishment of fertilizer factories and in encouraging the use of synthetic fertilizers basing it merely upon the feasibility of starting such industries. The formulation of the manurial policy which we have recommended at the outset must be done by a committee of agricultural experts and soil chemists. On the basis of their recommendations, we should investigate the possibilities of manufacturing such synthetic manures as would be suitable for use in the lands of our Province. The location of the industry would depend to some extent upon the nature of the synthetic fertilizers required in the area. No synthetic fertilizers should be allowed to be sold

in places where they are unsuitable. Considerable propaganda would be necessary to teach the ryot the right use of artificial manures. We do not therefore confine our recommendations to the manufacture of any one fertilizer. It will be necessary to manufacture at the same time nitrogenous, phosphatic and potassium fertilizers. For this purpose a survey of the raw materials is essential. What particular fertilizer should be manufactured in each group would depend upon our manurial policy. The early manufacture of fertilizers is no doubt very urgent. We would, therefore, recommend to the Government the immediate construction of a committee of experts to determine a scientific manurial policy for this purpose.

[*A note on "Fertilizers" by Sri R. Suryanarayana Rao, M.L.C., and janab M. Mohamed Ismail, M.L.A., is printed at the end of this report.*]

CHAPTER XX.

Fine Chemicals, Drugs and Pharamaceuticals.

212. These are grouped for convenience of treatment under one head though in fact they represent a number of specialized industries. So far as these industries are concerned, considerations of proximity of raw materials, cheap power, and machinery are very minor factors in their establishment. Their development mainly rests on there being sufficient private initiative to start them and a sufficient number of chemists specializing in their manufacture. Madras has again unfortunately lagged behind other provinces in developing these industries. One or two factories started some two decades back came to grief for lack of finance and managerial ability. Anyway, to-day conditions are favourable for starting these industries. The Madras Province has supplied chemical firms in other parts of the country with research chemists and chemists who have specialized in the manufacture of particular drugs and chemicals. The capital required for these industries is not of a very large size. We feel, therefore, that except for lack of initiative from industrialists of this Province there is nothing to hinder the development of these industries in our Province.

213. We will attempt here only a rough classification of these industries. It is not possible to suggest a list of the industries which could be started as a committee like this is incapable of compiling such an exhaustive list. One group may take up the manufacture of chemicals like sodium bicarbonate, magnesium sulphate (epsom salts), potassium bromide, citric acid, tartaric acid, compounds of mercury, arsenic, antimony, iron and zinc, sodium and acety salicylate, calcium, lactate, calcium gluconate, antacids, etc. Another group could take up the manufacture of caffeine, tannic acid, glycerine, quinine, santonin, emetine, ephedrine, strychnine, balladona, morphine, pyrethrine, menthol, etc. A third

group of industries could take up the manufacture of pharmaceuticals of animal origin such as liver extract, pituitrins, thyroid, insulin, shark liver oil, etc. A fourth group can engage itself in the manufacture of glucose and all the vitamins including yeast. A last group could take up the manufacture of other biological preparations such as vaccines, sera and penicillin, etc.

214. The sources of raw material for the first group such as sodium salts and iodine can be recovered in the process of refining salt. The citrous fruits can furnish the raw materials for tartarates and citrates. The others are the results of chemical reactions.

215. For the second group, the raw materials are to some extent found in our forests either naturally or in cultivated areas. There is one very important drug for which we do not have the raw material in our Province; that is digitalis. This plant we believe is only grown on the hills of Kashmir. We do not know if any attempt has been made to grow it either on the Nilgiris or the Palni hills. We would recommend the cultivation of medicinal plants in selected areas in our hill stations so that we can make ourselves more or less independent of supplies of raw materials from outside in respect of the more important of these alkaloids. At one time, India had the monopoly of quinine supplies. But the policy under the British Administration has led to a state of affairs when we have to depend upon imported supplies of quinine as our plantations have become neglected. It is important that the Government should take up the extension of the area under cinchona cultivation as the problem of combating malaria is of paramount importance not merely to this Province but to the whole of India.

216. Considerable research in the preparation of liver extracts and other extracts of animal origin has been done both in the Institute of Science and the Haffkines Institute at Bombay. There are to-day a large number of chemists who have familiarized themselves with the process of manufacture on a laboratory scale. It only remains to translate the experience gained in the laboratory to production on a factory scale. Animal products are available in the slaughter-houses of our Province which are under the control of the Health department. It should be possible with the co-operation of the Government to collect them fresh and transport them to the factories in refrigeration vans. The manufacture of these products presents no technical difficulty except that great care should be taken in the selection of the raw material and a high measure of cleanliness should be ensured in the manufacture of these products. Machinery for the manufacture of these products is being quoted by American manufacturers. In the event of private enterprise not forthcoming to take up the manufacture of these products, we would suggest that the Government should take it up in a large way. A great portion of the medical relief in this Province is administered by the Government institutions rather than by private practitioners. It is, therefore, essential that these

products should be available in all Government hospitals and dispensaries at prices within the easy reach of the poorest patient. In our view, it is of extreme importance that the manufacture of these products should be started very early and, as we have said if private enterprise is not forthcoming, Government themselves must embark upon the enterprise not even as a short-term measure but as an immediate proposition.

The Government of Madras are to-day engaging themselves in the manufacture of shark liver oil and adamin. These products are sold more in bulk to manufacturing chemists than in small packages for consumption directly to the public. Possibly, the preparation of shark liver oil requires some further processing to make it more palatable to the normal taste. In the matter of Adamin, we have seen from the Administration Report of the Department of Industries that on account of their large packages, they are unable to compete with the imported products like Adexolin, etc. A committee of medical men should be constituted to advise Government on the preparation of these products in a form in which they can be used largely by the public.

217. The manfacture of the entire range of vitamins in our Province is also extremely urgent. We are to-day importing large quantities of these products from foreign countries and some of them do not even possess the potencies claimed for them. The raw materials for the manufacture of vitamins are to be found partly in our food products and there is no need to import any special raw material. Here again we feel that if private enterprise is not forthcoming to take up their manufacture, the Government themselves should undertake them. We have recommended in the chapter on the by-products of the sugar industry the manufacture of yeast. The manufacture of the entire range of vitamins may be undertaken along with the manufacture of yeast by the Government.

218. In the manufacture of vaccines, sera and other injectibles Madras has made considerable progress. The King Institute in Madras is largely manufacturing these and has supplied other parts of India in times of emergencies with vaccines and sera. We would recommend the expansion of the King Institute either at its present place or elsewhere in order that the entire demands for these injectibles may be met by one central institution.

219. The importance of the industries described in this chapter cannot be exaggerated, serving as they do to maintain the health of the people of the Province. We have had occasion more than once to observe that there is a danger of industries under private enterprise falling off from the standards required of their products. While in respect of other industries the failure to maintain standards will only affect the stability of the industry, in the case of pharmaceuticals, it is bound to have an adverse effect on the consumers of their products. It is, therefore, essential that these industries which are operated by private enterprise should be under

the strictest scrutiny and the Government should exercise the greatest control over them to see that their products satisfy all the tests required of them. This would involve the Government in the organization of a big department consisting of chemists and administrative staff. To our mind, it would therefore be simpler for the Government themselves to undertake the manufacture of these products especially of those products where purity and potency are very important factors. When our industrialists have learnt the value of tradition, the Government may hand over the industry, if they so think fit, to private hands. In any event, industries under this category should be licensed and only those people who have proper equipment and personnel should be allowed to start them.

Extract of the Recommendations of the Panel on Fine Chemicals, Drugs and Pharmaceuticals.

"Extraction of shark liver oil industry is being done under quite primitive conditions in the Madras Province and the oil loses a considerable amount of its potency and acquires a very unpleasant taste or odour. We feel that urgent steps should be taken to put the industry on a better basis."

CHAPTER XXI.

Soap.

220. Before the advent of soap in India, she had her own cleansing agents of vegetable origin such as soapnuts, seekai, gram-flour, etc. With the impact of Western civilization on India, soap is being increasingly used in this country. To-day, it is an essential article in the households of the rich and the middle classes. The soap industry is coming into prominence and requires special notice.

221. The earliest attempt made in this Province to manufacture soap on a regular factory basis was the establishment of the Kerala Soap Institute by the Madras Government in 1916. The growing demand for soap was being chiefly met by imports which were valued at more than Rs. 2 crores in 1920–21. In 1930, the swadeshi movement gave an impetus to the development of the soap industry, and as a result there had been a gradual decrease in the imports. The indegenous production was stimulated during the recent war and the productions of soap in India is computed at 140,000 tons in 1944. So far as this Province is concerned, except for a few small factories, production is largely carried on in a number of small establishments of the nature of cottage industries all over the Province. Except for the production by the Kerala Soap Institute which is about 700 tons per annum, the figure for the total production in this Province is not available. The average annual import of soap of all kinds into this Province for the eight years ending 1937–38 was about 1,492 tons. The average quantity produced by the Kerala Soap Institute, Calicut, during the same period works out to about 218 tons. Ignoring the production from other small units, we may safely assume that the average annual

consumption was about 2,000 tons per annum. During recent years the consumption of soaps appears to have considerably increased. The present per capita consumption of soap in India has been estimated approximately at about 12 ounces per annum, the lowest for any country in the world except China. The following table shows the world averages of consumption of soap for 1937-38 :—

Name of the country.	Average per head per annum.	Name of the country.	Average per head per annum.
	LB.-OZ.		LB.-OZ.
United States of America.	25— 0	Great Britain	20— 0
		France	20— 0
Holland	24— 0	India	0—12
Germany	2.— 0	China	0— 2

The oil and soaps panel have examined the scope and the extent of development of soap industry and have come to the conclusion that the target for the next five years should be fixed at a minimum of 300,000 tons per annum apportioned among the different categories as under :—

	TONS.
Toilet soaps	30,000
Industrial soaps	15,000
Household and laundry soaps ..	255,000
Total ..	300,000

With this target, the per capita consumption will amount to 1·53 lb. Though the panel has not allotted any target for Madras separately, we can take it at 24,000 tons per annum on the above per capita basis. Deducting the quantity produced at present, this Province will have to produce 23,000 tons more of soap of all kinds.

222. In this Province, some new concerns have been permitted to start factories for the manufacture of soaps. Of the seven vegetable ghee factories, some are proposing to manufacture soap as a subsidiary industry. There is no definite information as to the capacity of plants proposed to be installed by these concerns. At any rate, if the target allotted to this Province is to be reached, it will be necessary to start some more units for the manufacture of soaps.

223. In making this recommendation, it should be understood that we do not favour the expansion of the industry if the present formula for the composition of soap is adhered to. The principal raw materials required for the soap industry are oils, foots and tallow, caustic soda and essential oils. We are not competent to advise on the proportion of the different raw materials that should be used for making good quality soap. So far as we are aware, large quantities of coconut oil are used in soap manufacture. If,

as the Panel has recommended, new factories have to be set up to produce additional quantity of 23,000 tons of soap, it would mean a consumption of about 8,000 tons of coconut oil by the industry. Large quantities of oil with a high food value will be diverted for soap manufacture besides putting up the price of oil. The Indian diet is already poor in fatty foods and it is of primary importance that edible oils should not be utilized for these purposes but other substitutes such as Mohwa oil, tallow or cotton seed oil should be used. There is no information as to the quantity of Mohwa oil at present available in this Province. The Government have, however, taken action to increase the cultivation of Mohwa trees wherever possible. We do not doubt that when the industry creates a regular demand for this oil, supplies will be forthcoming.

224. Cotton seed oil is totally neglected in India. The total available quantity of cotton seeds is nearly two million tons but the quantity crushed for oil is negligible. Almost the entire quantity is used as cattle food. Thus the bulk of the seeds containing 18 to 22 per cent oil content and a potential source of an important industrial oil is lost to the country. The crushing of cotton seeds may present some difficulty, principally in the removal of linters and husks. It has not attracted the attention of the millers owing to its high cost. We consider that the economics of production of cotton seed oil and the use of the several products such as linters and cake should be carefully investigated and necessary data made available to the millers so as to encourage the crushing of cotton seeds. A possible objection to this suggestion might be that the crushing of cotton seeds for oil may diminish its value as cattle food. The Panel Committee on Soaps and Oils has stated that the utilization of cotton seeds as a cattle food is " the most wasteful method of disposal of an essentially rich oil seed, as the seed is too rich in oil content to be fed to the cattle as such and a large amount of oil, which would otherwise be useful to the people of the country, passes out unassimilated." We assume, therefore, that the cotton seed cake even after the extraction of the oil will not lose any of its constituents as a good cattle food.

225. We agree with the recommendation of the Panel that the proportion of ' fillers ' or ' foots ' as they are called, in the composition of the soap should be limited to 7 per cent. At present more than about one-fourth of the quantity of the soap content consists of ' foots.' The Government of India contemplate bringing in legislation to restrict the proportion of ' foots ' in the composition of the soaps. This, we consider, is a step in the right direction.

226. Tallow also enters into the composition of soap up to about one-fifth of its content. We believe that most of the tallow used in the manufacture of soaps is imported from Australia and other places. If a larger proportion of tallow could be used without materially affecting the cost or the quality of the soap, there will be so much less of edible oils used.

227. The next question that arises for consideration in respect of this industry is whether the industry should be planned on a large scale basis or on a cottage industry basis or both. At present soap is manufactured in large factories and also on cottage industry basis. Although the process of manufacture is not highly technical, it may be difficult for small enterprises to compete with factory production. The demand for particular brands of soap is largely artificial in the sense that its popularity is chiefly built on publicity and propaganda than by its intrinsic superiority over other brands. It is for this reason that we feel that small scale cottage industries making soap will have no future. We would, therefore, advocate large scale production in this Province.

228. So far as the new factories that might be started for the production of soap are concerned, we consider that they should follow 'the continuous process' method in the manufacture of soap. We would suggest for the present one central factory of the latest pattern in the Province with a capacity of at least 25,000 tons. Its location may be left to be determined by the promoter who comes forward to undertake the project. The valuable by-product of soap industry, e.g., glycerine, is now wasted. Any new plant must include a glycerine recovery plant also.

Extract of the Recommendations of the Panel on Oils and Soaps.

"We recommend that the Provincial Government do take steps to collect and forward representative samples of cotton seeds grown in their areas to the United States of America machinery manufacturers for experiment and designing of suitable delinters of guaranteed performance."

"We would urge upon all the Provincial Governments the desirability of planting mohwa trees as avenue trees and round about villages in preference to other trees."

"We recommend that the Madras Government be requested to explore the possibilities of making available a larger quantity of sandalwood for distillation without detriment to continuous supplies."

"We recommend that the Government of Madras be requested to put a stop to this practice and to see that new trees are continually replanted in order to encourage the development of its essential oil."

"We recommend that the Provincial Governments should establish in the initial stage essential oil factories according to the availability of aromatic raw materials."

"We strongly recommend that Khus Oil industry will have to be established in the United Provinces, Punjab and South India."

CHAPTER XXII.

LEATHER AND LEATHER GOODS.

229. The leather industry is one of the most important industries and one already well established in South India. But it offers scope for considerable further development and improvement. This Province imports large quantities of raw hides and skins from other provinces which after tanning are re-exported as dressed skins to foreign countries. Although considerable expansion of the tanning industry has taken place and a network of tanneries

has sprung up, we have not fully developed finished leather and leather goods industry to any appreciable extent. Tanners are satisfied with the profit on export of tanned hides and skins. Some of these come back to us in the form of finished leather or leather goods. Considering the importance of this industry to our Province, the Government have thought it necessary that a complete examination of all the problems connected with the various branches of the industry commencing from the proper flaying of cattle in the slaughter-houses to the manufacture of various leather goods should be made. For this purpose they have appointed a committee consisting of officials and non-official members representing every branch of leather industry and trade to study the problems relating to the leather and leather goods industry and to make recommendations on the lines on which the industry should be developed in this Province. We expect that this committee's recommendations would soon be available to the Government and the public. We have, therefore, refrained from making a study of this industry. The Principal of the Government School of Leather Technology was examined, however, by us. A note on the industry furnished by him will be found in Appendix XVII to this report.

Extract of the Recommendations of the Panel on Leather and Leather Goods.

"We forcefully deprecate the export of the Madras tanned sheep and goat skins of better qualities from India and we suggest that the best selections of the Madras tanned goat and sheep skins and light calves should be retained in India for the Indian Fancy Leather Goods industry."

NOTE ON LEATHER AND LEATHER GOODS.

By Janab M. Md. Ismail.

Report says "Tanners are satisfied with the profit on export of tanned hides and skins"—lines 9 and 10.

I have to say here that the tanners are dealing only with the surplus quantity that is not being consumed and cannot be consumed at present within the country, owing to lack of sufficient demand for leather goods within the country. This surplus quantity has, therefore, to be sold to foreign countries to avoid waste of national wealth. Instead of only tanning or dressing this quantity it can indeed be finished in the country. But most of the foreign countries have got restrictions on the import of finished leathers and leather goods. Therefore, under the conditions prevalent up to the present, the tanners have mainly to confine themselves to tanning and exporting the said surplus quantity. They cannot help it.

Again, the next sentence in the report (lines 10 and 11) reads "Some of it comes back....." This gives an impression that a considerable quantity of our export comes back as finished articles. But the fact is not so. During normal times our export of skins and hides, raw and tanned, used to be worth about Rs. 20 crores

and the import of such articles as foot-wear, belting, etc., used to be only worth about one crore. Even taking these imported articles, all of them, particularly those like foot-wear, etc., have not been made exclusively of leather. The leather content of these articles would come to about *half a crore* as against our export of 20 *crores*. Further, such articles as belting, etc., are not made of the raw materials exported by us, as they are not suitable for such purposes. Therefore what comes back to us is a very small or negligible quantity.

CHAPTER XXIII.

TEXTILES.

230. The cotton mill industry is well established in South India there being 44 mills engaged wholly in spinning, and 10 mills engaged both in spinning and weaving. The location of cotton mills is, however, confined to a few places, such as Coimbatore, Madras and Madura. Under the post-war development programme 25 new spinning and weaving mills will come into existence in all the important cotton growing areas of the Province. The area under cotton cultivation in the Madras Province is 1,686,275 acres. The following table gives the varieties and output of cotton grown in the Province :—

	Acs.	Yield in bales.
1 Tirunelveli including Karunganni ..	552,267	131,450
2 Kambodia	315,882	149,710
3 Uppam	13,989	2,110
4 Nadam and Bourborn	1,215	60
5 White and Red Northern	109,456	13,000
6 Westerns	601,592	70,640
7 Warangal and Cocanada	87,528	15,780
8 Short staples	4,346	520
Total ..	1,686,275	383,270

The South Indian cotton is, however, of a short staple variety generally not exceeding 7/8th inch staple.

231. Judged by the present standards it would appear no great improvement in the consumption of South Indian cottons by the South Indian mills can be expected within the next year or two. In considering this question one will have to take into consideration the limitations imposed by staple character and other relevant spinning qualities of the cotton and the demand for those styles of cloth in which the coarser yarns find a place. An analysis is given below of the over-all production of yarn by the mills in the South zone from which it will be seen that South Indian growths

are suitable only for certain categories. No doubt, cottons spun under laboratory conditions may give a count considerably finer than what would be possible industrially. But this can be only of academic interest and cannot be treated as a business proposition.

(In 1,000s of lb.)

Centre.	Up to 10s.	11s to 15s.	16s to 20s.	21s to 30s.	31s to 40s.	Above 40s.	Total.
Madras	4,641	17,829	56,243	56,876	37,558	16,341	1,89,488
Cochin	..	..	1,043	1,127	528	1,162	3,860
Travancore ..	174	..	499	312	73	48	1,106
Pondicherry ..	1,049	3,995	3,482	2,095	..	..	10,621
Mysore	5,231	4,726	7,286	7,223	1,589	1,016	27,080
Total ..	11,095	26,550	68,553	67,633	39,757	18,567	2,32,155

NOTE.—The figures given here are taken from the Textile Commissioner's Bulletin (CST–18 Table XA). From out of this production there is only a limited appropriation for weaving by the composite mills. During the period of twelve months ending 31st December 1946, the weaving mills in the above areas consumed the undernoted quantities (Table XA, CST–18).

(In 1,000s of lb.)

Centre.	Up to 10s.	11s to 15s.	16s to 20s.	21s to 30s.	31s to 40s.	Above 40s.	Total.
Madras	542	12,597	7,431	4,659	5,498	1,318	32,045
Cochin	..	..	859	1,109	515	..	2,483
Travancore	..	..	473	296	70	47	886
Pondicherry ..	998	3,482	2,725	1,216	..	..	8,781
Mysore	1,132	3,764	5,118	2,251	1,066	1,022	14,353
Total ..	2,672	20,203	16,606	9,531	7,149	2,387	58,548

After providing the demand arising from the handlooms working in these areas, an appreciable quantity of yarn in the lower counts is available for export to other Provinces. On the introduction of the yarn and cloth controls in 1943, the Madras Province was declared a 'surplus' area for yarn and about 55 per cent of the surplus 'free' yarn was ear-marked for export to the rest of India.

232. A study of the foregoing figures will show that other factors being equal, Madras and the South generally will continue to have large quantities of yarn in the coarser counts available for export and unless other Provinces and States launch on a programme of self-sufficiency, Madras can look forward to supplying in part the rest of the country with these yarns.

233. The Post-War Planning Committee estimated in 1945 that the spindles in South India could give enough yarn to weave a total of 944 millions yards of cloth, both mill-made and handloom. To the existing spindleage will be added the new allocations of 496,000 spindles of which 325,000 will spin coarse and 171,000 fine. These new additions may not make any substantial

difference in the relative off-take of Indian cottons and South Indian cottons in particular. In the post-war period, people have come to prefer finer cloth to more heavy and durable types. Whether this preference will continue to be a feature in the coming years it is very difficult to say. We may more or less assume the demand for finer varieties will fluctuate with the fall or rise of the purchasing power of masses. Another consideration to be borne in mind is that with the present high cost of production, mill establishments themselves would switch over to production of finer counts where there is likely to be a better margin of profit. Our endeavour should be to improve on the present types and achieve a better staple, better uniformity, grading, etc.

234. It would be unwise to restrict the use of other Indian growths or of foreign cottons with a view to securing for the grower of the South Indian types of cotton an assured market from the mills situated in this area.

235. The minimum requirements of cloth have been estimated differently by various authorities which have been examining this question as part of the post-war planning programme. The average pre-war consumption in India was placed at 15 yards and for South India at about 13·5 yards per head annually. The allotment in terms of present day ideas is admittedly low and so, a higher *per capita* consumption figure has been suggested by the Indian National Planning Committee of 1939 at 30 yards per year. The Chairman of the Textile Control Board, on the other hand, had estimated a potential of 25 yards and submitted his Board's programme to that end. In discussing this question, it is desirable to divest one's mind of all extraneous and irrelevant considerations and forget the sharp reactions which have been noted as a result of the recent shortages which we have witnessed. Primarily, cloth requirements of an individual or a family are determined by their wage-earning capacity, the class to which they belong, the climatic conditions prevalent in the area, the nature of the work they do and other equally material considerations. After making allowances for the gradual change resulting from fashions, a coalescence of the old and the new adaptations arising from vocational and other needs, it will be found that India is wedded to its old ways still. Therefore, the problem of what styles to produce is not present in any acute form. It is rather more urgent to solve the problem of how soon we can step up production and to what extent.

236. To determine what the mills now working in the South and those projected over the next few years should produce, we have first to decide whether we are to be content with the heavier goods of yesterday, or if we should endeavour to satisfy the present need for finer things. The set-up as it is now in the South (as elsewhere in India) will permit of variations only within very narrow limits. With the incentive of higher margins of profit

offered under the control scheme, the mill-owners in India were able to effect changes only to a small extent as can be seen from the *Ad Hoc Committee's* report in 1947, the details being in millions of yards.

Year.	Below 36s warp	36s to 47s.	Above 48s.	Total.
1945	3895·334 yards.	539·996	252.259	4,687·589
1946	3221·660 yards.	520·284	260·843	4,002·787

Though from the view point of India's economy, there is a serious fall in production to-day, it still establishes the fact that changes in the productive capacity will only be within strict and accountable limits. Consequently, we have to increase not only our overall productive capacity, but also our spinnings of 40s and above, if we are to cater for the rising demand for cloth.

237. Without any radical change the mill industry in South India with the additions anticipated in the next year or two, can give only enough yarn to assure us of 18·8 yards *per capita*. The basis for this estimate is that the total yarn spun in South India to-day will enable cloth (whether mill-made or handloom woven) of 944 million yards to be woven which should give a per capita consumption of 14·8 yards. To this figure has to be added the anticipated production of the new units which together may give us sufficient yarn and cloth to increase the above allotment by a further four yards. It should be mentioned in passing here that the handloom industry may not absorb the entire quantity which the new units may produce. This statement may sound queer in view of the multitudinous representations made from time to time that the handloom weaver to-day is getting an inadequate allotment of yarn and that he has to go idle 20 days in the month. This agitation is the direct result of unlimited profits available in the handloom trade over a period in which mill cloth was in short supply, which in turn brought into existence a very large number of looms, all making clamant demands for more yarn. This inflated demand is only a passing phase and the end of it is within easy sight.

238. Exports have not been considered so far but exports are bound to play an important part in the future of our industries. With the temporary elimination of Japan and its tremendous productive capacity and with Great Britain and the United States of America suffering from the handicap of very high production costs in the matter of wages, India can successfully make a bid now to secure new markets. There is no reason why South India should not share in this windfall. The bulk of the goods exported by Japan before the last war were grey shirtings and the South Indian mills can readily secure this business provided they standardize the qualities and keep them at the same high level of perfection as Japan was doing. There is also a tremendous volume of export trade possible in Indian yarns to the Middle-east, the African coast, and other adjacent countries which are not industrially developed. An increasing provision may, therefore,

be made with safety for the overseas markets and our productive capacity should take into account this certain outlet.

239. The number of spindles in an economic spinning unit is determined by the counts of yarn spun and the number of "preparations" for which provision is made. In South India, a mill with 12,000 spindles is considered an economic unit but industrialists in the north have been of the opinion that no unit can really be economic when the spindleage is less than 25,000. It is fairly safe to go on our own experience and accept the lower figure for our spinning units, as in the past the South Indian mills have been able to hold their own against those of the north. Naturally the finer counts for an equal weight of production will require a larger number of spindles than the medium or coarse counts. In a combined spinning and weaving mill the number of spindles and the number of looms to be installed depend in turn upon the average count of yarn spun. It is usual to reckon on 30 spindles per loom where the average count is 20s and 40 spindles per loom or more as the count gets into the 40s range or finer. Actually in practice the layout is always planned ahead and follows closely the pattern of trade for which it is intended.

240. The further development of the industry in South India should fit into the All-India picture and no more lop-sided growth should be permitted. As conditions are to-day the south is dependent to a very large extent on Bombay and Ahmedabad for its essential requirements of mill-made cloth. This state of affairs should be remedied expeditiously.

241. *Location of the industry.*—The main considerations which prevailed with entrepreneurs in locating this industry so far have been (1) proximity of raw materials, (2) favourable climatic conditions, (3) availability and relative cheapness of labour, (4) easy transport, (5) cheap power and (6) a market on the door-step. The same arguments have appealed in turn to the pioneer and every other person who has followed in his foot-steps. In addition to the above with the advent of the state as an active participant in industrial development, other considerations have received attention. For instance, by way of solving the problem of providing work in chronically backward areas or by way of famine relief or for strategic reasons Governments now encourage certain industries. Again as a measure of precaution the state has voted for the dispersal of key industries. The earlier considerations have begun to lose force little by little as a result of scientific developments, through concessional transport rates or by reason of the levelling of wages and power tariffs. Recent experience has shown it is unadvisable to allow a very large number of units to spring up in the same place, bringing in their wake the problems peculiar to labour, of unrest, slums and such like ills.

242. As has been observed earlier the cotton used in any unit is rarely limited to what is grown within easy reach of the mill,

A variety of cottons drawn from different places to some extent would have neutralized any advantage accruing from locating the units in a cotton area, say, like Salem. And when we come to consider the spinning of fine yarns from imported cottons the advantages would seem to have vanished altogether. Therefore, the logical development would appear to be for fine yarn mills to be located as near a port as is possible thereby facilitating easy movement of the raw material as well as of the finished article, especially where an export business is practicable. It is assumed here that other factors are equal for the setting up of the industry in that particular location. The rapid growth of Bombay may be traced to this advantage. It is desirable, however, to profit by Bombay's experience and avoid the overcrowding, the insanitation (and consequent absenteeism through ill-health) and unrest now witnessed in that centre.

243. *Powerlooms as against handlooms.*—The problem of adjusting these two economies has received considerable attention from time to time and more especially when the handloom industry was passing through one of its periodic doldrums. Under normal conditions, the first sign of unemployment appears among the handloom weavers and is generally an indication of a trade recession. Therefore, the Provincial Governments have with the assistance of the centre made some attempts to cope with the spells of unemployment, but the steps taken so far have been unable to solve effectively the problem. This may be due to the fact that expediency has dictated the various measures rather than a long term policy. It must be conceded at the outset that for standardized bulk productions the mills offer better value for the money paid than do the handlooms. On the other hand, where craftsmanship or a specialized production is required the handloom weaver can have no real competitor. It is also true that the handloom can cater better for the requirements of a village economy. But any effort made to treat the two industries as being competitive in all respects is to proceed on wrong lines. At no time can the handloom goods compete with mill productions in simple greys like plain shirtings, mulls, longcloth, etc. Equally in the field of dhoties with special borders or in saries or in other styles which call for several changes in the warp or the weft, the mills stand at a disadvantage.

244. The relatively high price charged for the handloom goods arise from (1) the higher price paid by the weaver for his yarn, (2) the wasteful methods employed, (3) the shorter hours he is compelled to work as he is his own buyer, technician and salesman, (4) non-standardization and (5) improper marketing.

245. In regard to (1) so long as the handloom weaver buys his yarn in the shape of reeled and bundled yarn, the price he is asked to pay is bound to be more than what it would cost a composite mill, or a powerloom, which takes its requirements as cones or beams. The handloom weaver has also to pay the costs

of distribution of the yarn, he buys. The weaver is an individualist and he is also improvident. These two characteristics of his stand in the way of any concerted long-term effort. In the matter of the second of the causes, the experience has been that the weavers prefer their old methods even though they are given from time to time opportunities to adopt more economical ways of working. For instance, nothing came of the peripatetic parties which were working in the province several years ago. The attempts made at getting yarn warps sized at standard lengths and ends came to nothing. (3) The weaver prefers to work ordinarily when he is in a mood to work and will not conform to any regular hours. In addition to the self-imposed handicaps the independent weaver spends considerable time going to the market for his yarn and putting through the delicate negotiation which results in his obtaining yarn on credit. Except in centres where a large number of looms are working and where it is, consequently, possible to set one buyer against another, the weaver has had little chance of driving a fair bargain. (4) Standardization to some extent would have helped, but variations have been so many even locally that no great headway has been made in the past or in the present. It is only in the case of a few efficiently run co-operative societies that we have to-day some semblance of uniformity in quality, avoidance of the grosser faults and an attempt at regulated prices. (5) These several uncertainties stand in the way of proper marketing of the hand-loom goods and everyone of these has had its adverse effect on the price realized. Any marketing society which takes up the job must start with grading, with guarantee of texture, quality, fastness of colour and correctness of dimensions of the cloth it offers for sale.

246. In conclusion it may be said there is scope for the mills and the handloom industry to work side by side but within their own limits.

247. *Ancillary industries to textiles.*—In view of the gradual growth of the textile industry in the south, an endeavour should now be made to start those small industries which would help to establish the main industry on a firm basis. The immediate need would appear to be for foundries and workshops for the manufacture of spares and accessories the demand for which is growing apace. The question of manufacturing full textile machinery also may be taken in hand, not exclusively as a provincial venture with provincial scope, but as part of the general pattern for post-war planning. The necessary material is no more difficult to obtain in South India as in the rest of the country and as for mechanical skill the south can any day hold its own against the north.

248. Other developments should be in the direction of building of bleaching, dyeing and finishing works for the handloom cloth which to-day suffers on account of its poor appearance to some extent. Processing plants which are willing to take up job

works also should be encouraged. In northern India a substantial business is being done by job dyers and printers and there is no reason why the indigenous craftsmen of the south should not benefit by this development. Block-making, roller engraving and stencil-making will naturally follow from the printing trade. The manufacture of printing inks and paste which is an offshoot of large scale printing may be encouraged as also minor chemical industries.

249. It is necessary that these several industries do set themselves the highest standards in their manufacturing programme as any laxity in the beginning will impose a needless handicap not only on these subsidiaries but on the main industry as well. The experience of the war years when the scarcity in most commodities was heartlessly exploited should not be lost on us and every new product in future must be made to pass the strictest of tests before it is permitted to be sold. If any industry goes before the Tariff Board for protection it must be made to disclose its costing methods of manufacture and the objectives aimed at before any assistance is given to it. To spoon-feed the inefficient or the undeserving at the country's expense will be under the new dispensation nothing short of a crime.

250. *Costings.*—In the past every Tariff enquiry had made some attempt at arriving at the costings both of indigenous as well as of competitive imported qualities and on every such occasion the Board had to admit ultimately that they had extreme difficulty in reconciling the data given by the several parties appearing before them. The introduction of the Textile Control necessitated the fixing of ex-mill prices and to that extent we may assume some progress has been made in determining what a reasonable price should be for each production. But even here sectional costings do not appear to have been done, the Control Board being content merely in fixing a fair margin on the over-all working. As one of the primary considerations with the Board was to assure the country of the maximum production possible by the industry they allowed themselves to fix prices which would keep even the less efficient units working. Consequently, it cannot be maintained that the prices fixed by the Board represented in any correct measure a fair price as would be accepted under normal competitive conditions. The recent wage awards and the fixation of basic wages have brought the question of costings once again to the fore-front, as without determining in advance the number of operatives for each section no correct estimate can be made for the over-all wage bill, neither can a fair price be fixed for the manufactured article. The tendency to overlook the consumer's point of view in the face of urgent demands by labour on the one hand and by the industrialists on the other is bound to lead to serious repercussions when supply has caught up with demand and when it comes to a question of exports, India which is happily placed to-day not because of any

inherent stability in its own industry but because other countries are passing through greater tribulations may later find herself in a different position. Therefore it becomes imperative that proper costings should be undertaken and sectional accounts maintained as otherwise with the greater association of labour in the working of the industry friction between the employers and the employed is bound to result.

B. Consumption of Indian cotton by mills in south zone during season 1946–47.

Trade descriptions.	Consumption in bales.	Bales.
Bengal Deshi	191	
		191
Oomras short staple	5,661	
Oomras long staple	31,003	
Buri (American seed)	1,193	
		37,857
Punjab/American medium staple ..	43,552	
Punjab/American long staple	31,419	
Sind/American medium staple ..	7,652	
Sind American Long staple	53,124	
		135,747
Westerns/Northerns—		
(*a*) Ordinary	33,813	
(*b*) Farm	31,343	
Cocanada/Warangal	5,279	
Cambodia/Tinnevellies/Salem	275,748	
		346,183
Comptahs, upland	26,691	
		26,691
Surti	2,151	
Broach—		
(*a*) Fair staple	1,904	
(*b*) Farm	7,186	
Dhollerahs	2,218	
		13,459
Other Indians	3,078	
		3,078
Total ..		563,206

[*A dissentient note by Sri R. Suryanarayana Rao, M.L.C., and Janab M. Mohamed Ismail Sahib is printed at the end of this Report.*]

Extract of the Recommendations of the Panel on Rayon and Artificial Silk.

"We consider that Mettur Dam or thereabouts or Nellore district in the Madras Province is a suitable site for the establishment of a Rayon factory."

CHAPTER XXIV.

Rubber and Rubber Goods.

251. Rubber is an important raw material in industrial production. The total area under cultivation in India is 136,000 acres (1940–41) of which more than 95 per cent, that is, 129,000 acres, are situated in the Madras Province and the neighbouring States, particularly Travancore. The total production of rubber in India is about 17,000 tons. India was importing about 1½ crores worth of manufactured rubber goods and about 3,300 tons of raw rubber valued at 32 lakhs (1940–41). We were exporting during the same period about 40 lakhs worth of manufactured rubber and 91 lakhs worth of raw rubber. In 1943, the number of factories in India utilizing rubber in the manufacture of some product or other was estimated to be 114, Bengal, Bombay and Punjab having the largest number and Madras being without a single factory. The main use to which rubber is put is in the manufacture of pneumatic tyres for motor cars and cycles. The other industries in which rubber finds use are those engaged in the manufacture of textiles, adhesives, electrical products, abrasives, bag manufacture, boot and shoe manufacture, upholstery, plastics, carts, motor, linoleum, erasers, ebonite, etc. There are to-day several factories in Bengal manufacturing motor tyres. The raw materials for the factories in Bengal have to be obtained from distant places but in spite of this disadvantage, the industry has been successfully established.

252. Our Province has the advantage of having rubber produced locally; but in spite of this advantage has made no progress in establishing the industry. Considering the large requirements of pneumatic tyres for cars and cycles, we would recommend the establishment of this industry in South India. The Travancore State contemplated the establishment of such an industry but we learn that no progress has been made for some reason or other. We would suggest the establishment of such an industry at some suitable location in the southern end of the peninsula. It will be better if such an industry could be established in co-operation with the Government of Travancore.

253. A number of smaller industries for the manufacture of other rubber products can also be started in suitable places in this Province; particularly for the manufacture of rubber sheeting as well as ice and hot water bags, gloves and ebonite and other equipment required for hospitals and the electrical trade.

CHAPTER XXV.

Paper.

254. Another industry which is being neglected in our Province is the paper industry. There is only one paper mill at Rajahmundry, and it has had a very chequered career. The major raw materials required for the paper industry are materials with a high cellulose

content, caustic soda, limestone, china clay, soda ash, lime, bleaching powder and rosin. India was consuming in 1937–38 about 210,000 tons of paper, of which 45,000 tons represented newsprint. The production of paper in India was about 50,000 tons. During the war years the production of paper has doubled itself. But this has not reduced our dependence on imports as our present consumption if fully met would be twice as much as in the years 1937–38. Another point which should be borne in mind is that with the increase of literacy the consumption of paper including newsprint is likely to be very much on the increase in the coming years.

255. The cellulose raw materials which are available in our Province are bamboo, eta reed, botha grass, cotton linters and ground wood pulp. There is one difference in the raw materials consumed by the Indian mills and by the American and European mills. Excluding the Himalayan region, India is deficient in soft wood which is the product mainly used by the American and European mills. In place of soft wood we have so far succeeded in utilizing bamboo and botha grass. Two private industrialists, one in Bihar and another in Madras, have investigated with the assistance of foreign experts the use of hard wood pulp as raw material. The reports, we understand, show that they could be used successfully for the manufacture of newsprint and other varieties of lower grade paper. Eta reed is found in the Papanasam area of the Tinnevelly district. Bamboo is found practically everywhere, but the largest quantities would appear to be in the Waynaad, the Godavari and Vizagapatam forests. Botha grass is understood to be available in large quantities in the Ceded Districts. The other raw materials required for the paper industry are already available in our Province or will soon be produced in our province if the plans for the starting of new industries are implemented. The panel on paper has opined that a 8,000 ton capacity plant will be an economical unit and subject to further investigation we are of the opinion that three or four such factories should be set up in our province. We would suggest that they should be located, one in Tinnevelly district utilizing the eta reed, another in the Ceded Districts utilising the botha grass, the third in Mettur or Wynaad utilising the bamboo, the fourth at the existing factory at Rajahmundry and the fifth in Vizagapatam district. In addition to these we would suggest that investigation should be undertaken for the establishment of a newsprint industry in the Wynaad. Side by side with the starting of some of these mills we would recommend that the Government should undertake investigations in the use of cotton linters, hardwood pulp, etc., in the paper industry. This would require the establishment of a research institution with a pilot plant in our province, and this in our opinion is an essential preliminary to the development of the paper industry. In locating the industries the factors which should be taken into consideration are proximity to areas where limestone and power are available. It

has been estimated that three tons of coal would be required to produce one ton of paper. But in the event of our using hydro-electric energy our dependence on coal could be reduced to reasonable limits.

256. *The Rajahmundry Paper Mills.*—From every point of view, the present location of the paper mills at Rajahmundry is ideal. Its chequered history has not been the result of any technical difficulties. We are therefore surprised that the industry should not have become during the course of the quarter century since it was started one of the foremost paper mills of India. Its failure is a great slur on our industrial efficiency. We would therefore recommend that a conference of some of our leading industrialists interested in the paper industry should be convened with a view to rehabilitating the mill at Rajahmundry. The manufacture of card board is an industry which could be taken on a smaller scale. Here again where many have promoted companies for the manufacture of these products, but few have succeeded in establishing them on sound lines. It may be necessary to institute an enquiry into the causes of their slow development.

257. We have suggested in the chapter on forests, the manufacture of wood-pulp by the Government for sale to the paper industry in order not merely to conserve our forests but also to reduce the capital expenditure by private industries. We would recommend that the Government should take up the investigation of this proposition immediately.

Extract of the Recommendations of the Panel on Paper, Pulp, Board and Chemical cotton industries.

As regards new mills, we recommend the following areas should be recognised as suitable for establishment:—

(*a*) Paper—Madras, Bombay, etc.
(*b*) Newsprint—Kashmir, Tehri, Garhwal and Punjab.
(*c*) Boards—Bombay, Bengal, Madras, Central Provinces and Berar, etc.

CHAPTER XXVI.

Food and Food Products.

258. It is a pity that in a province which is predominantly agricultural, little attention has been bestowed on food industries. First and foremost in the food industries, we would place milk and milk products. Nothing is more tragic than that our children should be fed on imported milk products when we have the largest number of cattle as compared to other countries in the world. The manufacture of milk products is not purely an industrial problem, but a mixed one of agriculture, cottage industry and factory production. As an article of food, there is nothing superior to milk which supplies those minerals and constituents which are poor or lacking in our normal diet. It is unnecessary for us to dilate on the need for increasing the milk production as the subject has not

suffered for want of either propaganda or literature. The time has come when we can no longer afford to neglect the initiation of a large scale plan for increasing milk production in our Province. As we have said in another chapter, large areas of land must be reserved for cattle grazing where fodder could be cultivated. Again, investigations must be undertaken to determine the composition of the ideal fodder for milch cows and co-operative societies should be started to make supplies of them available to the dairy farms. The breed of milch cows should be improved with a view to secure a higher yield per capita. It is only after these things have reached a successful stage that it would be possible to think of producing children's food and other products of milk, such as butter, ghee, cheese, casein, etc. We would recommend, as a matter of immediate urgency, the constitution of a committee by the Government entrusted with the task of preparing a blue-print for the entire province for establishing centres of milk production.

259. Fishing is only second in importance to milk. At present fishing is confined to inland waters and to the coastal strip. Deep sea-fishing has not been undertaken in our province. Recently an industry has been started on the west Coast to engage in deep sea-fishing, and we understand they have made some progress in the purchase of trawlers, etc. We are to-day spending large sums of money on the Fisheries department without any augmentation of the supplies of fish as a return on the expenditure. Our fishermen, if properly trained, could undertake deep sea-fishing. To develop deep sea-fishing, it may be necessary to secure the services of a few Japanese experts to train our fishermen for this purpose. Once we have our local men trained in deep sea-fishing, all that would be necessary to develop that industry would be for the Government to secure some fishing trawlers and hire them out to societies of fishermen engaged in the trade. In course of time, these fishermen themselves should have accumulated sufficient funds to become owners of fishing trawlers. Storage facilities and refrigeration warehouses would be necessary to preserve the fish and these should be located at many centres along the coastline where fishing is concentrated. A subsidiary industry would be the manufacture of fish manure and fish glues. Here again, our recommendations are that the Government should ask the Fisheries department to prepare a blue print for the development of the fishing industry.

260. *Biscuits.*---Biscuits are being manufactured in our province. The industry is however on a cottage industry basis. The cottage industries are concentrated in Usilampatti in the Madura district. The quality of the biscuits is below the standard of imported biscuits, and we are not sure that either in the composition of the biscuit or in the manufacturing process scrupulous attention is being paid to purity and cleanliness. While we do not condemn the manufacture of biscuits on a cottage industry basis

it is also desirable to promote the manufacture of biscuits on the latest factory methods. The raw materials for the manufacture of biscuits, namely, wheat or corn flour, would have to be imported but this we do not consider a great disadvantage to the industry. We would recommend the constitution of a committee to inspect the existing biscuit factories in the province with a view to frame regulations for the imposition of standards of purity and cleanliness in the manufacture of biscuits. The utilization of groundnut and groundnut cake in the manufacture of a food product like biscuit is of paramount importance. Groundnut cake is the richest protein compared to any other matter of vegetable origin. The Indian diet being very deficient in proteins, it is essential if we are to improve the average diet of the South Indian to encourage a large intake of proteins. We believe that during the war, some researches have been done in the utilization of groundnut and the groundnut cake in the manufacture of biscuits. We do not know why an industry has not been started for their manufacture. We strongly recommend that Government should take up immediately the investigation of the possibilities of manufacturing biscuits or some alternative food product utilizing the available proteins and mineral constituents of groundnut.

261. *Confectionery.*—There are several factories producing confectionery, a few on a large scale and the rest on a small scale. The industry under the management of Parrys have been producing confectionery equal, if not better, in quality to the imported products. We do not think there is any need for us to make specific recommendations in respect of this industry as it may be considered to have established itself successfully in this Province.

262. *Flour mills.*—There is not a single flour mill in our Province grinding wheat or corn. That we depend on imported wheat is no reason why we should not have at least one or two units making flour. Flour is being consumed in the Province as well as semolina and one or two flour mills if established could undertake their production. In any event it is desirable that we import whole grains instead of ready-made flour either from other Provinces or from foreign countries.

263. *Coffee.*—The preparation of coffee powder for consumption in our homes is now being undertaken both as a factory as well as a cottage industry. We do not wish to say more here than that it is essential that the process of manufacture and the purity of the product should be controlled by the Government.

264. *Hydrogenation of fats.*—Edible oils have been extracted and consumed in the natural state by our people until recently, excepting ghee in the preparation of which we have been following traditional practice. Either on account of increased intake by our people of vegetable fats or on account of falling supplies of ghee it has been found necessary for us to supplement our supply of edible oils by consumption of vegetable ghee. A number of

factories for the manufacture of Vanaspathi (Vegetable ghee) have been sanctioned in our Province and a few of them are already in production. The value of Vanaspathi as an article of food is now a subject of controversy and scientists are engaged in resolving the controversy. Until the results are known, it will not be desirable to increase the production of Vanaspathi.

265. During the war period, some attempts were made to utilize vegetable oil as fuel. We cannot condemn this move too strongly. In our opinion, considering the deficiencies of this Province in the matter of food, any use of edible oils or of any other article of food for industrial purposes should be prohibited.

CHAPTER XXVII.

SUGAR.

266. The sugar industry claims to be the second largest national industry representing an investment of capital to the extent of 33 crores. The area under cane cultivation in India including Pakistan is about 4 million acres, which is approximately 35 per cent of the world's sugarcane area. The production of sugar including gur in India approximates to 26 per cent of the total cane sugar production of the world. Until 1930–31, India was importing annually large quantities of sugar valued at about Rs. 15 crores. To-day, India exports a small quantity of about 18,000 tons of sugar every year. The area under sugarcane is about 2 per cent of the total area under cultivation. The average cane production per acre is about 15 tons. The total production of cane sugar in tons from factories is roughly 1 million tons, sugar refined from gur and khand-sari is about 66,000 tons, making a total sugar production of 1,066,000 tons. The estimated net production of gur amounts to 4 million tons. The consumption of sugar is 963,300 tons and the consumption of gur is estimated at 4,250,000 tons giving a per capita consumption for India of 30 pounds of sugar and gur annually. The annual per capita consumption of sugar in a few other countries is given below :—

	LB.		LB.
United Kingdom ..	106	Japan	33
United States of America.	97	Brazil	34
France and Germany..	52	Java	11

Coming to the Madras Province, the area under cultivation of sugarcane in the year 1945–46 is 160,700 acres; the yield of cane per acre is 24 tons; the total yield for the Madras Province being 3,856,800 tons. Out of this, about 10 per cent, i.e., 420,400 tons are crushed by the various factories in the Madras Province. The sugar produced at the factories in the Madras Province is about 40,000 tons. The per capita consumption of sugar in the Madras

Province is 3·4 pounds calculated on a population basis of 48 millions, as against 5·8 pounds in Bengal, 17 in Bombay, 7·1 pounds in the United Provinces and 11·8 in the Punjab. But this does not take into account the consumption of gur by the people. The consumption of gur in the pre-war period (1937–38) has been calculated at 12·1 pounds for Madras, 22·8 for Bengal, 53·9 for the United Provinces, 14·4 for Bombay and 23·3 for the Punjab. In regard to the consumption of sugar, distinction has to be made between urban and rural populations. The pre-war consumption of sugar in the urban areas in the Madras Province is 51·2 pounds and of gur 8·9 pounds making a total of nearly 60 pounds per capita consumption. The per capita consumption in urban areas is therefore roughly four times the per capita consumption in rural areas. The total consumption of sugar in the Madras Province is 90,000 tons as against a total production of 47,445 tons thereby showing a deficit of 43,000 tons. Taking the total acreage under cultivation in the Madras Province, we can estimate the total production of gur at 300,000 tons. The total consumption of gur in the Madras Province would amount roughly to 250,000 tons, leaving a surplus of gur of 50,000 tons which is probably being exported outside the Province. These figures lead us to infer that unless the per capita consumption of sugar and gur increases, the production taken together is sufficient to meet the demand. The Government of India have permitted the location of six new factories in Madras, each with an annual capacity of about 10,000 to 12,000 tons. The Government of Madras have, however, sanctioned the establishment of nine new factories in the Madras Province after the date of the panel report, with an aggregate daily crushing capacity of 4,700 tons. After they come into operation, they will be able to make good the deficit of about 43,000 tons of sugar.

267. In connexion with the sugar industry, Mr. T. G. Armstrong of Messrs. Parry & Co. was examined by the Committee. His evidence is printed as Appendix. He expressed the view that existing factories should be allowed to expand up to 800 tons crushing capacity per day in order to make them economic units and that only thereafter should new factories be considered. He stated that about 5,000 acres of sugarcane area will be required to feed a factory of that size. The Committee examined this aspect of the question also and they find that the conditions of sugarcane production in Madras are not the same as those in North India. Sugarcane is an irrigated crop in this Province and it requires water practically throughout the year. There are not many places in our Province where compact and extensive areas suitable for sugarcane cultivation with a perennial source of water are available. At present cane is grown in smaller areas but dispersed. This dispersal of sugarcane areas imposes a limitation on the size of the factory. It may not be possible therefore to have bigger plants in all places as recommended by Mr. Armstrong.

268. The questions which arise for consideration in connexion with the sugar industry may be stated as follows :—

(1) Whether the area of cultivation under sugarcane should be increased in the Madras Province?

(2) Whether it is desirable to increase the production of sugar at the expense of gur?

(3) Whether it is desirable to encourage a larger intake of sugar by the people?

Sugarcane, while it may be classified as a food crop, is grown on land which is equally suited for cultivation of rice. To that extent, it is a competitor to rice crop. As production of rice is of primary importance, we are of the opinion that extension of the area under sugarcane cultivation is not desirable.

269. Sugar is processed gur and the growing preference shown for sugar is largely a matter of fashion. While in the case of production of gur, the profits go to the agriculturist, in the case of production of sugar, the profits are shared by the industrialists and investors. Moreover, the sugar industry calls for a large investment on imported foreign machinery. It also requires quantities of imported sulphur for refining. Except for the fact, as we have said, that with the increasing standard of life there is a fashion to prefer sugar, in the interests of national economy, it is not desirable to increase the production of sugar at the expense of gur.

270. No useful purpose is served by comparing the per capita consumption in India and the per capita consumption in the European and American countries. The average diet of the Indian consists of rice or wheat which contains 70 per cent of carbohydrates, while on the other hand the diet of the average European is rich in proteins. Sugar is 100 per cent carbohydrate, and it is not therefore going to add additional value to the Indian diet. Moreover, it is better to increase the energy value of food by the addition of more fat than by sugar. The South Indian diet is mainly deficient in proteins and protective foods and it will not be substantially bettered in nutrition by the increase in sugar consumption. In this connexion, we may point out that the per capita sugar consumption in Japan and Brazil are almost on a par with the per capita consumption in our country. Moreover, with the total prohibition programme of our Government, we may expect that jaggery extracted from the palm trees would mean a substantial addition to our sugar and gur production.

271. We are therefore of the opinion that with the proposed new factories sanctioned by the Government, we should be able to make up the deficiency of 43,000 tons of sugar; and that the Government should not permit any further expansion of the industry. We also feel that it is not necessary to encourage greater

consumption of sugar and if our Government should take steps to place an embargo on imports of sugar into the Province, it will not be impairing either the health or the vitality of the people.

[*A dissentient note by Sri R. Suryanarayana Rao*, M.L.C., *and Janab M. Mohamed Ismail*, M.L.A., *is printed at the end of this Report.*]

Extract of the Recommendations of the Panel on Sugar, Alcohol and Food Yeast Industries.

"We recommend that three units of 10,000 to 12,000 tons of annual sugar production capacity should be installed as early as possible."

We consider, that the standard size of distilleries should be one million gallons capacity and that the standard distilleries should be situated mostly in the United Provinces and Bihar which are the main sugar producing areas. We suggest that the two units be located in Madras and Orissa each with a capacity of 4 lakhs gallons.

CHAPTER XXVIII.

BY-PRODUCTS OF SUGAR INDUSTRY.

272. In the Chapter on sugar industry, we have suggested the development of the sugar industry up to the present level of consumption in our Province, namely 90,000 tons per annum. With the maximized production in the existing and projected factories the peak may be taken as one lakh tons.

273. The problem in sugar factories is to find profitable use for the by-products of the industry, namely, molasses, press-mud and bagasse. Of these, press-mud is not of much value and can be used for manure as at present. Bagasse can be utilized for manufacturing articles like pressed insulation boards, cardboards, etc., easily and for rayon or plastics if costly capital investment is possible and highly technical management is found. Bagasse is also a by-product in our industry which consumes over two-thirds of the cane grown in our Province. We do not consider it worthwhile to attempt the production of plastics or rayon as a short-term programme. The demand for pressed board and similar products is somewhat limited, but its larger use in building industry can be popularized. Nevertheless we consider it would be advisable to instal and work a factory in one centre where the largest quantity of bagasse is available, namely, at Nellikuppam.

274. Molasses therefore form the most important by-product of the sugar industry requiring proper utilization. According to Dr. Dhar, molasses contain 60 per cent carbohydrates, 2 per cent calcium, salts, potash, phosphates and some free acids. For a peak production of 100,000 tons of sugar there will be about 40,000 tons of molasses available. The Panel of the Government of India concentrated their attention on utilizing the bulk of molasses for production of power alcohol. They also examined the possibility of production of food yeast but recommended only small trial plants

for the purpose. Dr. Dhar has suggested the use of molasses mixed with press-mud for reclamation of alkaline land. A fourth use, which is partly adopted now, is the production of rectified and denatured spirit for pharmaceutical and industrial purposes.

275. One ton of molasses will yield about 56 gallons of power alcohol. The Panel has suggested the establishment of power alcohol distilleries, one in the Circars and one in the South Arcot district, each capable of producing 400,000 gallons yearly. The location of the industry must be within the easy reach of the sugar factories with good transport facilities. Since Government have decided to nationalise transport, they will be consuming large quantities of petrol. Power alcohol has a strategic value. Its production should therefore suggest the installation by the Government of two distilleries with a production capacity of 750,000 gallons each. This would consume about two-thirds the quantity of molasses produced in the Province, which is probably the quantity which can economically reach the distilleries. The Panel Committee has recommended a mixture of 20 per cent of power alcohol with petrol, as is being done in Mysore and United Provinces. They have suggested the use of the mixed petrol in areas adjacent to centres of production to minimise the cost of transport. We are in general agreement with the recommendations of the Committee in these particulars.

276. The balance of molasses which will be about 13,000 tons should be utilised in the following manner. First preference should be given to the production of industrial alcohol the demand for which is likely to increase with the expansion of the chemical and munitions industries. We have no data as to the present consumption of industrial alcohol in our Province. We would only say that we should aim at self-sufficiency. This can be combined with power alcohol production in the two places proposed above; or the existing distilleries may be set apart for the purpose. The latter seems to be more feasible. It would be better if this also is nationalized like the power alcohol industry for convenience of control, especially the present policy of prohibition.

277. Practically, the whole balance of molasses left after the production of power and industrial alcohol must be utilised for reclamation of alkaline land. There are extensive tracts of such land in our Province, some of them located not far from sugar factories, which after reclamation can be brought under cultivation of good crops. This will not need any plant or manufacturing processes and will only involve transport and distribution to the required areas. Our food policy demands that reclamation of alkaline lands in this way should be undertaken by Government as the landowners may not easily come forward to do it. Part of the cost which is not likely to be high, may be recovered directly from the landowners and part indirectly in the shape of land revenue. At the Vuyyur Sugar factory visited by the Committee, considerable

investigations are being undertaken to use the bagasse for various purposes and also the effluents. The Committee has seen a recent article on the possibility of using powdered bagasse and molasses as cattle feed.

278. Lastly, we agree with the recommendation of the Panel that utilization of molasses for food yeast should not be undertaken on a large scale until the possibility of its utilisation in nutrition is practically tested in the field. As recommended by the Panel, we suggest that three plants be installed at three selected centres to serve the whole Province, each capable of producing only 1 ton of food yeast. Since it requires only 3 tons of molasses to produce one ton of food yeast, this will not hinder substantially the utilization of molasses for the other three purposes mentioned above. The Government must guarantee the purchase of the entire production for 5 years at a suitable price. If its use becomes popular, expansion may then be considered and effected.

CHAPTER XXIX.

SMALL SCALE INDUSTRIES.

279. We give below some suggestions for the starting of small scale industries in our Province.

280. *Pencils.*—The manufacture of pencils was started in Madras several years ago and the Madras Pencil Factory is still producing pencils. But unfortunately no attempt has been made to modernise the equipment and the quality of the pencil does not compare favourably with imported qualities. The pencil industry can also be done on a cottage industry basis; a central factory making only the leads, distributes billets of wood to people who turn it into shape by hand lathes and fit in the leads. They are then collected, varnished or painted, maker's name, etc., stamped at the central factory before put on the market.

281. *Pen-holders and nibs.*—Small quantities made in Bengal used to be formerly available. This is an industry which requires very little equipment and can be started with small capital.

282. *Pins and fasteners.*—Various types of these can be made with small presses and dyes.

283. Instrument boxes, scales, erasers, ink bottles, fountain pens, pens and writing ink are samples of some of the small scale industries which can come into existence in the Madras Province.

284. *Carbon paper and ribbon.*—The industry has been projected on modern lines in our Province.

285. Office equipment is another class of industry which takes up the manufacture of typewriters, duplicators, intercommunication appliances, etc. (A typewriter industry is projected in Madras.)

Limited quantities of stationery, filing and index cabinets are made in the Ajax Factory.

286. Considering the number of printing establishments in Madras, an industry for the manufacture of printing machines including cutters, stitching and ruling machines, etc., could command a good market as also the manufacture of printing ink and type metal.

287. Another group of small industries are, sewing machine manufacture and parts, gramophones, razors and razor blades, penknives, scissors, mechanical toys, spectacle frames and glass thermos-flasks, timepieces, torches, etc., and containers for various purposes such as packing foodstuffs, etc. A good toilet industry manufacturing tooth brush and paste and other articles of toilet are worth investigation.

288. The chief drawback in the past with those small industries has been their failure to maintain a standard comparable to that of foreign products. What we observed in the case of pencils applies with equal force to the attempts to other products of local manufacture. The products of these small industries have failed to attract the buyer except during times when similar foreign goods were in short supply. Poor quality, lack of distribution policy and want of publicity have been the defects for the decline of these industries. These small industries cater to the needs of middle class and can be expected to enjoy a constant demand. If attempts are made to start the manufacture of these by modern methods and with a determination to maintain a uniform standard of high quality we do not see any reason why they should not be successful. The industrial future of our Province cannot be safely built up on a few big industries alone. A large number of small industries will provide the groundwork for a broad based development of industries.

CHAPTER XXX.

CONCLUSION.

289. We have in the foregoing chapters of this report recommended the establishment of various industries as short-term propositions, that is, industries which should be started during the next five years. If even a majority of them were to be established in the Madras Province, Madras would become one of the foremost industrial provinces of India. The Government of Madras and enlightened public opinion are both anxious that our Province should become rapidly industrialized. An enumeration of industries which could be established is not enough. A great deal more has to be done if they are to be established as we have said in the next five years. In our preliminary report, we have made several recommendations with this object in view, the most important of them being the establishment of the industrial finance corporation immediately. It is not necessary

here to repeat the list of difficulties in the way of the rapid industrialization of the Province, which we have dealt with in the preliminary report. The problem of rapid industrialization has to be viewed from two angles : one being to determine the assistance that the Government should render to private industrialists who come forward to establish industries; the other being to consider the steps that should be taken by the Government in the event of private initiative to start industries being lacking. In our opinion, the latter problem is likely to become more prominent in view of the increasing lack of confidence on the part of private industrialists and investors in new industries caused by labour unrest and financial stringencies. If this problem were at all to be tackled seriously, it would require a new orientation to the policy of our Government in the matter of industrial development, and as flowing from it the reorganization of the Department of Industries and Commerce.

290. We will now examine the present organization of the Industries Department with a view to see how far it is capable of handling the additional responsibilities. The Industries Department is, roughly, discharging four kinds of responsibilities. Firstly, it exercises ultimate management of a few Government-owned factories like the Kerala Soap Institute, the Government Oil Factory and the Silk Filatures at Kollegal. Secondly, it is undertaking the task of imparting technical education to the people of the Province through the various industrial schools at Madras, Madura, Bellary, Coimbatore, Calicut, Mangalore, Beypore, etc. Thirdly, it is engaged in the investigation of cottage industries, in research, in statistics, pumps and boring, handcraft, minor engineering and in handling the various routine and administrative matters connected with industries. Lastly, it has a large personnel engaged in the development and research of pisciculture.

291. We will first deal with the management of industries by the Government. The Kerala Soap Institute is perhaps the earliest soap industry started on a factory scale in India, on the initiative of Sir Frederick Nicholson. The factory has manufactured in the year 1944-45 seven hundred tons of toilet and washing soaps. The sales effected amount to about 11 lakhs of rupees. After charging interest on capital, the institute has given a net yield on the capital of 38·4 per cent. Long after the Kerala Soap Institute was started, the Tatas started a soap factory at Cochin whose present annual production is about 12,000 tons. Considering the profits made by the Government Institute at Calicut, we fail to see why the factory has not been developed at all since it was started. The production of about 700 tons is the output of a midget industry or a cottage industry. We are importing somewhere about a thousand tons of soap from other provinces excluding Cochin. Not only has this factory

not enlarged its productive capacity, but its products are neither advertised nor are they retailed in attractive cartons. The factory can lay no claim to educative value as it is a small obsolete unit. The Government Oil Factory at Calicut produces about 26,000 gallons of shark liver oil, the sales being roughly of the value of Rs. 4 lakhs. In the Administration Report, it is frankly admitted that it was not possible to introduce the commercial system in the factory though the Government ordered that it should be introduced with effect from 1st April 1943. The Silk Filatures at Kollegal is an acquisition by the Government during the War period on account of the importance attaching to the manufacturing of parachute silk. Considering the outputs of the Government-owned factories and the progress made by them since their establishment, we cannot help drawing the inference that the Department of Industries and Commerce is not organized to run these concerns on progressive lines.

292. We have said in our Preliminary Report that technical education should be imparted side by side with factory training. The various industrial schools where technical education is being imparted are not engaged in the manufacture of any article, but occasionally engaged themselves in doing minor repairs. The workshops attached to these trade schools are intended solely for purposes of demonstration and not for manufacture of any useful articles. In our opinion, such a kind of technical education has no value in industry. Technical education should be placed under a Director of Technical Education and based on a well-thought-out apprenticeship scheme embracing all essential industries. We have suggested in one of the chapters the need to establish engineering workshops in all the districts of the Province. These, in our opinion, would be the proper places where students or apprentices should receive practical training to be supplemented by vocal education in class rooms.

293. The third branch of the Industries Department is engaged in a variety of activities. We understand that the Government employs technical experts for the following industries :— Ceramics, Glass, Sericulture, Leather, Paper, Textiles, Oil, Tanning. Except the leather and textile experts, who have some teaching work, the others are expected to advise the industries department on their respective subjects wherever technical advice is sought. We are of the opinion that a distinction should be made in the selection of experts between those that are required for cottage industries and those that are required for large scale industries. An expert to be able to advise on major industries should have the qualifications required by international standards. His services should be made available to any private industrialist who is seeking to establish an industry. We would suggest that the experts to be employed by the Government should be classified into those who could be engaged either in demonstrating or

doing propaganda for cottage industries, and those who are capable of offering advice on major industries. It is no credit to the Government nor is it fair to the expert, if he is called upon to undertake responsibilities which he cannot competently discharge.

294. The Government also employ a large number of District Industries Officers whose functions again are not well defined anywhere. Their qualifications in the event of direct recruitment are a degree of a University in one of the following subjects :— Chemical Engineering, Industrial Chemistry, Applied Chemistry or Geology, Electrical, Mechanical or Automobile Engineering, Economics or Science.

295. A candidate appointed to the post by transfer from the Department of Industries and Commerce need not possess even this qualification. As we have said, we have not been acquainted with the original reasons for the appointment of these District Industries Officers. If they are at all considered necessary, they should have undergone some industrial training and should be in a position to offer technical advice to industrialists in the mufassal intending to start industries. They should also act as liaison officers between the Department of Industries and the local industrialists. The information that we have gathered about the work done by these officers has given us the impression that whatever other work they are doing they are not really rendering any useful service in the matter of developing industries in the districts allotted to them.

296. Another department with a very large personnel is the fisheries department on which a sum of Rs. 20,67,600 has been spent during 1946–47. As far as we are aware, this branch has been mainly concerned with introducing new varieties of fish in some of the inland waters. They have not taken up the question of either deep-sea fishing or the manufacture of the various fish products. The work of the department must be reviewed on the basis whether as a result of their efforts production of fish in the Province has been increased.

297. There is no separate statistical section attached to the Department of Industries, nor is the department concerned with minerals, forest produce, etc., which form the raw materials for any industry.

298. If the Industries department is to play an useful part in the development of industries, it should in our opinion undergo a complete reorganization. Its main function should be to undertake a survey of the industrial possibilities of the Province. For this purpose, it should be assisted by first rate technicians and expert geologists. The department itself should be composed of a number of experts each handling a group of essential industries, like heavy chemicals, machinery and engineering, paper,

pharmaceuticals, etc. To-day, a private industrialist has to get down an expert either from foreign countries or from another Province to undertake the survey and to advise him. The facilities at the disposal of the private industrialist to undertake such a survey are limited compared to what are available to the Government. On the other hand, the Government could undertake the survey and investigation of particular industries and make the information available to the public. For instance, if the paper industry had been surveyed by the Government, we would have information about the quantity of raw material available and their locations, the results of samples submitted for test, blue-prints of the factory, the manufacturers who could undertake to supply and erect the equipment, the cost of production, etc. With these facts available to the Government, they can either invite some private industrialist to come and take up the proposition or if no private industrialist is forthcoming the Government themselves should undertake it, if they consider the industry essential to the Province. In our Province, very few people can afford to incur the cost of the investigation necessary before starting a large-sized industry. That is one of the main reasons why we are backward in the matter of industrial development as compared to other Provinces. The timidity of the industrialist of our Province must be broken by the Government by assuring him that the industry is feasible and could be run profitably. We are afraid that the stage of industrial development which is desirable to reach in this Province will not be reached were the Government merely to content themselves with recommending the establishment of certain industries. It will no longer be a case of selecting the person who should be licensed to start an industry. The Government may have to resort to persuasion and propaganda to find industrialists to undertake them. Investigation expenses and a large share of the financial requirements of the industry may have to be borne by the Government. Assistance in various ways to acquire raw materials, site, power and building materials may have to be afforded. In fact, the Government will have to take an almost paternal interest in the industry and do considerable spoonfeeding in the early stages. The Industries Department should be capable of undertaking this type of responsibility. They should be equipped not only to investigate industries, but to promote and, if necessary, manage them.

299. The Committee had occasion to visit a few industrial establishments in Mettur, Coimbatore, Bezwada, Vuyyur, Masulipatam and Vizagapatam. They also interviewed the managements of these establishments with a view to enquiring into the difficulties, if any, encountered by them in maintaining their production. One universal complaint by the managements is the difficulty of securing adequate supplies of power to run their factories be it

electricity, coal or fuel oil. Some of the factories were suffering from short supply of raw materials and some were experiencing difficulty in procuring supplies of containers. For instance, a factory manufacturing electrical motors for agricultural purposes complained of the difficulty in getting supplies of insignificant quantities of yarn for making D.C.C. wires. A rolling mill was obliged to shut down several times in a year owing to short supply of billets and coal. A factory manufacturing precision instruments was experiencing difficulty in procuring supplies of optical glass from the United States for want of import licence. The pharmaceutical industries complained of difficulty in marketing their products owing to scarcity of bottleware. A paint factory complained of lack of containers. One or two of the factories complained that they were not granted licences to mine though they were equipped to use the minerals for processing. All representations received in writing from these establishments have been forwarded to the Government from time to time in order that they may take such action as they think fit. The Committee is of opinion that little attention is being paid by the Department of Industries to assist the existing industries to overcome their difficulties. The difficulty in procuring import licences for raw materials could have been got over if either the Chambers of Commerce had established a representative at Delhi to assist the various industries or if the Provincial Government had instructed the Director of Industries to recommend to the Government of India deserving cases. In the opinion of the Committee, it is very essential that the existing industries should not be neglected but should receive every encouragement and assistance from the Government. This is another instance where the reorganization of the Industries Department is called for in order that it can maintain a more intimate contact with every industry in the Province.

300. In our preliminary report we recommended that the mining and utilization of all strategic minerals should be wholly left to the control of the centre for development and that their mining and utilization will be a matter for negotiation between the Provinces and States on the one hand and the Central Government on the other. The Government of Madras have written to the Committee their reactions to the recommendations (Refer Appendix XIX). The Committee was of opinion in making this recommendation that the utilization of strategic minerals should be considered not from mere provincial angle but in the interests of India as a whole. But from the communication it appears that the Provincial Government is in favour of a co-ordinated exploitation of strategic minerals with the Central Government. If that be the case, we see no difference between our points of view. We, therefore, modify the recommendation as follows :—

"All strategic minerals, viz., coal, lignite, petroleum, mica, beryl, chromite, illmenite, sillimanite, manganese ore, monasite,

rare earth minerals, all uranium and thorium bearing minerals and piezo quarts may remain under the control of the Provincial Government as at present. But their mining and utilization should be a matter of co-ordinated activity between the Provinces and States on the one side and the Central Government on the other."

301. We take this opportunity to emphasize once again the immediate desirability of employing a team of expert Geologists to undertake a complete mineral survey of the Province.

302. The efforts of the Government of India and of our Province and our own small efforts in the field of industrial planning will bear no fruits if we fail to take a realistic view of the problem of rapid industrialization. Planning reports and speeches can achieve little when private initiative has been killed by threats of changes in the political, social and economical conditions of our country. Governmental initiative must replace private initiative whether we like it or not. We see no other solution to the problem except by Government assuming the role of chief promoter of industries.

C. J. VENKATARAMANA RAO.
Secretary.

S. PARTHASARATHY.
Chairman.

P. S. KUMARASWAMY RAJA. *Member*
R. SURYANARAYANA RAO. ,,
M. PALLAM RAJU. ,,
M. MOHAMED ISMAIL. ,,
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A NOTE ON TECHNICAL EDUCATION.

[By Sri R. Suryanarayana Rao, M.L.C.]

In the concluding chapter of the Report, reference has been made to the need for the reorganization of technical education and the appointment of a Director of Technical Education. The purpose of this note is to elaborate the points further. In view of the importance of the technical personnel needed for the success of any planned development of the province it is necessary to formu late and give effect to a co-ordinated system of technical and technological education training personnel of all grades. The present position is as follows :—

(1) Engineering Colleges are under the Education department. They are all of the University standard.

(2) Polytechnics and industrial schools which prepare for the Diploma standard and the artisan standard are under the Department of Industries. The examinations for the Diploma standard are conducted by the Technological Diploma Examination Board while for the artisan standard by the Inspectors of Industrial Schools who work under the Director of Industries. The Chairman of the Diploma Board is the Joint Director of Industries.

Institutions under (1) are under the control of the Director of Public Instruction who is not conversant with any technological education. Nor has he been provided with technical assistance to exercise effective control and supervision. Institutions coming under (2) are under the control and supervision of the Director of Industries who has under him a number of qualified technologists to assist him.

In the course of this Report we have envisaged the lines of industrial development, both short-term and long-term. It is the Ministry for Industries and Planning which should give effect to the Programme. It will be surprising to know that for some reason the Ministry for Education has undertaken this task and appointed a Standing Advisory Board on Technical Education with the following terms of reference :—

(1) To advise the Government on all matters of technical and technological education of all grades including the University standard, diploma standard and artisan standard on a properly co-ordinated basis to meet the requirements and developments of this Province and India as a whole, and

(2) to examine the technical and technological education of this Province in all its aspects and make recommendations with a view to reorganize it on a basis that will make it more useful, efficient and up to date.

The Board as it is constituted is unwieldy having as many as 26 members with the Hon'ble Minister for Education as the Chairman and the Principal of the Guindy College as the Secretary. One noticeable feature of this Board is the Hon'ble Minister for

Industries and Planning who is in charge of the training of technical personnel is not a member of the Board though he may be required to implement the recommendations of the Board. The Director of Industries or the Joint Director of Industries represents the Industries Department. How can there be co-ordination between different standards of technical education unless the Hon'ble Minister concerned is at least a member of the Board ?

The Hon'ble Minister for Education is concerned only with the Engineering Colleges and the Department of Education is not equipped to supervise and control Engineering Education. Moreover, the Engineering Colleges train personnel intended for all development programmes and not merely to satisfy the requirements of the Public Works Department which is not certainly in a position to assess the needs of the other nation-building activities. Therefore, it is necessary that the whole system of technical training including the Engineering section should be under one Department and under the control of the same Minister. Therefore the following scheme is suggested for consideration.

(1) Technical and Technological Education of all standards including the Engineering section should be under one Ministry, preferably the Ministry in charge of Industries and Planning.

(2) There should be a Director of Technical Education working directly under Government.

(3) There should be a Board of Technical Education (a small body) presided over by the Hon'ble Minister in charge of Technical Education of which the Director of Technical Education will be the Secretary.

(4) This Board will discharge the functions now allotted to the Standing Committee on Technical Education.

(5) This Board may act either as the Technological Diploma Examination Board or set up a small examination board.

(6) The supervision and control of technical and technological institutions of all grades will be under the Director of Technical Education assisted by the present existing staff in the office of the Director of Industries who thereafter will not be responsible for technical education.

R. SURYANARAYANA RAO.

NOTE BY SRI R. SURYANARAYANA RAO, M.L.C. AND BY JANAB MOHAMED ISMAIL SAHIB, M.L.A.

This note deals with some points raised in the Report. In respect of some they are referred to, to emphasize their importance to give additional information while in regard to others to present a different view-point.

POWER.

Everyone recognizes the need for increased power for the development of the Province. In the past, unfortunately emphasize has

often been on the question of yield. It is the fact of usefulness and the assistance it renders for the development of the tract a particular scheme is intended to serve, which must settle its execution. Moreover, supply creates the demand and we need not wait till the demand arises before a scheme is undertaken. If all the projected schemes are carried out, the expansion of industries including iron and steel is possible. It is said the forecast of additional demand under the existing hydro-systems by the end of 1951 is estimated at 124,000 K.W. But if the development of hydro-electric power in the other sites mentioned in the Report is immediately taken on hand, a large quantity of power will be available even if a portion of it is secondary power necessitating some thermal electric plant to utilize the entire resources as primary power.

Iron and Steel.

The possibility of iron and steel industry cannot be ruled out altogether as the Report tries to do. The history of the Bhadravathi Factory has many lessons. The Iron and Steel Factory was located at Bhadravathi as it was centrally situated in regard to supply of ore and fuel. It is true its capacity had to be restricted owing to the use of charcoal instead of coking coal. But with the completion of the Jog Falls Scheme, Mysore has considered the possibility of adopting electrical reduction of the ore and it is proposed to instal electrical furnaces for the reduction of the ore into pig iron and also to increase the steel ingot production. Mysore must have surely planned these post-war developments after examining the economics of production. Moreover, it is difficult to aver with certainty that the use of charcoal as a substitute for coking coal has proved both costly and unsatisfactory. While coking coal would have proved a satisfactory reducing agent, its absence was not a deterring factor for the development of iron and steel industry. Moreover, the cost of charcoal fuel will certainly be less than the cost of imported coal. The Geological Survey has revealed the existence of large quantities of iron ore deposits in Salem, Trichinopoly and Kurnool districts. The iron ore deposits in parts of Salem and Trichinopoly districts are estimated to be in the neighbourhood of 303,650,000 tons and that too mostly at a depth of 100 feet. In actual working they are expected to yield three to four times the quantity. If systematic mapping and survey are undertaken, it is just possible, nay, probable, many more deposits are likely to be found in the region. When deposits are available in sufficient quantities, the point for consideration is whether it should not be possible to start the iron and steel industry in the absence of coal anywhere in South India. The possibility of using charcoal fuel in the initial stages, though not an ideal method, need not be ruled out altogether. Certainly Madras possesses enough forests to secure the charcoal fuel required. Denudation of the forest areas need not be feared as denudation can take place only if regeneration plans are not formulated and carried out. Moreover, if all the hydro-electric schemes on the anvil are undertaken there will be enough

energy to work electric furnaces. The small quantity of coal required even then may be either imported or charcoal can be used instead. The Report says that Madras is not so fortunately situated as the Mysore State in regard to electrical power and the use of power for the iron and steel plant may consume a large percentage of the available energy thereby starving other industries. The present available supply of hydro-electric power is 56,350 K.W. per year. Even if the programme of hydro-electric generation by the year 1951 is just enough to meet the additional demand, the contemplated development of hydro-electric power in the new sites proposed will provide in the neighbourhood of 750,000 K.W. at 60 per cent load factor. Some of these sites may be immediately investigated and work started on them to secure the necessary power for the iron and steel industry. Moreover, it is doubtful if the forecast of demand at the end of 1951 at 124,000 K.W. will prove real. As the iron and steel industry is very important it can be given a high priority over other industries. Therefore, in view of the prospect of improving the supply of hydro-electric energy by further developments of the existing sources as also the possibility of developing new schemes, the fear that the existing industries will be starved is more imaginary than real. Lignite deposits in South Arcot district may also enable us to provide coke necessary for the iron and steel industry even if the power generated will fall short of our demand and the use of charcoal fuel to the extent necessary is found to be uneconomic. Taking into account all the factors, the prospects of the iron and steel industry are bright and the use of charcoal or of electricity or both is as good a practical proposition as the development of any other industry and the establishment of the iron and steel industry can be taken up even as a short-term proposition. We feel the difficulties for starting the iron and steel industry have been unnecessarily exaggerated and the experience gained in Mysore must convince any unprejudiced observer that a plant even bigger than that of Mysore can be successfully worked. The circumstances in our Province taking all factors into consideration are more favourable.

Heavy Chemicals.

Sulphuric acid.—In view of the growing demand for sulphuric acid and as it is doubtful if the projected plants for its preparation owing to various difficulties will come into existence, it is necessary for Government even to take the initiative in setting up a plant. The possibility of manufacturing sulphuric acid from gypsum should be further explored so that the large gypsum deposits available may be used for the purpose. As yet the process of manufacturing sulphuric acid and sulphur from gypsum is not a well-standardized process. It is necessary also for Government to undertake quantitative survey of gypsum deposits as it is found that the output of gypsum mined is increasing. Better methods of mining the gypsum deposits may be thought of so that we can find utmost use for the gypsum deposits available in the Province.

Sulphates and sulphur compounds are manufactured to a limited extent and they are not enough to satisfy the requirements of the Province. If the manufacture of sulphuric acid is established it should be possible to manufacture sulphates and other sulphur compounds to meet the demand which exists for them in this Province.

Alkali industries.—Common salt is an essential raw material in the alkali industry. Taking caustic soda alone, nearly 1½ tons of common salt is required to produce 1 ton of caustic soda. If the production of caustic soda is to be increased, more common salt of good quality should be made available. Madras has an extensive sea coast and salt being a preponderant mineral constituent of sea water, its manufacture in large quantities should be possible. Improved methods of manufacture will ensure adequate supply of pure salt at reasonable prices for industrial purposes. It is understood that in 1946–47 the total output of salt was 131·74 lakhs of maunds while the total issues amounted to 149·43 lakhs of maunds which was made up of outstanding stocks of the previous year as also the imported stuff from Bombay. Madras need not depend on imported salt at all for securing the required quantity for her consumption. The Government of Madras should take necessary steps to manufacture adequate quantities of good salt at reasonable prices required for consumption and for industrial purposes.

Lime.—Lime is another important raw material for the development of alkali industry. At present we lack complete information regarding the existence of limestone deposits, their quality and quantity, their location, etc. All this should be made available to those interested in starting industries in which lime plays an important part. Moreover, such lime as is available is not always of good quality and so the resultant products in which lime is used are not of standard quality. Modern processes should be adopted to produce lime of good quality. The Government should assist the production of high grade lime.

Caustic soda.—If the production of caustic soda is to be accelerated, availability of cheap power should be ensured. The increase of production in the existing plants and the success of the projected ventures will largely depend on the supply of cheap power. The determining factor for the success of this industry is the supply of cheap power. The Panel Report on Heavy Chemicals also emphasizes the need for cheap power as 3,500 K.W.H. will be required for the manufacture of one ton of caustic soda. Therefore, it is not surprising that the then Director of Industries (Mr. Green) emphasized this fact when he wrote long ago ' it is hoped that with the low rate at which Government have agreed to supply electricity, the production cost of caustic soda will compare favourably with that in the industrial countries of Europe and America, where the alkali industry has been developed '. It should be the endeavour of Government to supply power as cheap as possible to ensure the success of this important industry.

Soda ash.—This is not only an important chemical for several industries but also it is used for the preparation of caustic soda by what is known as the causticising process. This process is recommended because of the difficulty of finding use for the large quantity of chlorine that will be released by the process of electrolysis of brine adopted for the manufacture of caustic soda. Therefore, in fixing the target of production of soda ash this aspect should also be borne in mind.

The cost of soda ash plants even in pre-war days was fairly high, working out to Rs. 1,10,000 per ton per day according to the late Mr. Kapilram, vakil, and on this basis, the pre-war price for plants of total production capacity of 160,000 tons per year or about 530 tons per day would be nearly Rs. 6 crores. The present cost would probably be more. Therefore, its installation will be beyond the capacity of private industrialists without active interest of and support from the Government. Even the technical advice and guidance necessary will have to be provided for by the State.

Other chemicals.—There are other chemicals such as calcium chloride, calcium carbide, potassium chlorate, hydro-chloric acid, etc., which are consumed in this Province in a lesser degree. The demand does not warrant setting up of plants mainly for the manufacture of these chemicals. We understand the Mettur Chemical and Industrial Corporation, Limited, was at one time manufacturing potassium chlorate, calcium chloride, sodium sulphide, barium chloride and chlorate, barium carbonate, stannic chloride, strantium hydroxide and barium hydroxide. The manufacture of these chemicals is not being pursued as the cost of the production was high and the return was poor. The National Chemicals, Limited, Masulipatam, possess facilities for manufacturing—

(*a*) Sodium acetate;
(*b*) Potassium permanganate;
(*c*) Acetone.
(*d*) Sodium chloride.
(*e*) Table salt.
(*f*) Potassium acetate.
(*g*) Barium sulphide.
(*h*) Manganese-di-oxide.
(*i*) Nicotine sulphate.
(*j*) Calcium carbonate.
(*k*) Red oxide of iron.

In this case also what facilities they need to continue to manufacture these chemicals in competition with imported stuff should be ascertained and provided for. We recommend this aspect of the matter requires examination. We feel it is even worthwhile to assist these and others, if any, which possess facilities for manufac-

turing these and other chemicals though in small quantities so that at least as far as this Province is concerned we may reach a stage of self-sufficiency.

Acetic acid.—The manufacture of power alcohol from surplus molasses has been dealt with in the chapter dealing with sugar and the allied industries. We wish to emphasise again the importance of alcohol for various industries such as ether, chloroform, acetic acid, pharmaceutical preparations, varnishes, etc. But here we would like to refer to the preparation of acetic acid. Acetic acid is at presnt obtained from a wood-distillation plant and owing to the high cost of wood, the cost of production is high and it cannot compete with the synthetic acid. In view of the proposed rayon manufacture there will be greater use for acetic acid. We would strongly recommend that the manufacture of acetic acid may be taken up in distilleries attached to sugar factories and necessary assistance may be rendered to them for the purpose.

Fertilizers.

Various estimates have been made in the past of the available manures in the Province and the manurial deficiency that exists. Taking into account only the existing yields and not the contemplated increases, it is estimated the deficiency is as much as 700,000 tons of nitrogen per annum. To make up this nitrogenous deficiency it is estimated 3,500,000 tons of sulphate of ammonia will be required on the basis that ammonium sulphate contains a little over 21 per cent of nitrogen. To arrive at the effective demand for this manure, we feel it is enough for our purpose if we only take into account the existing major deltaic areas alone. This does not mean we do not consider that other areas especially those which enjoy protected water-supply should be left out of account. Their need for manure is perhaps as great as the deltaic areas and if circumstances are propitious the supply needed by these areas as well should be assured. However, for the present to arrive at the minimum target of supply required and that too in the near future we have for convenience taken into consideration the needs of delta areas only. The figures of areas already under cultivation in major deltas is as follows :—

	Acs.
Cauvery	772,400
Godavari	819,940
Kistna	910,669
Periyar	134,326
Cauvery-Mettur Project ...	172,719
	2,810,054

At the rate of 100 lb. per acre, the total quantity of ammonium sulphate required will be 125,450 tons. The Director of Agriculture estimates that at least 200,000 tons are required for increasing our food production. We are inclined to accept his estimate as it evidently relates to the use of manure in all areas and not merely in deltaic areas. This Province imported the following quantities of ammonium sulphate :—

		Through Agricultural department—
	TONS.	TONS.
1943–44	5,350	4,198
1944–45	27,600	20,825
1945–46	66,300	24,585
1946–47	70,000	26,955

It will be seen large quantities are imported every year by agencies other than the Agricultural Department. These agencies use the manufacture for preparing mixtures for potato and tobacco crops as also for re-exporting to the neighbouring States of Mysore, Travancore, Cochin and Coorg. Practically only one-third of the quantity imported is available for use in this Province for food production.

The productive capacity of the Government of India's plant at Sindri in Bihar is 350,000 tons per annum and the factory is expected to go into production in 1949. The Government of Madras will secure 25,000 tons per annum for a minimum period of five years. The share of the Government of Madras in the production of Alwaye factory will be 20,000 tons, making a total of 45,000 tons of the fertilizer for five years after the commencement of commercial production in Bihar and Travancore factories available for the use of the ryots of this Province. If we take the needs of delta areas alone, the deficit will be in the neighbourhood of 80,000 tons and it will increase to 155,000 tons if the estimate of the Director of Agriculture is taken into account. We are also not sure the estimate of the Director of Agriculture has been arrived at after taking into account the contemplated increases in the extent of land to be brought under cultivation when various projects under ' Grow More Food ' and other schemes are completed. Therefore, we are greatly impressed by the recommendation of the Sub-Committee on Chemicals Industries Sub-Committee of the Post-War Reconstruction Committee which runs as follows :—

" The sub-committee discussed the need for developing the sulphate of ammonia industry in this Province. As Madras has all along been a large market for ammonium sulphate and as the raw materials necessary to manufacture it are available in this Province, the sub-committee was unanimously of the view that a factory for the manufacture of sulphate of ammonia should be established in the South."

If no steps are taken to give effect to this recommendation, the Province will have to depend either for a major portion of her needs on imports from foreign countries obtained at high cost or allow the food production of the Province to suffer. It is doubtful if our requirements can ever be met by imports which have come down considerably and we have to depend on the Pool for allotment. The choice is between self-sufficiency or dependence. The raw materials required for the manufacture of sulphate of ammonia will depend on the process adopted. However, a systematic and immediate survey of the raw materials should be undertaken without any further lapse of time.

Other chemical manures.—Superphosphate is an important manure which supplies phosphoric acid. It is estimated that concentrated super-phosphate contains about 43 per cent of phosphoric acid. The raw materials at present used in this Province for the manufacture of superphosphate are bones and sulphuric acid. There are three firms manufacturing this manure, the largest production being about 1,500 tons per annum by Messrs. Parry & Co. It is suggested that the phosphatic nodules available in Trichinopoly district can be usefully substituted for bones and the resultant will be equally good. In fact the preparation of superphosphate by treating bones with sulphuric acid is considered as a wasteful method since the other constituents of bones such as glue, gelatine, grease and fat are lost. Unless facilities for recovering these valuable constituents are made available this method should not be encouraged. Moreover, the quantity of bones actually collected including that exported may not be sufficient to produce the required quantity of superphosphates. The Panel Report fixes the target of 100,000 tons per annum as the minimum need. In our opinion the target figure is too low as compared even with the requirements of Madras.

We understand that as a result of researches conducted in the Indian Institute of Science, Bangalore, a process known as the 'Bangalore Process' has been evolved for the manufacture of superphosphate from Trichinopoly phosphatic nodules. The chief merit of this process is the elimination of the use of sulphuric acid.

The Panel Report also suggests the manufacture of superphosphate of low concentration by the thermal process utilizing the deposits of phosphatic nodules available in Trichinopoly district. Though the use of electro-thermal process for the manufacture of concentrated phosphates is considered technically difficult, we understand that by eliminating the use of sulphuric acid the cost of production will be considerably less.

We do not propose to deal with other chemical manures as they have not been in use in this country. Nor have their production even on a small scale been attempted. But the use of ammonium phosphate presents some attraction as this manure supplies both

nitrogen and phosphorus to the soils. Ammophos, as the abbreviated name under which it is known in the commercial world, contains 16 per cent nitrogen and 21 per cent of phosphoric acid, we also find that Madras has been importing some quantities :

	Tons.
1944–45	3,000
1945–46	2,380
1946–47	5,990
1947–48	7,500*

* (estimate of forecast)

The process used for manufacture of this manure is said to be identical in principle with that for sulphate of ammonia but that instead of using sulphur or that derived from gypsum phosphoric acid is used. But doubts have been expressed how far this manure is suited to India with a variety of soils requiring varied proportions of nitrogen and phosphorus. So there appears to be a decided advantage in making sulphate of ammonia and superphosphates separately and using them as the necessities of the soil demand instead of resorting to the use of a compound fertilizer like the ammonium phosphate. However, we would like further field experiments being carried out before ruling out the use of this fertilizer altogether. If the experiments produce satisfactory results, there should be no hesitation in setting up a factory for the purpose to supplement the other manures available and satisfy the manurial requirements of the Province.

While we agree with the recommendation for the immediate constitution of a committee of experts to determine a scientific manurial policy of the Province and the steps to be taken to increase the supplies of manures and fertilizers, we feel the experience already gained in the Government farms and the ryots' lands affords sufficient guidance to frame an immediate working plan. The forecast of the manurial requirements prepared by the Department of Agriculture on the basis of which fertilizers are obtained shows that the fertilizers most in use are the sulphate of ammonia, ammonium phosphate and super-phosphate. As the Report rightly says that fertilizers are complementary to manures; but the danger of exhausting the soil by too liberal application of fertilizers, even if it were true, is more imaginary than real. The cost of fertilizers even when their sale is subsidized, is so high no cultivator, if he possibly can, will prefer them to manures. It is to make up the deficiency in manures he resorts to fertilizers and that too when the price is within his means. By force of circumstances he is forced to make judicious use of fertilizers. The

following extract from the statement of Dr. Emil Truog, Professor of Soils in the University of Wisconsin—from *Soil Conservation*, official organ of the United States Department of Agriculture about the use of fertilizers may be read with interest :—

" Much ado is being made to-day about the great importance of soil organic matter in relation to soil fertility, soil conservation and crops of satisfactory nutritive value. This, in part, is as it should be, because soil organic matter is of tremendous importance. It facilitates the intake of water and thus reduces run-off and erosion. It also favours workability or ease of cultivation, seration, and drainage. Fresh organic matter contains all of the elements needed for plant growth, which, as decomposition proceeds, are released in forms suitable for new plant growth.

However, to say that chemical fertilizers such as superphosphate and muriate of potash should not be used to make up inevitable deficiencies of nutrient elements that cannot be supplied through the use of organic matter is just pure ' bunkum.' Absolutely no evidence exists to the effect that the judicious use of mineral fertilizers is at all injurious to soils, or tends to produce crops which are unsatisfactory as feed for animals or food for man. In fact, evidence, almost without end, now exists showing clearly that the use of mineral fertilizers on depleted soils promotes the growth of crops which have superior nutritive values."

Textiles.

The Chapter on textiles contains many statements to which we cannot subscribe. It is stated that " after providing the demand arising from the handlooms working in these areas, an appreciable quantity of yarn in the lower counts is available for export to other Provinces. On the introduction of the yarn and cloth controls in 1943, the Madras Province was declared a ' surplus ' area for yarn and about 55 per cent of the surplus ' free ' yarn was earmarked for export to the rest of India." From the statements furnished to the Legislature when the agitation for the surrender of spindles was on and the cloth position was under discussion, it will be seen that as far as Madras is concerned, it is not a ' surplus ' area for yarn. There are now 55 mills in the Province producing roughly about 38,400 bales of yarn (1 bale equals 400 lb.). Deducting the yarn used by the composite weaving mills, power looms and hosiery factories, the quantity available for handlooms will be about 28,400 bales per month. Under the All-India yarn distribution scheme, Madras was allotted 21,305 bales which gave work only for ten days in a month for 496,000 handlooms. Even if all the yarn produced in the Province is retained, it will not suffice to give work for thirty days for all the handlooms. The quantity required will be at least 64,000 bales per month. Let it be remembered that this estimate is based on the assumption that there will be no increase in handlooms, powerlooms and hosiery

factories. Therefore, it is clear our production of yarn must be increased three-fold. It is computed even if all the spindles allotted are utilized, we shall still be short of supply of yarn by 12,000 bales per month. Madras will continue to be a ' deficit ' area unless more spindles are allotted. Madras should provide for export quota also. Therefore, Madras will be justified in asking for more spindles.

In regard to position of cloth also, we are placed no better. The total cloth required for the 53 millions of our population at 16·5 yards per capita per annum will be about 47,258 bales per month (1 bale equals 1,500 yards). At present composite mills produce about 6,000 bales per month and our handlooms contribute as much as 24,000 bales. Therefore, we have to make good either by increased production or imports about 17,000 bales per month even to meet the needs of the existing population with a low per capita consumption of 16·5 yards per annum. This 16·5 yards is comparatively low will be evident from the fact that the Post-war Planning Committee fixes the target at 18 yards while the National Planning Committee considers 30 yards as the minimum requirement.

The facts mentioned above show how much lee-way there is both in regard to the demand for yarn and the production of cloth to be made up. On what basis the Report says that ' without any radical change the mill industry in South India with the additions anticipated in the next year or two, can give enough yarn to assure us 18·8 yards per capita ' and that ' the total yarn spun in South India to-day will enable cloth (whether mill-made or handloom woven) of 944 million yards to be woven which should give per capita consumption of 14·8 yards ' and ' that the production of the new units would add a further four yards,' we are not able to understand. At least as far as Madras is concerned the figures given above show what the actual position is.

The Report is not fair to the handloom weaver when it indulges in remarks not borne out by facts in regard to the yarn available for his use. The demand for more yarn is warranted is evident from the figures already quoted. Dr. B. V. Narayanaswami Nayudu's Report on Labour conditions in handloom industry also pleads that every effort should be made to increase the supply of yarn to handloom weavers which will provide employment to the weavers for at least 24 days so that the wages of weavers may fall automatically. The handloom weaver is forced to put up prices as he gets work only for ten days and he has to live for thirty days on the earnings of ten days. Moreover, any unmerited aspersion on the handloom weaver comes with ill-grace from the protagonists of mill cloth industry whose profits in the past have run into fabulous sums but now pretend to be hard hit on the ground the industry cannot bear the demands of labour considered fair by the Industrial Tribunal which went thoroughly into the whole

question. However, it is some consolation that the Report, biassed as it is in favour of mills, does not rule out handloom industry altogether and opines that there is scope both for the mills and the handloom industry to work side by side but within their own limits. What those limits are and how they should be demarcated have not been dealt with. There was no need to enter into a disquisition on the handloom industry, the topic being outside the terms of reference; but having ventured to deal with it the question could have been considered thoroughly in fairness to all interests.

As regards the use of cottons grown in the Province a comparative study of the output and consumption of certain varieties is of interest.

	Yield in bales.	Consumption.
1 (*a*) Cambodia	147,710	275,748
(*b*) Tinnevelly	131,450	
	279,160	
2 Westerns/Northerns	83,640	65,156
3 Cocanada/Warangal	15,780	5,279

Production of other varieties is too small to deserve notice. But from the statement enclosed to the chapter on Textiles it is seen consumption of Indian cotton by mills in South Zone during 1946–47 was 563,206 bales. For purposes of comparison the consumption figures for Madras alone are not available while production figures relate to this Province. Even then there is no denying the fact that it would be suicidal to restrict growth of cotton. In fact every effort should be made to increase its production and that too of better varieties to reach self-sufficiency. The Department of Agriculture should give its immediate attention to this aspect of its work. As the yield of cotton under irrigated conditions is much more satisfactory both in regard to quality and quantity, efforts should be made to introduce better varieties of cotton in the various project areas in the Province. We have no doubt this matter also will be gone into and effective steps taken by the Department of Agriculture.

NOTE.—Since we wrote our 'dissent' on Textiles, we have seen figures of yarn and cloth production as given in the Bombay Cotton Annual for 1944–45 from which we find our plea that Madras is not a 'surplus' area in regard to yarn production and that the cloth position is equally bad is fully borne out.

	Bales per month. Rs.
A. Yarn position—	
1 Existing production of yarn by the mills in the Province as per Bombay Cotton Annual, 1944–45 ..	47,129
2 *Deduct* fall in productions by 1/9ths due to reduction in hours of work	5,237
	41,892
3 *Deduct* yarn used by composite mills, power looms hosiery factories, etc.	6,495

			Bales per month.
			RS.
A. Yarn position—			
4	Balance available for handlooms		35,397
5	Estimated quantity of yarn required for 496,000 handlooms for 360 work days		57,483
6	Deficiency in yarn to be made good		22,086
7	Yarn available if allotted spindles are utilized ..		10,766
8	Net deficiency experienced even after allowing expansion of old mills and erection of new mills		11,320
B. Cloth position—			
1	Cloth required at 16·5 yards per capita per annum for 53 millions of population		47,258
		RS.	RS.
2	(*a*) Cloth from composite mills after deducting for loss due to reduction in hours of work ..	6,097	30,104
	(*b*) Handloom production	24,007	
3	Deficiency to be made good	..	17,154

It will be seen these deductions approximate to those given by us with the help of figures supplied to the Legislature.

SUGAR INDUSTRY.

On the expansion of sugar industry, we wish to mention a few points. The total consumption of sugar in the Province is 90,000 tons as against the present production of 47,445 tons and the per capita consumption calculated on a population basis of 48 millions is 3·4 pounds. It would be much less if the population is taken as 53 millions, the figure now accepted in many estimates. Nor is the consumption of gur any better. Not only to make up the existing deficit in consumption of sugar which is roughly about 43,000 tons but also to provide for increased consumption which the increased population as also increased normal consumption demand the Government of India sanctioned six new factories in Madras each with an annual capacity of about 10,000 to 12,000 tons. But the Madras Government sanctioned the establishment of nine new factories with a daily cane crushing capacity ranging from 400 to 650 tons. It is understood that the existing factories are also allowed to expand enabling them to produce about 84,000 tons per annum thus reducing the deficit on the basis of present consumption. The report does not take into account this expansion in the existing factories when it states that with the proposed new factories sanctioned by the Government we should be able to make up the present deficiency of 43,000 tons. If the premises in the report are accepted, there is no need for new factories at all. It appears the majority of my colleagues are somewhat obsessed with the idea that more consumption of sugar is not necessary and that further extension of sugarcane cultivation would affect the production of food crops. Judged by standards of consumption of sugar in other parts of the world and even in other provinces in India, ours is miserably poor. Nutrition experts suggest greater consumption. Taking all these factors into consideration the sugar panel fixed our quota at 150,000 tons. The expanded production in the existing factories as sanctioned by Government

as also that of the new factories will still leave a gap of 23,000 tons which must be made up. This can be done either by permitting further expansion of the existing factories where facilities exist to increase their crushing capacity up to 800 tons or increase the crushing capacity of the proposed new factories or as a third alternative allow more small units to be set up. This raises the question what should be the minimum size of a sugar factory. Taking into account all factors the Government of India seem to have commended that all factories should be of 800 tons crushing capacity per day. It is understood other provinces have accepted this and are arranging to see that all their factories are all of this minimum size. We do not know why Madras alone does not agree with this recommendation. As the minimum size of a factory is of great importance for the success of any industry, we would suggest this matter should be re-examined so that if a decision is reached it may be applicable when the question of fresh allotment or re-allotment comes up sooner or later.

We cannot subscribe to the view of the majority of our colleagues when they state that as power alcohol has a strategic value its production should be in the hands of Government. This is not feasible as molasses have all to be gathered and taken to central distilleries along long distances as the sugar factories are distributed all over the province. Transport charges will unnecessarily increase the cost of production. But the production of power alcohol can be encouraged under controlled conditions as even now manufacture of country spirit from molasses is permitted. It is just possible all the factories may not apply for permission to put up plants for the manufacture of power alcohol. But usually no factory with a crushing capacity of less than 800 tons can afford to put up a power alcohol plant which costs about Rs. 7 to Rs. 10 lakhs. As stated by Mr. Armstrong of Messrs. Parry and Company, in his oral evidence before the committee the factories will undertake production of power alcohol if the Government announce their policy regarding prices and excise duty and also give an undertaking that they would take over the production at least for a fixed number of years. In his opinion at least a fixed profit of 10 per cent should be assured over the cost of production. In view of the growing demand for petrol it is worth while for Government to examine the prospects of production of power alcohol and come to some terms with the producers. Assured of their market, some sugar factories may be prepared to invest capital. According to Mr. Armstrong molasses form 5 per cent of the cane and one ton of molasses will give 60 gallons of power alcohol and that one gallon of it would cost 12 annas. The whole question of manufacture of power alcohol needs immediate attention.

LOCATION OF INDUSTRIES.

There are some statements made in Chapter II of the report to which we are unable to subscribe. In paragraph 16 it is argued that many of the evils of modern industry are due to the

segregation of industrial workers in labour colonies and the reservation of industrial areas. While this may be a view point for consideration with a view to avoid evils of overcrowding it is not wholly acceptable. It is an accepted fact that absenteeism and late coming are due to the circumstance that for want of housing facilities near their places of work, the workers are forced to live often far away from their places of work and in the absence of adequate transport facilities they are not able to reach the work spots in time. Moreover, they are compelled to live in very unhealthy surroundings paying uneconomic rents without corresponding advantages. It is in the interests of the industry that the workers should be provided with decent houses and as far as possible near their places of work. It has, therefore, been maintained that the provision of housing facilities is an obligation which the employers are required to discharge. This obligation can be discharged only by the establishment of colonies for workers by employers employed in any particular industrial establishment. Haneypettai in Madura is an instance in point. But where transport facilities are lacking it may be even necessary to establish labour colonies not far from, though not adjacent to, the place of work. The housing of workers employed in the Scindia Steam Navigation Company ship-building yard is an instance of this kind. Therefore, even if it is conceded that many of the evils of modern industry are due to some extent to the segregation of workers in labour colonies, a proposition of doubtful value, there appears to be no escape from the growth of labour colonies where housing accommodation and other amenities are provided by the employers and they being located as far as possible either near their places of work or far away from their places of work where special transport facilities are available.

Then again we cannot subscribe to the view that there is no justification to-day to exclude the location of industries from residential areas on the ground that modern factory technique has succeeded in minimising noise, eliminating smoke, ensuring a clean atmosphere and providing better ventilation and lighting, etc. We doubt very much that even modern factory technique has really succeeded in eliminating all these evils. As the existence of industrial establishments in the midst of residential areas is considered undesirable from the point of view of public health various laws and regulations have been adopted to restrict their establishment. These healthy restrictions are necessary in the larger interests of the community and must be enforced. We cannot also subscribe to the sentiment contained in the sentence; 'From another point of view if we can afford to risk the health of the people who work inside the factory, why should we be so zealous about protecting those living outside the factory from minor discomforts.' First of all, no one is anxious that even the health of the people inside the factory should be risked. Various factory laws and regulations promulgated and enforced are intended to

minimize, if not entirely ward off, all risks. Even if such risks persist in spite of the enforcement of regulations, it cannot be contended that on that account risks to the health of the community need not be emphasised. Nor is it fair to say that the existence of factories with all their attendant evils cause only 'minor discomforts'. However, this question of location of industries about which so much has been written in the report is of academic interest just at present as their location even in residential areas if resorted to is dependent on the perfection and adoption of modern factory technique. We have yet to accomplish this to eliminate all the evils.

Report of the Royal Commission on the Distribution of the Industrial Population (1940) is of absorbing interest. The whole report is full of facts and figures which have a bearing on the points raised in this report on the question of location of industries. Exigencies of space prevent us from dealing with the report at some length. For our purpose it is enough to draw attention to the following paragraphs dealing with the effects of smoke and noise which conclusively prove the necessity to create industrial areas as distinguished from residential areas :—

"154. The adverse effects of smoke upon health were emphasised in evidence by the Registrar-General for England and Wales. The urban medical officers of health also stressed, in the information which they supplied to the Joint Medical Committee, the relation between a smoky atmosphere and respiratory diseases, and some of them referred to the effect of smoke in diminishing the quantity of actinic rays which reach the town dweller, thereby contributing to the development of rickets.

155. One of the medical officers of health went so far as to state that the lack of success in controlling smoke was 'the great failure of modern public health'. It may be that this statement does rather less than justice to what has been achieved in the sphere of smoke abatement; for, taking the country as a whole, smoke pollution of the atmosphere is undoubtedly decreasing notwithstanding the fact that there are every year more and more houses and factories requiring heat and power. Nevertheless it is true that smoke pollution still persists to a harmful extent in many large towns. And the adverse effects of smoke are not confined to health. Besides contributing through fog to traffic disorganization, accidents and delays, it is unquestionable that smoke costs the country many millions of pounds a year, quite apart from its detrimental effects on vegetation and the fabric of historic and other buildings.

156. In regard to noise the joint medical committee reported that there was a 'fair unanimity' of opinion among the urban medical officers of health who co-operated in the committee's inquiry that the effects of noise are harmful though difficult to

estimate. Adaptable as the human body may be to its surroundings, it is difficult to believe that the continual din present in the central parts of great cities does not lower the vitality of those persons who are subjected to it day after day.

157. A Commission, which was appointed by the Commissioner of Health in New York City in 1931, issued a report on noise in which the following conclusions were stated :—

(i) Hearing is apt to be impaired in those exposed to constant loud noises.

(ii) Noise interferes seriously with the efficiency of the worker; it lessens attention and makes concentration upon any set task difficult.

(iii) In the attempt to overcome the effects of noise, great strain is put upon the nervous system, leading to neurasthenic and psychasthenic states.

(iv) Noise interferes seriously with sleep, even if a few become tolerant.

(v) The normal development of infants and young children is seriously interfered with by constant loud noises.

158. Unfortunately there is no evidence that noise associated with industrial life is diminishing. There can, however, be no doubt that the population can be protected in large measure from its effect by enlightened town-planning and decentralization. The same is true in regard to smoke. But neither smoke nor noise has regard to local Government boundaries, and if the utmost benefit is to be derived from planning, the planning must proceed by reference to the whole of an area of industrial concentration and a surrounding rural ring, not by reference to the arbitrary divisions into which the area is often split for local Government purposes under the existing structure of local Government."

R. SURYANARAYANA RAO.

M. Md. ISMAIL.

A NOTE BY SRI R. SURYANARAYANA RAO AND SRI B. S. SANJEEVI REDDY.

To the preliminary report we added a note pleading for special consideration for backward areas like the districts of Rayalaseema where possibilities for industrial development are great but the prospect of securing of adequate capital, trained personnel, etc., are not rosy. We commended to Government the adoption of measures such as those formulated in the neighbouring Indian State of Hyderabad. We find now that the creation of regional development corporations to promote industrial development in backward areas has been accepted as the necessary step calculated to achieve the purpose. Therefore, we have no hesitation in reiterating our proposals made earlier and suggest that Government should even take the initiative for the industrial development of Rayalaseema. We learn that in regard to cement industry, the Government have come forward to subscribe for a major portion of the capital required and have also agreed to other concessions subject to conditions, such as those referred to in the report which obtain in the Indian State of Mysore. We strongly plead that such participation and active support of the Government should be extended to all projected industrial enterprises in Rayalaseema to ensure their success. Such help as the proposed industrial financing corporation may offer will not be enough as far as this tract is concerned.

R. SURYANARAYANA RAO.

B. S. SANJEEVI REDDI.

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS.

PRELIMINARY REPORT.

Serial No.		Reference to paragraph.
1	The problem of planning should be confined to ascertaining in what ways the State can help the industrialist either by removing the obstacles in the way of starting an industry or by undertaking such constructive work essential to industry as is beyond the scope of the individual.	8
2	It is not practicable at this stage to initiate a policy of nationalization on a large scale.	14
3	Industries have been classified under the following four heads for the purpose of considering the question of nationalization :— (1) Defence Industries, (2) Industries concerned with the generation of power, (3) Industries connected with transport and communications, and (4) Industries essential to the economic well-being of the people.	
	The first group of industries should be owned and controlled exclusively by the State. As regards the second and third group the majority of the Committee are of the opinion that the scope for private enterprise should not be ruled out in the event of the State not taking the initiative to start them. The fourth group of industries should be left to private enterprise.	15 and 16
4	The Provinces should be given freedom to plan and develop industries within their jurisdiction and the powers which they possess under the Government of India Act, 1935, should be further augmented instead of being taken away from them.	29
5	Location of industries—The disposal of industries among the various districts must be made on the merits of each in relation to the industry.	32
6	The District Industries Officers may undertake the work of preparing handbooks regarding the potentialities of industry within their area in conjunction with the municipalities and local boards.	34
7	The Provincial Government should undertake legislation for taking power for licensing the starting and expansion of industries. The legislation should provide for the establishment of six Regional Advisory Boards and a Provincial Advisory Board.	35 and 36
8	The Provincial Government should establish immediately Production Boards to exercise control over the production of industries such as textiles, cement, sugar, vanaspathi, building materials, etc.	37
9	A Geological Survey is a necessary pre-requisite for the proper development of industries in this Province.	44
10	All essential minerals should be nationalized.	46 (1)
11	All strategic minerals should be wholly left to the control of the centre for development.	46 (2)
12	All other minerals should be under the control of the Provinces and the States.	46 (3)
13	Branches or units of the Geological Department of India should be set up in every Province.	46 (4)
14	Provincial laboratories should be established.	46 (5)
15	The Provincial Governments and States should be free to employ foreign Geological experts and technicians to supplement any survey or undertake investigation of particular minerals in their area.	46 (6)
16	A Conference of Provincial Governments with Central Government representatives should be held to implement these recommendatoins.	46

Serial No.		Reference to paragraph.
17	There should be sanity in wage demands—The raising of wage level beyond reasonable limits will only result in rise in the prices of those very commodities which labour themselves largely consume.	49
18	The Provincial Government should undertake legislation on the lines of the " Coal Mines Labour Welfare Fund Act " and make it applicable to all industries.	50
19	The Government should promote harmonious relations between management, executive and labour.	51
20	Division of profit between the management, executive and labour and shareholders in certain proportions.	52
21	Section 4 of the State Aid to the Industries Act should be repealed immediately.	58
22	The Provincial Government should set up a Financial Corporation with at least 2 crores capital with provision to borrow to the extent of ten times its paid up capital.	59
23	The Government should own 51 per cent of the share capital.	60
24	Composition of the Board of Directors and the nature of the management of the Finance Corporation.	62-67
25	A Board of Industries at a high level should be constituted in Madras presided over by the Minister in charge of Industries.	70
26	The Department of Industries should be re-organized.	71
27	The District Industries Officers should be appointed from men who have some previous industrial experience or who have undergone industries training.	72
28	' Industries ' and ' Industrial Planning ' should be dealt with in one and the same department of the Secretariat.	73
29	It will be necessary to institute a provincial apprenticeship programme by means of legislation.	77
30	The drawing up of a detailed programme should be entrusted to a Committee.	78

FINAL REPORT.

31	With the limited scope for the Industrial Development that is open to our Province priority should be given to industries which directly or indirectly assist agricultural operations.	Chapter II paragraph 9.
32	Industries cannot spring up unless conditions favourable for their establishment already exist.	Paragraph 10.
33	The economy of the Province can be solved only by more production.	Paragraph 11.
34	The exploitation of the natural resources of the Province should be restricted to purposes which are strictly essential to the Provincial economy.	Paragraph 13.
35	In the industrial frame work of the Province there should be a very large percentage of small industries.	Paragraph 14.
36	The Mysore system of management of industrial concerns should be adopted with as few modifications as possible.	Paragraph 18.
37	The managing agency system should be abolished.	Paragraph 19.
38	Standardization of products and the establishment of an Institute for the purpose.	Paragraph 20.
39	A departmental store with branches all over the Province should be set up to assist in the distribution of all local products.	Paragraph 21.
40	The plans for the development of the Madras Province must be co-ordinated with those of Mysore, Travancore and Cochin and for this purpose a conference should be summoned.	Paragraph 22.

Serial No.		Reference to paragraph.
41	The Government should sponsor trade delegations to foreign countries in order to explore the possibilities of inter-commerce.	Chapter II—*cont.* Paragraph 25.
42	The Government should see that all industries for which permission has been given start production. If some licensees are not able to make production, their licences should be cancelled and re-allotted to others.	Paragraph 28.
43	Immediate arrangements should be made to install a number of thermal units in places where new industries are proposed to be started.	Chapter III, paragraph 33.
44	New power development schemes should be taken up for immediate investigation.	Paragraph 33.
45	'Nursery Power Stations' should be established to help rural and agricultural development including development of cottage industries and to build up load gradually for the purpose of grid power supply.	Paragraph 35.
46	The development of the electrical resources of the Madras Province must be co-ordinated with those of the adjacent States of Mysore, Travancore and Cochin and at a later time with the systems of Orissa and Hyderabad.	Paragraph 37.
47	A careful wind survey to locate the principal wind cells should be undertaken.	Paragraph 40.
48	A Power Board should be constituted for this Province ..	Paragraph 41.
49	The question of railway freight rates should be immediately investigated and revised.	Chapter IV, paragraph 47.
50	Adequate warehouses should be provided	Paragraph 50 (1).
51	Special type wagons should be introduced	Paragraph 50 (2).
52	The system of using boxed type of wagon body now in vogue in United States of America should be adopted in India.	Paragraph 50 (3).
53	Improvement and extension to marshalling yards should be made.	Paragraph 50 (4).
54	Pneumatic tyred and sprung vehicles for draught animals should be largely manufactured in this Province.	Paragraph 52.
55	The Road Development Programme of the Government should be speeded up.	Paragraph 53.
56	The Government of Madras should obtain the services of canal experts either from Holland or Germany to make a study of canal systems and report in the ways and means of making them serve not merely the purpose of industry but of general trade as well.	Paragraph 54.
57	A fleet of country craft vessels should be organized under proper authority preferably through co-operative organizations.	Paragraph 55.
58	The Government should have a fleet of lighter craft to operate the entire length of the Madras Province and also between other ports in India.	Paragraph 57.
59	Minor ports should be developed	Paragraph 58.
60	Sea traffic should be handled on competitive basis and not on monopolistic basis.	Paragraph 59.
61	The Madras Government should encourage the starting of aircraft service to serve the interior and other regions.	Paragraph 60.

Serial No.		Reference to paragraph.
62	The Government of India shoud be requested to find the expert personnel required for the lignite investigation in the South Arcot district.	Chapter V, paragraph 61.
63	A Mining Engineer, an Electrical Engineer and an Industrial Chemist should in collaboration with foreign experts investigate the best way of mining and utilizing the lignite.	Paragraphs 64 and 65.
64	The Panchayat Forests should be taken over by the Government immediately.	Chapter VI, paragraph 67.
65	A Forest Research Institute should be established as an adjunct to the Forest College at Coimbatore.	Paragraph 69.
66	Saw mills and depots should be established in suitable places.	Paragraph 70.
67	The Government may usefully enquire into the causes of the failure of the Rajahmundry Paper Mills.	Paragraph 72.
68	The Government should undertake production of all varieties of pulp and regulate its supply to newsprint manufacture and other industries.	Paragraph 73.
69	A gas producer plant should be installed in the Madras City in the first instance and its extension to other urban areas considered later.	Paragraph 74.
70	Instead of transporting the wattle bark from the plantation to the tanneries, arrangements to separate the tanning extract near the plantations and transport it to the tannery should be made.	Paragraph 75.
71	Arrangements should be made for the sale of sandalwood to the factories in the Province at suitable prices.	Paragraph 77.
72	The extraction of Khus Oil should be developed under Government auspices.	Paragraph 78.
73	The cultivation of grass should be taken up at least in limited areas in the neighbourhood of dairy farms.	Paragraph 79.
74	Investigation should be immediately taken on hand by the Forest Department to see what minor products are available in the forest and what industries could be best started to utilize them.	Paragraph 80.
75	A Forest Industries Development Officer should be appointed to be in charge of the Forest Research Institute.	Paragraph 81.
76	The functions of the Forest Utilization Officer should be co-ordinated with those of the Special Forest Development Officer.	Paragraph 82
77	The establishment of an iron and steel industry in the Madras Province as a short-term proposition is not feasible.	Chapter VII, paragraphs 85–87.
78	The location of two steel rolling mills with electrical furnaces in this Province should be considered.	Paragraph 88.
79	The Government should constitute a Committee of experts having experience of steel industry to examine the suggestions for the utilization of scrap.	Paragraph 90.
80	Early steps should be taken for a thorough investigation of the possibilities of having a copper mining industry in this Province.	Chapter VIII, paragraph 92.
81	The production of aluminium from the Shevaroy's Bauxite cannot be thought of as a short term industry.	Paragraph 94.
82	The Madras Government may own an interest in the Indian Aluminium Company, Alwaye.	Paragraph 94.
83	Investigations into the deposits of lead ore in this Province should be taken on hand immediately and a factory should be established for making white lead from imported lead metal.	Paragraph 96.

Serial No.		Reference to paragraph.
84	As a long range plan an industry for the extraction of magnesium metal either from magnesite or from magnesium salts should be started.	Chapter VIII —*cont.* paragraph 97.
85	A dry cell manufacturing industry using pyrolusite after processing should be started.	Paragraph 98.
86	The export of Beryllium should be controlled	Paragraph 99.
87	There is no need to make electrical generators on a Provincial basis. A central factory may be established in the Mysore State in which the Madras and other State Governments would be jointly interested.	Chapter IX, paragraph 104.
88	A factory may be located in Madras or in Coimbatore for the manufacture of motors.	Paragraph 105.
89	A transformer factory may be established either at Mettur or elsewhere where facilities exist.	Paragraph 106.
90	A factory for the production of electric cables and wires may be set up at Madras.	Paragraph 107.
91	A factory for the manufacture of switch gear and accessories may be located at Madras.	Paragraphs 108–109.
92	Low tension insulators may be manufactured at the porcelain factory at Nellore. The manufacture of high tension insulators may be undertaken in conjunction with the Mysore and Travancore Governments.	Paragraph 111.
93	The manufacture of house service meters should be taken up as a joint proposition with the Mysore and Travancore Governments.	Paragraph 112.
94	A conference of the existing lamp manufacturers with a view to evolving a scheme for the erection of a central factory for the manufacture of glass shell and to enforce technical standards should be summoned.	Paragraph 113.
95	The Madras Government should seriously interest themselves in the affairs of the Madras Radio and Electricals with a view to start production at the earliest opportunity.	Paragraph 114.
96	A galvanizing plant should be established in the Province ..	Chapter X, paragraph 117.
97	An automobile industry to manufacture light and medium industrial vehicles should be started in Madras.	Paragraph 118.
98	Factories for the manufacture of Prime Mover Units should be started as quickly as possible.	Chapter XI, paragraph 122.
99	The Prime Mover Industry should be left to be organized by private enterprise.	Paragraph 124.
100	General purposes workshops should be started in every district.	Chapter XII, paragraphs 125–129.
101	Out of these District Workshops a few should be selected for specialized work on a regional basis.	Paragraph 132.
102	These workshops should be under private management subject to Government control.	Paragraph 134.

Serial No.		Reference to paragraph.
103	An expert committee should be appointed to draw detailed plans for the establishment of these workshops.	Chapter XII —*cont.* Paragraph 135.
104	The Public Works Department may be asked to restart the manufacture of the bricks.	Chapter XIII, paragraph 139.
105	A survey of the stones quarries should be made and the Government may set the fashion by using stones wherever available in the housing schemes.	Paragraph 140.
106	Investigation should be undertaken to find out the existence of silt deposits on the eastern half of the Province.	Paragraph 141.
107	Government can introduce cut sizes of palmyrah timber into the market for sale along with costlier varieties of timber.	Paragraph 144.
108	Building engineers should frame designs economizing the use of steel.	Paragraph 145.
109	A committee of building engineers should be constituted with a view to greater utilization of local materials and to effect material reduction in building costs.	Paragraph 146.
110	There is no immediate need for more cement factories to be established in this Province.	Chapter XIV, paragraph 147.
111	The manufacture of asbestos cement products could be taken up as a subsidiary industry by utilizing the cement abestos supplies available in this Province.	Paragraph 148.
112	The question of the manufacture of non-standard cement is worth investigation.	Paragraph 149.
113	The manufacture of sorel or white cement from magnesite is another industry which is particularly feasible in this Province.	Paragraph 150.
114	Ultramarine blue is also used in laundry work and in paper manufacture and its manufacture requires investigation.	Chapter XV, paragraph 175.
115	Low grade graphite occurs in the Circars and its utility for paints requires investigation.	Paragraph 176.
116	The production of Butyl alcohol and acetic acid by fermentation of molasses and by manufacture from alcohol require immediate attention.	Paragraph 183.
117	The Geological Department may be asked to make a survey for the clay deposits in the Province and the results of the investigation should be published.	Chapter XVI, paragraph 185.
118	Factories should be located in suitable places in the South Arcot district and in the Andhra districts for the manufacture of stoneware pipes.	Paragraph 186.
119	The services of Japanese experts should be obtained for the factory in the Nellore district.	Paragraph 187.
120	A factory should be established for the manufacture of high class sanitary ware.	Paragraph 187.
121	A large scale industry for the manufacture of refractories should be established.	Paragraph 188.
122	A factory for the manufacture of mirrored glasses should be established in this Province.	Chapter XVII, paragraph 192.

Serial No.		Reference to paragraph.
123	As a short term proposition a plate glass industry near Madras may be established and the existing factories making bottleware and hollowware may be modernized.	Chapter XVII —*cont.* Paragraph 194.
124	The manufacture of bangles should be encouraged ..	Paragraph 195.
125	A sulphuric acid plant with a capacity of one lakh tons should be installed.	Chapter XVIII, paragraph 198.
126	Further installation of Electrolytic alkali plants should be conditioned by definite schemes for the proper utilization of chlorine.	Paragraph 204.
127	The Government should be prepared to assist the Heavy Chemical Industries.	Paragraph 205.
128	It is essential to formulate a scientific manural policy for this Province. For this purpose a Committee of experts should be constituted.	Chapter XIX, paragraphs 207–211.
129	The cultivation of medicinal plants in selected areas in the Hill Stations should be undertaken. Cinchona plantations should be extended.	Chapter XX, paragraph 215.
130	A committee of medical men should be constituted to advise the Government on the preparation of Shark-Liver Oil and Adamin.	Paragraph 216.
131	The manufacture of vitamins and yeast should be undertaken.	Paragraph 217.
132	The King Institute, Guindy, should be expanded	Paragraph 218.
133	It is necessary to start some more units for the manufacture of soap.	Chapter XXI, paragraph 222.
134	Edible oils should not be used in the manufacture of soaps.	Paragraph 223.
135	The economics of production of cotton seed oil and the use of the several products such as linters and cake should be investigated and necessary data made available to the millers so as to encourage the crushing of cotton seed.	Paragraph 224.
136	Large scale production should be resorted to for soap manufacture.	Paragraph 227.
137	The "Continuous Process" method in the manufacture of soap should be adopted in the new factories to be set up.	Paragraph 228.
138	There is scope for the mills and the Handloom Industries to work side by side.	Chapter XXIII, paragraph 246.
139	A factory for the manufacture of pneumatic tyres should be established in the Southern end of the Peninsula.	Chapter XXIV, paragraph 252.
140	Factories for the manufacture of paper should be established in the (1) Tinnevelly district, (2) Ceded districts, (3) Mettur or Wynaad, (4) Rajamundry and (5) Vizagapatam district.	Chapter XXV, paragraph 255.
141	A conference of some of the leading industrialists interested in the paper industry should be convened with a view to rehabilitate the mill at Rajahmundry.	Paragraph 256.
142	The Government should take up investigations for the manufacture of wood pulp.	Paragraph 257.
143	A Committee should be constituted by the Government for preparing a Blue Print for establishing centres of milk production.	Chapter XXVI, paragraph 258.
144	A blue print should be prepared for the development of fishing industry.	Paragraph 259.
145	A Committee should be constituted to inspect the existing biscuit factories in the Province with a view to frame regulations for the imposition of standards of purity and cleanliness in the manufacture of biscuits.	Paragraph 260.

Serial No.		Reference to paragraph.
146	An investigation should be undertaken of the possibilities of manufacturing biscuits or some alternative food product utilizing the available proteins and mineral constituents of groundnut.	Chapter XXVI, —*cont.* Paragraph 260.
147	Flour mills should be established in this Province	Paragraph 262.
148	The process of manufacture and the purity of the coffee powder produced should be controlled by the Government.	Paragraph 263.
149	Until the results of the experiments now in progress are known it will not be desirable to increase the production of Vanaspathi.	Paragraph 264.
150	The extension of area under sugarcane is not desirable	Chapter XXVII, paragraph 268.
151	Further expansion of Sugar Industry should not be permitted.	Paragraph 271.
152	A factory for the manufacture of Pressed Boards from Bagasse should be established.	Chapter XXVIII, paragraph 273.
153	Molasses should be utilized for the production of Power Alcohol as well as the production of Industrial Alcohol.	Paragraph 276.
154	The balance of molasses should be utilized for reclamation of alkali land.	Paragraph 277.
155	Three plants should be set up to serve the whole Province each capable of producing one ton of food yeast.	Paragraph 278.
156	Industries for the manufacture of pencils, pen-holders, nibs, pins, fasteners, carbon paper and ribbon, sewing machines, etc., may be established in the Province on modern lines.	Chapter XXIX paragraphs 279–288.
157	The Industries Department should undergo a complete reorganization.	Chapter XXX, paragraph 298.
158	It is essential that the existing industries should not be neglected and should receive every encouragement and assistance from the Government.	Paragraph 299.
159	The Government should assume the role of chief promoter of industries.	Paragraph 302.

APPENDIX I.

(*See* Chapter I, paragraph 3.)

QUESTIONNAIRE ISSUED BY THE COMMITTEE.

NOTE.—The questions are intended to elicit the views of all persons who are interested in a planned and rapid industrialization of this Province. It is not intended that the answers to questions should be necessarily monosyllabic. The questions have been framed to focus attention on matters on which the Committee considers it essential to assess public opinion. The form of questions need not, therefore, restrict the scope of answers; but it is requested that all answers should, as far as possible, be brief. It should be noted that this Committee is not concerned with cottage industries.

1. What industries, in your opinion, should be started immediately, so as to facilitate the rapid industrialization of this Province? What are the facilities which are available for the starting of such industries?

2. Have you considered the prospects of new industries which could be started and could successfully function in your district? If you have, please send a note on the nature of such industries and classify them into (i) those that can be started and can begin to operate in less than three years and (ii) those the operation of which will take more than three years. Please refer to the facilities which your district offers for the starting of such industries, such as raw materials, capital, skilled and unskilled labour, power, markets, etc. In the list of new industries that can be started specify those which may require less than rupees five lakhs and those which may require more than rupees five lakhs as capital.

3. If you are already interested in the management of any existing industry, please say whether you experience any difficulties in the successful working thereof or in expanding it and how, in your opinion, the Government could help you to overcome them.

4. If you have obtained permission to start a new industry, please say when you expect it to begin functioning and, if you are experiencing delay, the reasons therefor.

5. What are the mineral resources available in your district? Are they being exploited? If not, give reasons for the failure to exploit them.

6. What industries, in your opinion, should be completely nationalized? What criteria would you suggest for nationalization of industries? What industries, do you think, should receive State-aid and what should be left wholly to private enterprise? Do you favour any sort of Governmental control over all industries irrespective of the fact whether they are State-aided or not?

7. Besides giving financial aid, in what other ways can the State accelerate the growth of industries? Can you mention specific industries which stand in need of such help and the nature of the help required?

8. Are you satisfied with the working of the State Aid to Industries Act? Do you suggest any amendments to it? Or, would you prefer the financing of industries to be left to a Finance Corporation? What powers and functions would you suggest for such a Finance Corporation?

9. Would you advise some system of licensing the starting of industries to ensure proper regional distribution and also to prevent the establishment of bogus enterprises?

10. Do you favour the constitution of permanent Regional Industries Boards to be controlled by a Central Board to the Government in planning, regulation and establishment of industries? Would you have such Boards composed entirely of non-officials or officials or partly of both?

11. Would you recommend the imposition of a limitation on the dividend which should be paid to investors in joint stock industrial enterprises?

12. Do you recommend the sharing of profits, after payment of a limited dividend and after provision for reserves, between capital, management, executive and labour? If so, in what proportions? Please give reasons for your answer.

13. Do you favour the establishment of Work Councils in all industries, in which representatives of labour and executive can take part along with the management in discussing questions of common interest?

14. Are you in favour of continuing the present system of Managing Agency, which permits institutional management without requiring personal qualifications?

APPENDIX II.

(Chapter I, paragraph 3.)

SUMMARY OF THE REPLIES TO THE QUESTIONNAIRE.

Q. 1.—What industries, in your opinion, should be started immediately, so as to facilitate the rapid industrialization of this Province? What are the facilities which are available for the starting of such industries.

Q. 2.—Have you considered the prospects of new industries which could be started and could successfully function in your district? If you have, please send a note on the nature of such industries and classify them into (i) those that can be started and can begin to operate in less than three years, and (ii) those the operation of which will take more than three years. Please refer to the facilities which your district offers for the starting of such industries, such as raw materials, capital, skilled and unskilled labour, power, markets, etc. In the list of new industries that can be started specify those which may require less than rupees five lakhs and those which may require more than rupees five lakhs as capital.

Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district: Oil milling and refining, tanning, manufacture of cigars, cigarettes, glass, machinery and textiles are the industries that can be started and expanded here as cheap labour and power are easily available. These industries can be started within three years.

Sri S. Chakrapani, B.A., B.L., *Cuddalore O.T*: The Government should immediately direct their attention towards gasifying the lignite in the mine itself and with the gas obtained should arrange for the running of one or two high voltage thermal stations. Cement, sugar, porcelain and refractories, paper and boards, chemicals and fertilizers can be successfully run in the South Arcot district. Cement, paper and sugar industries will require more than Rs. 5 lakhs capital and the rest may be started with a capital of less than Rs. 5 lakhs.

(1) *Sub-Committee of the Industrial Planning and Development Committee and* (2) *Dr. A. V. Varadaraja Iyengar, Bangalore*: Industries concerning food and foodstuffs, milk and milk products, textiles, fertilizers, manufacture of agricultural implements and other basic industries should be started for rapid industrialization of the Province. Cigarettes, glass and enamel works, textile mills can be started and operated within three years in the Guntur district.

Messrs. C. V. Cheru & Sons, Pattambi, South Malabar: Leather, match sticks and boxes, mining, plantations and pottery industries can be started in the Malabar district within three years with above Rs. 5 lakhs capital.

Mr. P. B. Doraiswami, Industrial Engineer, Chittoor: The pigment industry should be immediately started and the operations can be commenced within three years.

Sri H. Joga Rao, B.Sc., *Radio Engineer, Madras*: Ceramics, glass, wire drawing mills, manufacture of electrical instruments, magnetic and tool steel alloys, non-ferrous alloys and radio parts could be started and worked within three years with over Rs. 5 lakhs as capital.

(1) *Mr. K. A. Joseph*, M. A., *Presidency College, Madras*, (2) *Mr. P. B. Kurup and Mr. P. V. D. Menon, Techno Chemical Industries, Calicut and* (3) *Sri P. N. Menon, Malabar*: Capital goods industries or basic industries like iron and steel, chemicals, machine tool and machinery manufacture should be first established in this Province. Malabar district offers facilities for textiles, coir, fibre, timber and its products, ceramics, chemicals, hydrogenation of oils, dairy farming and other industries which could be started within three years with a capital of more than Rs. 5 lakhs.

Sri A. S. Kuppuswami, Tinnevelly: Industrial alcohol, oil industries, electrical industries, machine and tool making industry, transport machinery, fertilisers, radio and cinematograph industry, spinning mills, cement and leather goods manufacture can be started in the Tinnevelly district.

Sri Y. Mahabaleswarappa, Bellary: Cement, paints textiles and paper industries can be started in the Bellary district within three years with a capital of more than Rs. 5 lakhs.

Sri R. Natarajan, Mylapore: Glass, bell-metal, sugar and leather goods industries should be started for the rapid industrialization of the Province. These industries may be started in the North Arcot district.

Sri P. A. Palaniswami, Rasipuram: Textile industry—power looms for weaving can be established as yarn and electric power is available in abundance in Salem district. This industry can start operation within three years with a capital of Rs. 5 lakhs or less.

(1) *Sri S. Panduranga Rao, and* (2) *V. V. L. Rao (Coimbatore), Madras*: Chemicals, heavy and electro-chemicals, electrical and allied industries, electro-metallurgical industries can be established at suitable places in this Province.

Sri V. K. Phalgunan, Cannanore: Rapid electrification of the Province by the starting of as many hydro-electric power houses will accelerate the industrialization of the Province. Manufacture of automobiles and textile industry can be established in this district. The Government should start a producer-gas plant in the heart of the forest area and supply to every household through pipes the gas for fuel purposes. Sugar industry and fishing should be started in the Mangalore area and the latter will require only less than Rs. 3 lakhs capital and can be started in three years.

Sri C. Rajam, Mylapore: Textiles, manufacture of all sections of steel materials, wires, wire nails, etc., consumer goods can be started and commence operation in less than three years and with a capital of less than Rs. 5 lakhs.

Sri B. S. Ramiah, Bangalore: Wool carpet and pile druggets manufacture, cotton, silk and handloom weaving can be introduced within three years in Bangalore, Vellore and Madras.

Sri T. A. Ramalingam Chettiar, Coimbatore: The following industries can be started immediately in the places noted against them with a capital of more than Rs . 5 lakhs.

(1) Fertilizers—Trichinopoly district.

(2) Vegetable oils—Vizagapatam, Ceded districts, South Arcot and Coimbatore.

(3) Sugar—East Godavari, Tanjore, Tinnevelly and Coimbatore.

(4) Textile—Expansion in Coimbatore district.

Sri S. V. Ranga Rao, Guntur: Manufacture of cigarettes, glass, fertilizers, bricks and paints can be taken up in three years in Guntur district with a capital of more than Rs. 5 lakhs.

Sri V. V. L. Rao, Madras: Manufacture of radios can be taken up in Madras in three years with a capital of one crore.

(1) *Sri S. N. N. Sankaralinga Iyer, Madras,* (2) *Sri P. K. A. Srinivasan, Rajapalayam and* (3) *Dr. A. V. Varadaraja Iyengar, Bangalore*: Iron and steel and magnesite in Salem, manganese in Ceded districts, lignite in South Arcot, heavy chemicals in Tinnevelly, expansion of weaving branch of the textiles, industrialization of agriculture, fertilizers in Trichinopoly and Tinnevelly, paints in Ceded districts will bring about the rapid industrialization of the Province. Heavy chemicals, paper, sugar can be started in Tinnevelly district in addition to mechanisation of agriculture. The industries can be started within three years with over Rs. 5 lakhs capital.

Mr. S. P. Sarma, Madras: The Government can take over the pharmaceutical industries and develop them by stages in three years by expanding the present King Institute, Guindy.

A. K. Sharfuddin, Trichinopoly: Fertilizers, heavy chemicals like sulphuric acid, cement, textiles, ceramics, vegetable ghee and other small-scale industries are possible in Trichinopoly district and can be started with a capital of more than Rs. 5 lakhs. Iron and steel, aluminium, cement, magnesite, vegetable ghee, textiles are possible in Salem district and can be started with a capital of more than Rs. 5 lakhs.

Sri C. V. Thyagarajan, Madras: Cement works, manufacture of machine tools and lathes, drilling machines, etc., can be taken up in Madras within three years with a capital of less than Rs. 5 lakhs.

Sri C. J. R. Varaprasada Rao, Bezwada: Chromium industry, cement, glass and ceramics industries have considerable scope for development in the Kistna district. The chief industry that can be started within three years with a capital of Rs. 5 lakhs is mining of the raw materials like limestone, chrome ore, quartz, felspar, etc. Dichromate factories can be started with a capital of Rs. 5 lakhs within three years.

Sir T. S. Venkataraman, Theagarayanagar: Sugar industry can be started in three years with the help of electricity by the introduction of electric grid in the Tanjore district with a capital of Rs. 30 lakhs.

Sri C. S. Vidyasanker, Mylapore: Iron and steel at Salem or Mettur, paper at Malabar, Mettur and Tinnevelly, cement and glass at North Arcot and Madras and electrical goods of all kinds—manufacture of all these can be started in three years.

Sri P. Yagneswardu, West Godavari: Wood distillation and consequent realization of by-products can be established in the West Godavari district. There are also facilities for the manufacture of pencils, fibre products, wool industry and cotton cultivation.

Sri R. Yamakuttia Pillai, Sikkil: There is considerable scope for the development of steel trunk industry in Negapatam, Tanjore district.

Mr. M. N. Abdul Majid, Sikkil: Fertilizers, dairy farming offer considerable scope for development in the Tanjore district and can commence operation in six months as trained labour is available.

Andhra Provincial Ryots' Association, Bezwada: The following is the list of industries that could be started in the districts mentioned against them in more than three years with a capital of less than Rs. 5 lakhs :—

Sugar—East and West Godavari, Vizagapatam and Kistna.
Fruit canning—East and West Godavari, Kistna and Cuddapah.
Tobacco and cigar—Guntur and Kistna.
Vanaspathi—Anantapur, Kurnool, Guntur and Kistna.
Textiles—Bellary, Kurnool, Anantapur and Guntur.
Porcelain and glass—Godavari, Vizagapatam and Guntur.
Cement—Guntur, Kistna and the Ceded districts.
Fertilizers—Vizagapatam and Bezwada (Kistna).
Iron—Bellary, Kurnool and Cuddapah.
Manganese—Bellary, Vizagapatam and Godavari.
Chromite—Kistna district.
Gold—Anantapur.
Copper—Nellore.
Lubricants—Godavari and Nellore.
Pencil—Godavari and Kistna.
Paper—Vizagapatam and Godavari.
Asbestos—Ceded districts.
Dry batteries—Vizagapatam and Godavari districts.

The Dindigul Exporters' Association, Dindigul: Installation of expellers and oil refinery, cotton, yarn and surgical cotton mills, soap factories and match factories can be established in Madura district.

The East Godavari District Fishing Communities Union, Cocanada: Fish-curing, canning, manufacture of fish-oil, fish-meal and Guano and Refrigeration can be started in the East Godavari district with Cocanada as Headquarters in less than three years with Rs. 5 lakhs as capital.

The Salt Manufacturers' and Merchants' Association, Tuticorin: The Government should take up the expansion and improvement of the production of salt in this Province and Textiles and tropical plantations of palmyrah trees in the Tinnevelly district.

The South India Mill-Owners' Association, Madras: Further expansion of textile mills, sugar mills in the South Arcot, Trichinopoly, Tanjore and Tinnevelly districts, iron and steel in Salem district, biscuits and confectionery, manufacture of agricultural implements and machinery and wood products industry can be started within three years.

Amalgamations, Ltd., Madras: Paints and chemicals, saw mills and joinery radio manufacture, machine tools, general engineering, glass, body building, etc. can be established in this Province for rapid industrialization and there are ample

facilities in the Madras district for the manufacture of the first three industries within three years with over Rs. 5 lakhs as capital.

Balantram Industries, Ltd., Rajahmundry.—Heavy chemicals in Cocanada, Tuticorin and Masulipatam, coal mining in East Godavari district, dairy farming in Vizagapatam and Godavari districts can be established in three years with over Rs. 5 lakhs as capital. The other industries that can be established in Andhra Desa are fertilizers, iron and steel, lead, zinc and copper mining sugar and its by-products, newsprint and paper manufacture, marble mining, graphite crucibles, ceramics, glass, mica and micanite products, textiles, cement and oil refining, etc.

Chari and Chari Ltd., Madras : Cigarette making industry can be started in less than three years with a capital of Rs. 30 lakhs in Madras.

The Craftsman, Ltd., Madras : The East Indian Tanning Industry offers scope for considerable development in this Province and the export of sheep and goat skin should be completely stopped. Glue should be manufactured as a by-product in tanneries and necessary machinery should be imported in this connection.

The Hindupur Vegetable Oils and Refineries, Ltd., Hindupur : Textiles, sugar, vegetable oil, tanning of leather and leather goods manufacture can be started and operated within three years with more than Rs. 5 lakhs as capital. Mining of gold, mica, asbestos, corrundum, etc., may also be taken up in this district.

The India Mines and Industries, Ltd., Bezwada : Manufacture of leather goods including footwear on mass scale can be started and can function within three years.

G. Janshi & Co., Madras : The assembling of radio parts which should be imported for the present from abroad can be taken up in this Province and later the manufacture of Radio itself.

Kamala Sugar Mills, Ltd., Udamalpet : Sugar and Fertilizers Factory can be started in the Coimbatore district.

Sri Kannabiran Mills, Ltd., Coimbatore : Sugar, biscuit manufacture, cement and soap industries can be started in three years in this district.

Modi & Modi, Madras : Manufacture of agricultural tools and implements should be started in Coimbatore with Rs. 5 lakhs as capital.

T. K. Nair & Sons, Ottapalam, Malabar : Manufacture of watches, clocks, gramphones, mechanical toys and automobile engineering can be undertaken in Malabar district.

P. Natesan & Co., Ltd., Madras : Manufactures of agricultural pumps, electrical motors, up to 50 H.P. electrical accessories, electrical porcelain up to 22 K.V., meters, Transformers up to 250 K.V.A. and switch fuse and control gear can be started in this Province within three years with less than Rs. 5 lakhs as capital.

The Rajeswari Mills, Ltd., Gudiyattam : Textiles and allied industries like hosiery, cement, paper may be started in the North Arcot district within three years with Rs. 10 lakhs as capital.

Seshasayee Bros., Ltd., Trichinopoly : Manufacture of sulphuric acid, cement and superphosphate can be undertaken in Trichinopoly district and that of calcium carbide, alumina and aluminium compounds, magnesium and magnesium compounds in the Salem district within three years with more than Rs. 5 lakhs as capital.

The South Indian Products and Industries, Ltd., Tinnevelly : Sugar industry can be easily started in the Tinnevelly district within three years with Rs. 5 lakhs as capital.

Sree Mahalakshmi & Co., Madras : Manufacture of distempers in different genuine colours, dyestuffs and chemicals, manufacture of lorries and motor accessories can be taken up in this Province within three years with a capital of less than Rs. 5 lakhs.

The Standard Crucible Works, Rajahmundry : The crucible industry and the manufacture of other products can be started within three years with less than Rs. 5 lakhs as capital.

Tuticorin Spinning Mills, Ltd : Industries for the manufacture of Senna and fibre products can be successfully started in the Tinnevelly district in a profitable manner.

The United Glass Works, Ltd., Madras : Sheet glass manufacture, paper, textiles and other industries can be started in this Province within three years with less than Rs. 5 lakhs.

The Andhra Pharmaceutical Works, Ltd., Bezwada : Fine chemicals, drugs, cement, fertilizers and soap industry can be started in the Andhra districts with more than Rs. 5 lakhs as capital.

Q. 3.—If you are already interested in the management of any existing industry, please say whether you experience any difficulties in the successful working thereof or in expanding it and how, in your opinion, the Government could help you to overcome them.

S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district : I am running four tanneries in North Arcot district and the difficulties met are (i) want of proper machineries, and (ii) wattle bark. The Government should start a factory at Ranipet to manufacture finished leather and soles. The progress of the construction of my oil mill has been considerably handicapped for want of iron, steel and cement materials and I request the Government to arrange for the speedy supply of the same.

Sri S. Chakrapani, B.A., B.L., Cuddalore O.T. : I am now managing an oil mill which is expanding into a vegetable oil refining plant. No difficulty has been experienced in running this factory.

Messrs C. V. Cheru & Sons, Pattambi, South Malabar : A limited company—Pattambi Saw Mills, Ltd., has been registered under our auspices and are on the look out for up-to-date foreign machinery and we request the Government to help us in securing the necessary machinery and timber for our saw mills.

Mr. P. B. Kurup, Calicut : I am the Managing Director of Techno-Chemical Industries, Ltd., and am experiencing difficulties in getting adequate quantities of caustic soda, vegetable tallow, etc.

Sri C. Rajam, Mylapore : The Indian Steel Rolling Mills, Negapatam, is under my management and it has to be closed frequently for lack of supply of billets. The Government instead of importing finished steel articles, can obtain steel billets which could be rolled in this mill according to requirements. The Government can import billets by sea.

Sri T. A. Ramalingam Chettiar, Coimbatore : I am interested in Textiles and the Government's restriction as regards the production of finer counts of yarn stands in the way of development. Some sort of settlement is necessary between labour and management.

Sri V. V. L. Rao, Madras : The present difficulties are vested interests of the Directors, Managing Agency system and cancellation of import licences.

Sri H. R. Seshadri, Chittoor : The Sandalwood Oil Distilleries in Chittoor district are experiencing difficulties on account of the high price of the wood in this district in comparison to that in the Mysore State.

Mr. A. K. Sharfuddin, Trichinopoly : I am the Managing Director of the Magnesite Corporation of India, Ltd., and my application for steel and galvanized sheets to put up sheds is still under the consideration of the Government.

Sri C. J. R. Varaprasada Rao, Bezwada : I am now interested in the management of a mining concern. Considerable difficulty is being experienced in getting prospecting licence and mining leases from the Government.

Sri P. Yagneswaradu, West Godavari : I am now interested in a wood distillery at Nuzvid and I am not able to get wood at cheap rates. The Government may make available sufficient wood for the wood distillation.

The South India Mill-owners' Association, Madras : We are interested in Oil Milling Vanaspathi Industry and are experiencing difficulty in getting iron and steel, zinc sheet and pipes, cement, machinery parts and electric power to carry out further expansion of the factories.

Amalgamation, Ltd., Madras : We are interested in public transport, motor Engineering, General Engineering, Body Building and Printing. The Government could expand these industries by recognizing only bona fide labour unions representing distinct industries and giving more assistance to such labour unions.

Balantram Industries, Ltd., Rajahmundry : I am interested in the management of . fountain pen manufacturing industry and the main difficulty is finance. The Government may be pleased to purchase 51 per cent of the shares so that public may come forward to subscribe money.

Chari and Chari, Ltd., Madras : We are managing a firm for the export of tobacco to foreign countries. The Government by way of establishing one or two tobacco redrying factories can overcome our main difficulty.

The Craftsman, Ltd., Madras : We are in the leather goods manufacturing and our difficulty is supplies of chemicals, dyestuffs, etc.

Factors, Ltd., Madras : We are interested in setting up a factory for the manufacture of zip fasteners. Acquisition of lands for the factory, municipal sanction, power, etc., will considerably help the growth of this industry.

The Hindupur Vegetable Oils and Refineries, Ltd., Hindupur : We are interested in Vegetable Oils and Refineries. The difficulties are supply of iron and steel, cement and other building materials.

The India Mines and Industries, Ltd., Bezwada : I am interested in a mining concern and the difficulties are innumerable. The blasting of hard rocks is not permitted, no transport facilities, no additional ration for the workers of the mines, etc.

Kamala Sugar Mills, Udamalpet : I am interested in Textile industry and the labourers of the textile mills may be recommended to be paid on the basis of the work turned out by each of them.

Sri Kannabiran Mills, Ltd., Coimbatore: I am interested in the management of the Textile industry. I need roofing materials and also 10,000 more spindles for the expansion of the factory.

The Kasturi Industries, Ltd., Coimbatore : We are interested in starting a new factory for the manufacture of textile machinery parts to begin with. Supply of raw materials, power and building materials will help the industry.

T. K. Nair & Sons, Ottapalam, Malabar : We are interested in a firm manufacturing spare parts, non-ferrous alloys, railway carriage fittings, collapsible gates, etc. The Government should secure the raw materials at control rates.

Seshasayee Bros., Ltd., Trichinopoly : We are the Managing Agents for the Mettur Chemical and Industrial Corporation, Ltd., and the Fertilizers and Chemicals, Travancore, Ltd. We require the assistance and co-operation of the Government in keeping these factories at peak production.

The Standard Crucible Works, Rajahmundry : I am interested in the crucible factory at Rajahmundry and it can be developed if machinery and capital are available. Government can give state aid.

The Sudarsan Oil Mills, Ltd., Madras : We are concerned with Vanaspathi Industry and our main difficulty has been in procuring necessary construction materials—steel pipes, etc.

The Estates India, Ltd., Coimbatore : We are concerned with the growing of tea, coffee, cinchona and cardamoms and this is outside our Province. Government could help the tea and cardamom growing industries by making funds available for research.

Tirumurti Mills, Ltd. : We are interested in a Textile Mill and the Government may recommend the labourers to be paid on the basis of the work turned out by each of them.

Tuticorin Spinning Mills, Ltd. : Interested in the management of textile industry—Delivery of machinery is expected only after 1949. Iron and Steel and other building materials are required.

The Andhra Pharmaceuticals, Ltd., Bezwada : The main difficulties in managing the industry with which I am connected with are in the procurement of the raw materials, transport facilities and better marketing methods.

Q. 4.—If you have obtained permission to start a new industry, please say when you expect it to begin functioning and, if you are experiencing delay, the reasons therefor.

Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district : Licence for starting an oil expeller factory has been obtained but the working of it is delayed for want of iron, steel and cement.

Sri S. Chakrapani, B.A., B.L., *Cuddalore O.T.* : Permission has been applied for starting a Chemicals and Fertilizers factory as well as paper and boards industry in this district. I have not obtained the permission and this may be given to enable me to start these industries.

Sri Y. Mahabaleswarappa, Bellary : Permission has been obtained for the starting of a Textile Mill but it may take three years to begin functioning.

Sri V. V. L. Rao, Madras : A factory for assembling Radio receivers is to be started in a year but delayed due to difficulties in importing and want of experts.

Sri S. N. N. Sankaralinga Ayyar, Madras : A new cement factory is to be started and is expected to go into production by June 1948. The difficulties in getting

building materials and transport are considerable. Government may sanction the requisite electric power to facilitate the erection of machinery and also help by leasing out more areas of limsetone deposits.

Mr. A. S. Sharfudin, Trichinopoly: Permission has been obtained for the manufacture of carbon dioxide gas from dry Ice from out of magnesite. The plant is ready for shipment in America and the production is expected in March 1948. The Government should help in the matter of power supply and water from Cauvery.

Sir T. S. Venkataraman, Thyagarayanagar: Permission has been granted for promoting a sugar factory in Tanjore. Government's assistance in securing the machinery and in the harnessing of irrigation facilities to the sugarcane grower will accelerate this industry.

Madras Mica Association, Gudur: Permission has been obtained for starting the manufacture of mica and micanite products. Actual manufacture can be started in the last quarter of 1948. Electrical power supply, transport facilities, technical help will enable to start the manufacture earlier.

Amalgamations, Limited, Madras: The Government should assist in securing permits to import the special machinery that may be required for the industries in which we are interested.

Balantram Industries, Limited, Rajahmundry: Licence has been issued to open coal mine in the East Godavari district but the Madras Government have imposed a ban which delays the growth of the industry. I request the Government to remove such bans.

Chari and Chari, Limited, Madras: Permission has been obtained to start a cigarette making factory. We are experiencing difficulty in raising the required capital in South India.

Factors Limited Madras: We have obtained permission for a soda ash plant and we are not able to start the industry and request the Government to participate in the Capital.

The Hindustan Vegetable Oils and Refineries, Limited, Hindupur: We have obtained permission to start vegetable oil and refineries. We hope to start in January 1948 if iron and steel materials are given immediately.

Kamala Sugars, Limited, Udamalpet: Obtained permission for starting sugar and allied products. Delay is due to import restrictions and uncertainty of delivery.

Sri Kannabiran Mills, Limited, Coimbatore: I have obtained permission to start textile industry and I expect it to begin functioning in 1949. The delay is due to the non-supply of machinery from United Kingdom.

The Rajeswari Mills, Limited, Gudiyattam: We are permitted to start a Textile Mill and the Government should help us in securing cement, iron and steel and such other constructional materials.

Seshasayee Brothers, Limited, Trichinopoly: We have obtained permission to start a 20 ton per day oil refining and hydrogenation plant at Trichinopoly and it is expected to begin functioning early next year. Our difficulty is in the way of procuring iron and steel, building materials.

The South Indian Products and Industries, Limited, Tinnevelly: Permission has been obtained to start a sugar factory and it is expected to function from December 1947. Delay is due to want of capital and public support.

Tirumurthi Mills, Limited: Permission has been obtained for starting of sugar and allied industries. Delay is due to import restrictions and uncertainty of delivery of machinery.

Q. 5.—What are the mineral resources available in your district? Are they being exploited? If not give reasons for the failure to exploit them.

Mr. S. M. Abdul Jameel, Melvisharam, North Arcot district: It is believed that iron, gold and other minerals are available but no thorough geological survey of this district has yet been made.

Sri S. Chakrapani, B.A., B.L., *Cuddalore O.T.*: Except lignite which is being investigated by the Government there are no other minerals worth mentioning in the South Arcot district.

Sub-Committee of the Industrial Planning and Development Committee: Mineral resources are available for Glass Idustries in Gurzala and Narasaropet taluks. Corrundum seems to be available in Kolankonda and Vengalapalayam hills.

(1) *Mr. P. B. Kurup and* (2) *Mr. P. V. D. Menon, Calicut :* There has been no proper geological survey of Malabar district. This district is reported to contain china clay, soapstone, gold, iron ores, lignite, felspar and quartz.

Sri Y. Mahabaleswarappa, Bellary : Red oxide, soapstone, manganese and yellow ochre and emery stones are available but no survey has yet been made.

Sri P. N. Menon, Malabar Gold, mica and thorium are reported to occur but no complete geological survey has yet been made in the Malabar district.

Sri R. Natarajan, Mylapore Silica is available in the North Arcot district. But no systematic survey has yet been made.

Sri P. A. Palaniswami, Rasipuram : Iron ore is available in the Salem district but there is no coal available for extracting the ore.

Sri V. L. Phalgunan, Mangalore : China clay and kaolin are available but the resources are not fully developed.

Sri C. Rajam, Mylapore : With iron ores at Salem, coal deposits at Cuddalore and the hydro-electric power at Mettur, the Madras Government can start a steel-making plant.

Sri S. V. Ranga Rao, Guntur : No systematic survey has yet been made.

Sri S. N. N. Sankaralinga Ayyar, Madras : Limestone is the chief mineral resource of the Tinnevelly district.

Sri H. A. Seshadri, Kuppam, Chittoor : Gold is reported to occur here and a Bombay man is exploiting it.

Sri P. Yagneswaradu, West Godavari : There are graphite mines in the West Godavari district but not exploited.

Mr. F. Albuquerque, Mangalore : No survey of mineral resources has been made of the country below Western ghats and it is highly expedient to conduct a survey of the South Kanara district and Malabar district.

Madras Mica Association, Gudur : A tile factory may be started in Nellore district in a suitable place. The right type of clay is available in this district.

The Hindupur Vegetable Oils and Refineries, Limited, Hindupur : Gold, iron-ore, mica, asbestos, soapstone and corrundum are reported to occur. They have not been exploited.

The Rajeswari Mills, Limited, Gudiyattam : Plenty of red mud is available in Thachur village of Arni Jaghir of the North Arcot district which can well be utilized for the manufacture of tiles.

The Standard Crucible Works, Rajahmundry : Graphite, carborundum, emery, silica fire clay and other earths are reported to occur. They are not well exploited.

The Andhra Pharmaceuticals, Limited, Bezwada : Chromite ore, salts, bitterns and graphite are reported to occur in the Andhra districts.

Q. 6.—What industries in your opinion should be completely nationalized ? What criteria would you suggest for nationalization of industries ? What industries do you think should receive State aid and what should be left wholly to private enterprise ? Do you favour any sort of Government control over all industries irrespective of the fact whether they are State-aided or not ?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district and* (2) *Messrs. P. B. Kurup and P. V. D. Menon, Calicut :* In this district no industry offers itself for complete nationalization. State-aid and Government control are desirable.

Sri S. Chakrapani, B.A., B.L., Cuddalore O.T. : None other than communications industry can be nationalized ; official red tape and business efficiency will go together and if there is any Government control over industries even while they are sought to be established industrialization on the grand scale that is visualized will surely become an idle dream.

(1) *Sub-Committee of the Industrial Planning and Development Committee and* (2) *Messrs. C. V. Cheru and Sons, South Malabar :* Textiles, transport buses, paper, coal, rubber, coffee and tea, film manufacture, automobiles and cycle manufacture can be nationalized. Nationalization should be assumed only where raw materials are available but capital is not forthcoming and where failure of industry is due to lack of technical help and organization.

Mr. P. B. Doraiswami, Industrial Engineer, Chittoor : Mining should be nationalized.

(1) *Mr. H. Joga Rao, B.Sc., Radio Engineer, Madras and* (2) *Sri T. A. Ramalingam Chettiyar, Coimbatore* : All industries of public utility should be nationalized industries, the products of which are required at least by 60 per cent of the population may be nationalized.

(1) *Mr. K. A. Joseph, M.A., Presidency College, Madras,* (2) *C. J. R. Varaprasada Rao, Bezwada and* (3) *Amalgamations, Limited, Madras* : Basic industries, armament factories or public utilities should be nationalized while the manufacture of consumer goods should be left to private enterprise.

Sri Y. Mahabaleswarappa, Bellary : Industries requiring Rs. 75 to Rs. 100 lakhs should be nationalized, those requiring over Rs. 25 lakhs should receive State aid and no control should be exercised over industries by the Government.

Sri P. N. Menon, Malabar : Mineral resources, timber products, by-products of coconut industry, paper, strawboard and rubber industries should be nationalized. All industries whether large scale or small scale should be protected by Government.

(1) *Sri R. Natarajan, Mylapore,* (2) *Sri S. Panduranga Rao, Coimbatore* and (3) *Sri C. Rajam, Mylapore* : Transport, textiles, chemicals and iron and steel industries can be nationalized. The Government interference in any industry should be limited to basic industries and those that immediately or intimately affect the welfare of the community at large.

Sri P. A. Palaniswami, Rasipuram : All basic industries should be nationalized.

(1) *Sri S. V. Ranga Rao, Guntur,* (2) *Sri. V. V. L. Rao, Madras,* (3) *Mr. A. K. Shafruddin, Trichinopoly,* (4) *Sri. C. V. Thyagarajan, Madras,* (5) *Dr. A. V. Varadaraja Ayyangar, Bangalore and* (6) *The Salt Manufacturers' and Merchants' Association, Tuticorin* : All basic industries and industries requiring capital running to crores should be nationalized. There is no question of State-aid. But some sort of Government control in all public enterprises is necessary in the interest of subscribers.

(1) *Sri V. V. L. Rao, Madras,* (2) *Sri P. Yagneswaradu, West Godavari and* (3) *Seshasayee Brothers, Limited, Trichinopoly* : Industries which cannot stand foreign competition in the initial stages only need be State-aided.

Sri S. N. N. Sankaralinga Ayyar, Madras : All basic industries should be controlled by the State having 51 per cent of the shares. Management should always be in the hands of private companies.

Mr. F. Albuquerque, Mangalore : Cement may be nationalized. Sugar may be worked and developed by private enterprise with State aid. Consumer goods industries may entirely be left to private enterprise. Deep-sea fishing should be tackled entirely by Government.

Andhra Provincial Ryots' Association, Bezwada : All key and basic industries are to be nationalized. Those industries that cannot be run by private capital should also be run by Government. Government should have control over consumer goods industries.

The East Godavari District Fishing Communities Union, Cocanada : Fishing industry should receive State-aid to the fullest extent possible and should not be left entirely to private enterprise.

The South India Mill Owners' Association, Madras : All key industries and public utility industries can be nationalized. The rest should be left to private enterprise. In nationalization the State should observe high principle of socialism. State aid to industries can be given only to small scale and cottage industries.

Chari and Chari, Limited, Madras : Power generation and transport may be completely nationalized. Other industries should be left to private enterprise. State control in any form will not prove conducive to the country's industrial development.

Chitra and Company, Madras : The Government should make a start in nationalization with electrical supply undertakings and then with mineral companies, then with insurance companies, and so on. However, nationalization should not start at a time when commercial undertakings have a temporarily inflated earning power.

The Craftsman, Limited, Madras : Heavy industries like iron and steel, cement, heavy chemicals and fertilizers may be nationalized. Government should control to the extent of preventing amalgamations with a view to dictate prices.

Factors, Limited, Madras : Industries which depend directly on the exploitation of natural resources of the land should be nationalized. Basic industries should receive State-aid only, i.e., the State should take 51 per cent of the shares.

The Hindupur Vegetable Oils and Refineries, Limited, Hindupur: Iron and steel, manufacture of machinery, cement and electrical goods may be nationalized. For all other industries State-aid is necessary by investing 50 per cent of the share capital. No control is necessary over industries which do not receive any State-aid.

Hindustan Co-operative Insurance Society, Limited, Madras: The fertilizer, soap, paper and vanaspathi industries must be under Government control with at least 51 per cent Government capital.

Q. 7.—Besides giving financial aid, in what other ways can the State accelerate the growth of industries? Can you mention specific industries which stand in need of such help and the nature of the help required?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district*, (2) *Sri H. Joga Rao, Radio Engineer, Madras*, (3) *Sri R. Natarajan, Mylapore*, (4) *Sri P. A. Palaniswami, Rasipuram*, (5) *Sri S. Panduranga Rao, Coimbatore*, (6) *Sri S. N. N. Sankaralinga Ayyar, Madras and* (7) *Sri C. J. R. Varaprasada Rao, Bezwada*: Transport facilities and supply of raw materials at concessional rates and supply of motive power at cheap rate are the ways by which the Government can accelerate the growth of industries.

Sri S. Chakrapani, B.A., B.L., Cuddalore O.T.: Financial aid to industries may be limited to short time accommodation and the State can offer help to industry by way of providing cheap power, housing schemes, etc.

Sub-Committee of the Industrial Planning and Development Committee: In addition to financial aid some technical help also either from Government or from foreign side has to be provided by the Government.

Sri P. B. Doraiswami, Industrial Engineer, Chittoor: The Government should help the industries in arranging for the sale of the products by means of prohibiting import of such goods as are manufactured in this Province.

(1) *Mr. K. A. Joseph, M.A., Presidency College, Madras*, (2) *Mr. A. K. Sharfudin, Trichinopoly and* (3) *Sri C. S. Vidyasankar, Mylapore*: Government should have an Industrial Planning Commission to formulate the plan and give correct informations.

(1) *Sri P. N. Menon, Malabar*, (2) *Sri S. V. Ranga Rao, Guntur*, (3) *Dr. A. V. Varadaraja Ayyangar, Bangalore and* (4) *Mr. F. Albuquerque, Mangalore*: Import facilities, technical help, better marketing methods are the ways by which the Government can help the industries.

Sri C. Rajam, Mylapore: The Government should check up at every stage the growth of the industries and if there is any fault in the management or working of the industry, Government should take it up themselves or give it to some other competent body.

Sri T. A. Ramalingam Chettiyar, Coimbatore: A geological survey in particular localities where raw materials are available will be of assistance in starting mineral industries.

Sri V. V. L. Rao, Madras: The Government may appoint purchasing agents in foreign countries for the plants and machinery required here.

Sri H. A. Seshadri, Kuppam, Madras: The Government should ban the export of sandalwood outside India and arrange for the requisite supply of the sandalwood to the factories at minimum rate.

Sri P. Yagneswaradu, West Godavari: The Government should introduce legislation to make rich people to invest their surplus funds in industries. The State should protect the industries from foreign competition.

Sri R. Yamakuttia Pillai, Sikkil: Arrangements may be made by the Government to supply necessary raw material for the steel trunk industry.

Andhra Provincial Ryots' Association, Bezwada: Government should train individuals in every branch of industry in which they are interested and thus keep a set of trained people in each district.

The South India Mill Owners' Association, Madras: Experts from overseas may be employed to advise industrialists on all matters.

Amalgamations, Limited, Madras: The Government should assist industry in procuring machinery and raw materials from abroad and the utilization of goods to be manufactured in India.

The Craftsman, Limited, Madras: State could help by grant and acquisition of lands for industrial establishments, supply of building materials and power facilities.

The Hindupur Vegetable Oils and Refineries, Limited, Hindupur : Free technical advice should be given to each industry.

Kamala Sugars, Limited, Udamalpet : The Government may help in procuring the building materials, import of necessary machinery and assistance for getting raw materials.

Sri Kannabiran Mills, Limited, Coimbatore : Technical help is essential for sugar industry in Coimbatore.

T. K. Nair and Sons, Ottapalam, Malabar : The Government should restrict unfair dumping of foreign goods, both key materials and consumer goods. Any financial aid from the State should preferably be in the shape of loans at low rates of interest rather than shares and controlling interest.

The Rajeswari Mills, Limited, Gudiyattam : The Government can provide the industrialists with necessary priority certificates in getting their requirements.

The South Indian Products and Industries, Limited, Tinnevelly : The State can give facilities for giving technical advice and help in procuring machinery and trained personnel or provide facilities for employees to be trained abroad.

The Standard Crucible Works, Rajahmundry : The State should help in marketing the products in foreign countries.

The Tirumurthi Mills, Limited : The Government may help in procuring the building materials, import of necessary machinery and assistance in getting raw materials, if necessary.

Q. 8.—Are you satisfied with the working of the State Aid to Industries Act ? Do you suggest any amendments to it ; or would you prefer the financing of industries to be left to a Finance Corporation ? What powers and functions would you suggest for such a Finance Corporation ?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district,* (2) *Mr. K. A. Joseph, M.A., Presidency College, Madras,* (3) *Messrs. P. B. Kurup and P. V. D. Menon, Calicut and* (4) *Mr. A. K. Sharfudin, Trichinopoly :* I am not satisfied with the working of the State Aid to Industries Act and the financing of industries should be entrusted to a Finance Corporation of the American model which should have unlimited powers for the grant of financial aids and for the supervision and control over industries financed.

(1) *Sri S. Chakrapani, B.A., B.L., Cuddalore O.T.,* (2) *Sri Y. Mahabaleswarappa, Bellary,* (3) *Sri T. A. Ramalingam Chettiyar, Coimbatore,* (4) *Mr. F. Albuquerque, Mangalore and* (5) *The South India Mill Owners' Association, Madras :* State Aid to Industries Act has not been availed of successfully to establish any industrial institutions. The establishment of a Finance Corporation providing prompt and extended credit and cash aid to deserving industries in times of need is welcome.

(1) *Sub-Committee of the Industrial Planning and Development Committee,* (2) *Messrs. C. V. Cheru and Sons, South Malabar,* (3) *Sri H. Joga Rao, Radio Engineer, Madras,* (4) *Sri S. V. Ranga Rao, Guntur,* (5) *The Craftsman, Limited, Madras,* (6) *Factors, Limited, Madras,* (7) *Seshasayee Brothers, Limited, Trichinopoly and* (9) *The United Glass Works, Limited, Madras :* I am satisfied with the working of the State Aid to Industries Act in so far as it has benefited to a small extent small scale industries. The financing of industries should be left to a financing corporation.

Mr. P. B. Doraiswami, Industrial Engineer, Madras : Somehow or other finance should be procured for deserving schemes without any difficulty.

Sri P. N. Menon, Malabar : I am not satisfied with the working of the Act but suggest an Impartial Advisory Board of Enquiry for considering the question of aiding industries. This may be necessary even for the Finance Corporation.

(1) *Sri C. Rajam, Mylapore and* (2) *Sri P. Yagneswaradu, West Godavari :* The present system of State-aid to industries is most unsatisfactory and necessary amendments may be made to effect the aid to be given immediately when needed. The Finance Corporation may be a separate body.

Sri V. V. L. Rao, Madras : I am not satisfied with the State Aid to Industries Act and it should be amended. I do not prefer financing of industries by Finance Corporation.

Sri S. N. N. Sankaralinga Ayyar, Madras : The initial investment in shares may be done by the Government direct. Long-term financial aid may be undertaken by the Finance Corporation.

Andhra Provincial Ryots' Association, Bezwada: The State should take up the Organization of Industrial Co-operatives and the Finance Corporation has to extend full help.

The East Godavari District Fishing Communities Union Cocanada: I am satisfied with the work of the State Aid to Industries Act and suggest that there should not be any delay in giving State Aid. The question of Finance Corporation does not arise.

(1) *Amalgamations, Limited, Madras*, (2) *Balanatram Industries, Limited, Rajahmundry*, (3) *The Hindustan Vegetable Oils and Refineries, Limited, Hindupur*, (4) *Sri Kannabiran Mills, Limited, Coimbatore*, (5) *The Kasturi Industries, Limited, Coimbatore*, (6) *T. K. Nair and Sons, Ottapalam, Malabar*, (7) *The Rajeswari Mills, Limited, Gudiyattam*, (8) *The Sudarsan Oil Mills, Limited, Madras*, (9) *The Tuticorin Spinning Mills, Limited and* (10) *The Andhra Pharmaceuticals, Limited, Bezwada*: The Financing of industries should be left to a Finance Corporation where any private financial assistance is sought for the establishment of industry.

Chari and Chari, Limited, Madras: The State should come forward with the guarantee of payment of interest on dividends to the shareholders at 4 per cent per annum for the first five years after the commencement of the industry. I am not satisfied with the State Aid to Industries Act nor I am in favour of a Finance Corporation. Private enterprise should be left to fight its own way and the only help that the Government can give to develop indigenous industries is by a policy of protection by way of tariffs.

Q. 9.—Would you advise some system of licensing the starting of industries to ensure proper regional distribution and also to prevent the establishment of bogus enterprises ?

Sri S. Chakrapani, B.A., B.L., Cuddalore O.T.: The Government can exercise a check in the interests of the investing public over institutions which appear to ignore regionalization of industries, and may be Prima facie declared bogus.

Sub-Committee of the Industrial Planning and Development Committee: For a period of five years it would not be advisable to resort to adopting of licensing the starting of industries as it would be detrimental to the rapid growth of industries in any particular region.

(1) *Messrs. C. V. Cheru and Sons, South Malabar and* (2) *The Standard Crucible Works, Rajahmundry*: Licensing system is good in theory but injurious in practice, retards industrialisation if not administered impartially.

(1) *Mr. P.B. Doraiswami, Industrial Engineer, Chittoor*, (2) *Sri H. Joga Rao, Radio Engineer, Madras*, (3) *Mr. K. A. Joseph, M.A., Presidency College, Madras*, (4) *Messrs. P. B. Kurup and P. V. D. Menon, Calicut*, (5) *Sri Y. Mahabaleswarappa, Bellary*, (6) *Sri P. N. Menon, Malabar*, (7) *Sri P. A. Palaniswami, Rasipuram*, (8) *Sri C. Rajam, Mylapore*, (9) *Sri S.V. Ranga Rao, Guntur*, (10) *Sir V.V.L. Rao, Madras*, (11) *Sri S. N. N. Sankaralinga Ayyar, Madras*, (12) *Mr. A. K. Sharfudin, Trichinopoly*, (13) *Dr. A. V. Varadaraja Ayyangar, Bangalore*, (14) *Sri T. S. Venkataraman, T. Nagar*, (15) *Mr. F. Albuquerque, Mangalore*, (16) *Andhra Provincial Ryots' Association, Bezwada*, (17) *South Indian Mill Owners' Association, Madras*, (18) *Amalgamation, Limited, Madras*, (19) *Factors Limited, Madras*, (20) *The Hindupur Vegetable Oils and Refineries, Limited, Hindupur*, (21) *Kamala Sugars, Limited, Udamalpet*, (22) *Sri Kannabiran Mills, Limited, Coimbatore*, (23) *T. K. Nair and Sons, Ottapalam, Malabar district*, (24) *The Rajeswari Mills, Limited, Gudiyattam*, (25) *The South Indian Products and Industries, Limited, Tinnevelly*, (26) *Sree Mahalakshmi & Co., Madras*, (27) *The Tirumurti Mills, Limited and* (28) *The Tuticorin Spinning Mills, Limited*: The Government should have some system of licensing. Only such persons who have wide industrial experience should be allowed to start industries.

(1) *Sri R. Natarajan, Mylapore and* (2) *Sri P. Yagneswaradu, West Godavari*: The issue of permits has come to acquire an unpleasant odour about it. The better thing is to leave the whole thing to the good sense of the individual who can start industries after due regard to the availability of raw material, labour and transport facilities. Certain conditions may be prescribed with which he may be compelled to conform in accordance with some industrial Act that could be legislated.

Sri C. J. A. Varaprasad Rao, Bezwada: The policy of the Government in granting licences to industries should be that they are equally distributed in the different parts of the Province according to the availability of raw materials, transport facilities, technical personnel, labour, etc.

The East Godavari District Fishing Communities Union, Cocanada: The Provincial Government on the advice of the Director of Industries and Commerce shall issue licences for starting industries to ensure proper regionalization.

Balantram Industries, Limited, Rajahmundry: Licensing the starting of industries will be in no way preventing establishment of bogus enterprises. Strict state control may be adopted.

Chitra & Co., Madras: There should be enacted a Provincial Statute for the licensing of industries which would follow the principle of regionalization of industries.

The Craftsman, Limited, Madras: Licensing freely small enterprises of within 5 lakhs to 10 lakhs capital in preference to large enterprises would be desirable.

Modi and Modi, Madras: There is no need for licensing small scale industries, but a definite number of industries in each district should be decided.

Seshasayee Brothers, Limited, Trichinopoly: We consider that the system of licensing the starting of industries is necessary so as to ensure proper regional distribution of industries and suggest that this power of licensing should be given to a Board of full-time officers of reputation and experience.

Question 10.—Do you favour the constitution of permanent Regional Industries Boards to be controlled by a Central Board to the Government in planning, regulation and establishment of industries? Would you have such Boards composed entirely of non-officials or officials or partly of both?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district*, (2) *Sri S. Chakrapani, B.A., B.L., Cuddalore O.T.*, (3) *Sub-Committee of the Industrial Planning and Development Committee*, (4) *Messrs. C. V. Cheru and Sons, South Malabar*, (5) *Sri H. Joga Rao, Radio Engineer, Madras*, (6) *Mr. K. A. Joseph, M.A., Presidency College, Madras*, (7) *Messrs. P. B. Kurup and P. V. D. Menon, Calicut*, (8) *Sri P. N. Menon, Malabar*, (9) *Sri R. Natarajan, Mylapore*, (10) *Sri P. A. Palaniswami, Rasipuram*, (11) *Sri S. Panduranga Rao, Coimbatore*, (12) *Sri C. Rajam, Mylapore*, (13) *Sri B. S. Ramiah, Bangalore*, (14) *Sri S. V. Ranga Rao, Guntur*, (15) *Sri V. V. L. Rao, Madras*, (16) *Sri S. N. N. Sankaralinga Ayyar, Madras*, (17) *Mr. A. K. Sharfudin, Trichinopoly*, (18) *Sri C. V. Thiyagarajan, Madras*, (19) *Sri C. J. R. Varaprasada Rao, Bezwada* (20) *Sir T. S. Venkataraman, T. Nagar*, (21) *Sri P. Yegneswaradu, West Godavari*, (22) *Sri R. Yamakkuthia Pillai, Sikkil*, (23) *Mr. M. N. Abdul Majid, Sikkil*, (24) *Andhra Provincial Ryots' Association, Bezwada*, (25) *The East Godavari District Fishing Communities Union, Cocanada*, (26) *The Salt Manufacturers and Merchants Association, Tuticorin*, (27) *The South India Mill Owners' Association, Madras*, (28) *Amalgamations, Limited, Madras*, (29) *Balantram Industries, Limited, Rajahmundry*, (30) *The Craftsman, Limited, Madras*, (31) *Factors Limited, Madras*, (32) *The Hindupur Vegetable Oils and Refineries, Limited, Hindupur*, (33) *Hindustan Co-operative Insurance Society, Limited, Madras*, (34) *Kamala Sugars, Limited, Udamalpet*, (35) *Sri Kannabiran Mills, Limited, Coimbatore*, (36) *The Kasturi Industrials, Limited, Coimbatore*, (37) *Modi and Modi, Madras*, (38) *T. K. Nair and Sons, Ottapalam, Malabar*, (39) *The Rajeswari Mills, Limited, Gudiyattam*, (40) *Seshasayee Brothers, Limited, Trichinopoly*, (41) *The South Indian Products and Industries, Limited, Tinnevelly*, (42) *Sree Mahalakshmi & Co., Madras*, (43) *The Standard Crucible works, Rajahmundry*, (44) *The Tirumurti Mills, Limited and* (45) *The United Glass Works, Limited, Madras*: I am in favour of the constitution of permanent Regional Industries Boards consisting of both officials and non-officials.

(1) *Sri P. B. Doraiswamy, Industrial Engineer, Chittoor*, (2) *Sri T. A. Ramalingam Chettiyar, Coimbatore and* (3) *The Tuticorin Mills, Limited*: Only one Central Board consisting of a large number of members both officials and non-officials should be constituted.

(1) *Sri A. S. Kuppuswami, Tinnevelly and* (2) *Mr. F. Albuquerque, Mangalore*: A permanent Regional Industries Board is not necessary at present. The Industries Department may perform the function.

(1) *Sri Y. Mahabaleswarappa, Bellary and* (2) *Chari and Chari, Limited, Madras*: I am in favour of the constitution of a permanent Central Board with Regional Industries Boards but they should consist of non-officials.

Dr. A. V. Varadaraja Ayyangar, Bangalore: The Government may constitute one Board consisting of the Minister of Industries as Chairman, an Engineer, a Chemist, a Financier or an Industrialist, Finance Minister, Agriculture Minister, Director of Industries and Commerce and two gentlmen from public.

The Sudarsan Oil Mills, Limited, Madras: The system of Permanent Regional Industries Boards controlled by a Central Board is rather roundabout. The Provincial Governments have to be given the necessary powers.

Q. 11—Would you recommend the imposition of a limitation on the dividend, which should be paid to investors in joint stock industrial enterprises ?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district,* (2) *Sri S. Chakrapani, B.A., B.L., Cuddalore O.T.,* (3) *Messrs. C. V. Cheru and Sons, South Malabar,* (4) *Mr. K. A. Joseph, M.A., Presidency College, Madras,* (5) *Sri Y. Mahabaleswarappa, Bellary,* (6) *The South Indian Mill Owners' Association, Madras,* (7) *Chari and Chari, Limited, Madras,* (8) *Chitra & Co., Madras and* (9) *Factors Limited, Madras* : I do not recommend the imposition of a limitation on the dividend but I suggest that provision should be made for the reservation of 25 per cent of the net profits.

(1) *Sub-Committee of the Industrial Planning and Development Committee,* (2) *Sri P. B. Doraiswami, Industrial Engineer, Chittoor,* (3) *Sri H. Joga Rao, Radio Engineer, Madras,* (4) *Sri A. S. Kuppuswamy, Tinnevelly,* (5) *Messrs. P. B. Kurup and P. V. D. Menon, Calicut,* (6) *Sri P. N. Menon, Malabar,* (7) *Sri R. Natarajan, Mylapore,* (8) *Sir P. A. Palaniswami, Rasipuram,* (9) *Sri C. Rajam, Mylapore,* (10) *Sri B. S. Ramiah, Bangalore,* (11) *Sri S. V. Ranga Rao, Guntur,* (12) *Sri V. V. L. Rao, Madras,* (13) *Sri S. N. N. Sankaralinga Ayyar, Madras,* (14) *Mr. A. K. Sharfudin, Trichinopoly* (15) *Sir T. S. Venkataraman, T. Nagar,* (16) *Sri R. Yamakuttia Pillai, Sikkil.* (17) *Andhra Provincial Ryots' Association, Bezwada,* (18) *The Salt Manufacturers and Merchants Association, Tuticorin,* (19) *Amalgamations, Limited, Madras,* (20) *Balantram Industries, Limited, Rajahmundry,* (21) *The Craftsman, Limited, Madras,* (22) *Kamala Sugars, Limited, Udamalpet,* (23) *Sri Kannabiran Mills, Limited, Coimbatore,* (24) *T. K. Nair and Sons, Ottapalam, Malabar,* (25) *The Standard Crucible Works, Rajahmundry,* (26) *The Tirumurti Mills, Limited and* (27) *The United Glass Works, Limited, Madras* : I recommend the imposition of a limitation of dividend which should be paid to investors in joint stock companies.

Dr. A. V. Varadaraja Ayyangar, Bangalore : It is difficult to impose a limitation on the dividend for the investor since he is prepared to risk money initially by subscribing to the Capital in the hope that it will give him a decent return.

(1) *Sri C. J. R. Varaprasad Rao, Bezwada,* (2) *Mr. F. Albuquerque, Mangalore,* (3) *The East Godavari district Fishing Communities Union, Cocanada,* (4) *The Hindupur Vegetable Oils and Refineries, Limited, Hindupur,* (5) *The Kasturi Industries, Limited, Coimbatore,* (6) *Modi and Modi, Madras,* (7) *The Rajeswari Mills, Gudiyattam,* (8) *The South Indian Products and Industries, Limited, Tinnevelly,* (9) *The Sudarsan Oil Mills, Limited, Madras,* (10) *The Tuticorin Mills, Limited and* (11) *The Andhra Pharmaceutical Works, Limited, Bezwada*: The imposition of any limitation on the dividend paid to the investors in Joint Stock industrial enterprises may retard their enthusiasm to invest in them due to limited returns.

Q. 12.—Do you recommend the sharing of profits, after payment of a limited dividend and after provision for reserves, between capital, management, executive and labour? If so, in what proportions ? Please give reasons for your answer.

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district,* (2) *Sri S. Chakrapani, B.A., B.L., Cuddalore O.T. and* (3) *The South Indian Products and Industries, Limited, Tinnevelly* : I am not in favour of sharing of profits after payment of a limited dividend and after provision for reserves.

(1) *Sub-Committee of the Industrial Planning and Development Committee,* (2) *Messrs C. V. Cheru and Sons, South Malabar,* (3) *Sri P. B. Doraiswamy, Industrial Engineer, Chittoor,* (4) *Sri H. Joga Rao, Radio Engineer, Madras,* (5) *Mr. K. A. Joseph, M.A., Presidency College, Madras,* (6) *Sri A. S. Kuppuswamy, Tinnevelly,* (7) *Sri R. Natarajan, Mylapore,* (8) *Sri P. A. Palaniswami, Rasipuram,* (9) *Sri C. Rajam, Mylapore,* (10) *Dr. A. V. Varadaraja Ayyangar, Bangalore,* (11) *Sri C. J. R. Varaprasada Rao, Bezwada,* (12) *Sri R. Yamakuttia Pillai, Sikkil,* (13) *Mr. F. Albuquerque, Mangalore,* (14) *Chari and Chari, Limited, Madras,* (15) *The Crafstsman, Limited, Madras,* (16) *The Rajeswari Mills, Limited, Gudiyattam and* (17) *The United Class Works, Limited, Madras* : The sharing of profits can be done only in the shape of bonuses, provident fund and other benefits according to the nature of responsibilities taken personally in the interests of the concerns.

(1) *Sri Y. Mahabaleswarappa, Bellary,* (2) *Sri P. N. Menon, Malabar,* (3) *Sri B. S. Ramiah, Bangalore,* (4) *Sri T. A. Ramalingam Chettiar, Coimbatore and* (5) *Sri S. V. Ranga Rao, Guntur* : Profit to some extent should be shared with labour. Earmarking a portion of profit is enough.

(1) *Sri V. V. L. Rao, Madras,* (2) *Balantram Industries, Limited, Rajahmundry and* (3) *The Tuticorin Mills, Limited.* I recommend the sharing of profits in the ratio of 1 : 1 : 1 : 1, i.e., all concerned to avoid all strikes and discontent.

Sri S. N. N. Sankaralinga Ayyar, Madras : I favour the idea of sharing of profits. Managing Agents should not be entitled to any percentage in profits, unless a dividend of at least 5 per cent is paid on capital, and be entitled to a graded percentage of the profits up to a maximum of 10 per cent according to profits made. At least 10 per cent of the profits to be set apart for executive and labour.

(1) *Mr. A. K. Sharfudin, Trichinopoly*, (2) *Mr. M. N. Abdul Majid, Sikkil and* (3) *Sri Kannabiran Mills, Limited, Coimbatore* : Dividend should be limited to 6 per cent tax-free. Of the balance of amount 1/3 should be set apart for lean years, 1/3 as bonus for labour and the rest 1/3 for price reduction.

(1) *Sri C. V. Thyagarajan, Madras and* (2) *The Kasturi Industries, Limited, Coimbatore* : I recommend the sharing of profits after payment of a limited dividend in the proportion of ½ and ½ between capital and labour.

Sir T. S. Venkataraman, T. Nagar : It would be conducive to all concerned to have the profits shared between capital, management, the agriculturist in the case of agricultural industries and labour.

Andhra Provincial Ryots' Association, Bezwada : The profit should be after deducting 5 per cent interest on Capital, wages to all the staff and labourers. The profits can then be divided thus 1 : 1 : 1 : 2 or a better portion to the labourers according to the nature of the industry.

The Salt Manufacturers and Merchants Association, Tuticorin : The total profit should not be allowed to exceed 33 1/3 per cent and the following reservation should be made.

Reserve 7½ per cent ; upkeep, etc. 7½ per cent ; depreciation 2 per cent ; Investors 10 per cent ; Management 3 per cent ; Labourers 2 per cent and Government taxes 1 1/3 per cent.

(1) *Chitra & Co., Madras and* (2) *The Hindupur Vegetable Oil and Refineries, Limited, Hindupur* : Profit sharing may result in increased production and improve efficiency and reduce interruptions in production. A system of profit sharing is better than a bonus payment.

Factors, Limited, Madras : The profit be shared after payment of 5 per cent dividend to shareholders tax-free and after providing 20 per cent of the profit for reserves. One-third of the surplus profit thus arrived at should be set apart for distribution amongst management, executive and labour out of which 15 per cent to management, 25 per cent to Executive and the balance of 60 per cent to the labour.

Kamala Sugars, Limited, Udamalpet : Sharing of profits may be done after the allowance of 7½ per cent for shareholders and provision for taxes, the balance may be set apart 25 per cent for reserves.

Modi and Modi, Madras : The present system of sharing the profits is about the best.

T. K. Nair and Sons, Ottapalm, Malabar district : The nett profits should be shared in the ratio of 60 to 40 per cent between Capital and Labour.

The Standard Crucible Works, Rajahmundry : The sharing of profits should be as below :

Capital 50 per cent, Management 20 per cent, Executive 15 per cent and Labour 15 per cent.

The Andhra Pharmaceutical Works Ltd., Bezwada : The sharing of profits can be shared as below :

Capital one-fourth and three-fourths between management, executive and labour.

Q. 13.—Do you favour the establishment of Work Councils in all industries, in which representatives of labour and executive can take part along with the management in discussing questions of common interest ?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district*, (2) *Sri S. Chakrapani, B.A. B.L., Cuddalore O. T.*, (3) *Sub-Committee of the Industrial Planning and Development Committee*, (4) *Messrs. C. V. Cheru & Sons, South Malabar*, (5) *Sri H. Joga Rao, Radio Engineer, Madras*, (6) *Mr. K. A. Joseph, M.A., Presidency College, Madras*, (7) *Sri A. S. Kuppuswami, Tinnevelly*, (8) *Messrs. P. B. Kurup and P. V. D. Menon, Calicut*, (9) *Sri Y. Mahabaleswarappa, Bellary*, (10) *Sri P. N. Menon, Malabar*, (11) *Sri R. Natarajan, Mylapore*, (12) *Sri P. A. Palaniswami, Rasipuram*, (13) *Sri B. S. Ramayya, Bangalore*, (14) *Sri S. V. Ranga Rao, Guntur*, (15) *Sri V. V. L. Rao, Madras*, (16) *Sri S. N. N. Sankaralinga Ayyar, Madras*, (17) *Sri C. V. Thyagarajan, Madras*, (18) *Sri C. J. A. Varaprasada Rao, Bezwada*, (19) *Sri P. Yagneswarudu, West Godavari*,

(20) *Sri R. Yamakkuttia Pillai, Sikkil*, (21) ***Mr. M. N. Abdul Majid, Sikkil***, (22) *Andhra Provincial Ryots' Association, Bezwada*, (23) *The East Godavari District Fishing Communities Union, Cocanada*, (24) *The Salt Manufacturers and Merchants Association, Tuticorin*, (25) *The South India Millowners' Association, Madras*, (26) *Amalgamations, Ltd., Madras*, (27) *Balantram Industries, Ltd., Rajahmundry*, (28) *Chari and Chari, Ltd., Madras*, (29) *The Craftsman, Ltd., Madras*, (30) *Factors, Ltd., Madras*, (31) *The Hindupur Vegetable Oils and Refineries, Hindupur*, (32) *Kamala Sugars, Ltd., Udamalpet*, (33) *Sri Kannabiran Mills, Ltd., Coimbatore*, (34) *The Kasturi Industries, Ltd., Coimbatore*, (35) *Modi and Modi, Madras*, (36) *T. K. Nair & Sons, Ottapalam, Malabar*, (37) *The Rajeswari Mills, Ltd., Gudiyattam*, (38) *The South Indian Products and Industries, Ltd., Tinnevelly*, (39) *Sree Mahalakshmi & Co., Madras*, (40) *The Standard Crucible Works, Rajahmundry*, (41) *The Sudarsan Oil Mills, Ltd., Madras*, (42) *The Tuticorin Mills, Ltd.*, (43) *The United Glass Works, Ltd., Madras*, and (44) *The Andhra Pharmaceutical Works, Ltd., Bezwada*: I recommend the establishment of Work Councils in all districts.

(1) *Mr. P. B. Doraiswami, Industrial Engineer, Chittoor*, (2) *Sri C. Rajam, Mylapore and* (3) *Dr. A. V. Varadaraja Iyengar*: The labour should have some voice in the management.

Mr. A. K. Sharfudin, Trichinopoly: The Works Councils established under Whitley's scheme have not proved a success. But the association of a representative of the workers in the Board of Directors might prove helpful.

Q. 14.—Are you in favour of continuing the present system of managing agency, which permits institutional management without requiring personal qualifications ?

(1) *Mr. S. M. Abdul Jameel Sahib, Melvisharam, North Arcot district*, (2) *Sri S. Chakrapani, B.A., B.L., Cuddalore O.T.*, (3) *Messrs. C. V. Cheru & Sons, South Malabar*, (4) *S i P. B. Doraiswamy, Industrial Engineer, Chittoor*, (5) *Sri K. A. Joseph, Presidency College, Madras*, (6) *Sri P. A. Palaniswami, Rasipuram*, (7) *Sri S. N. N. Sankaralinga Ayyar, Madras*, (8) *Mr. A. K. Sharfudin, Trichinopoly*, (9) *Sir T. S. Venkataraman, Thyagarayanagar*, (10) *Sri P. Yegneswaradu, West Godavari*, (11) *Andhra Provincial Ryots' Association, Bezwada*, (12) *The East Godavari District Fishing Communities Union, Cocanada*, (13) *Chitra & Co., Madras*, (14) *The Hindupur Vegetable Oils and Refineries, Ltd., Hindupur*, (15) *Kamala Sugars, Ltd., Udamalpet*, (16) *Sri Kannabiran Mills, Ltd., Coimbatore*, (17) *The Kasturi Industries, Ltd., Coimbatore*, (18) *Modi and Modi, Madras*, (19) *T. K. Nair & Sons, Ottapalam, Malabar district*, (20) *The Rajeswari Mills, Ltd., Gudiyattam*, (21) *The South Indian Products and Industries, Ltd., Tinnevelly*, (22) *Sree Mahalakshmi & Co., Madras*, (23) *The Standard Crucible Works, Rajahmundry*, (24) *The Sudarsan Oil Mills, Ltd., Madras*, (25) *The Tirumurti Mills, Ltd., and* (26) *The United Glass Works, Ltd., Madras*: I am in favour of continuing the present system of Managing Agency.

(1) *Sub-Committee of the Industrial Planning and Development Committee and* (2) *Sri S. V. Ranga Rao, Guntur*: For a certain period, say, five years, the present system of managing agency may be allowed to be continued.

(1) *Mr. H. Joga Rao, Radio Engineer, Madras*, (2) *Messrs. P. B. Kurup and P. V. D., Menon, Calicut*, (3) *Sri Y. Mahabaleswarappa, Bellary*, (4) *Sri P. N. Menon, Malabar* (5) *Sri S. Panduranga Rao, Coimbatore*, (6) *Sri C. Rajam, Mylapore*, (7) *Sri B. S. Ramiah,, Bangalore*, (8) *Sri T. A. Ramalingam Chettiar, Coimbatore*, (9) *Sri V. V. L. Rao, Madras*, (10) *Sri C. V. Thyagarajan*, (11) *Dr. A. V. Varadaraja Iyengar, Bangalore*, (12) *Sri C. J. R. Varaprasada Rao*, (13) *Sri R. Yamakkuttia Pillai, Sikkil*, (14) *Amalgamations, Ltd., Madras*, (15) *Chari and Chari, Ltd., Madras*, (16) *The Craftsman, Ltd., Madras*, (17) *T. K. Nair & Sons, Ottapalam, Malabar*, (18) *The Estates India, Ltd., Coimbatore and* (19) *The Tuticorin Mills, Ltd.*: I am not in favour of continuing the present system of managing agency.

Mr. F. Albuquerque, Mangalore: Managing Agencies are increasing in number and promoters like to form themselves into a managing agency for fear of being turned out of control of affairs by scheming shareholders. At the same time the work of these managing agencies may be scrutinized by an official organization.

The South India Mill-owners' Association, Madras: Managing Agency system with certain restrictions and limitations must continue.

Balantram Industries, Ltd., Rajahmundry: The existing managing agency system can be allowed for the time being for a period of ten to twelve years.

The Andhra Pharmaceutical Works, Ltd., Bezwada: Managing agents must be made to have a technical competency for the management of the industry and this should be ensured by legislation.

MINUTES OF A MEETING OF REPRESENTATIVES OF THE MADRAS CHAMBER OF COMMERCE, SOUTHERN INDIA CHAMBER OF COMMERCE, ANDHRA CHAMBER OF COMMERCE, MUSLIM CHAMBER OF COMMERCE, EMPLOYERS' FEDERATION OF SOUTHERN INDIA, MADRAS TRADES ASSOCIATION, SOUTHERN INDIA MILL-OWNERS' ASSOCIATION, AND THE ALL-INDIA MANUFACTURERS' ORGANIZATION, HELD AT 'DARE HOUSE', MADRAS, ON WEDNESDAY, THE 6TH AUGUST 1947 AT 4 P.M.

Present:

Mr. V. Pandurangiah (*in the Chair*).
,, W. T. Williams.
,, J. H. Phillips.
,, C. P. Johnstone.
,, A. E. Thompson.
,, G. B. Gourlay.
,, D. Allerton.
Mr. D. V. Bulloch.
,, G. K. Devarajulu Naidu.
,, T. V. Ethirajulu Chetty.
,, C. Seshachalam.
,, A. M. M. Murugappa Chettiar.
,, M. S. A. Majid.
,, W. Fyfe (*Secretary*).

The meeting was convened to prepare a consolidated joint reply to the questionnaire of the Industrial Planning Committee. The various questions were examined and discussed in order and the following replies agreed on unanimously :—

Q. 1.—What industries, in your opinion, should be started immediately, so as to facilitate the rapid industrialization of this Province ? What are the facilities which are available for the starting of such industries ?

Q. 2.—Have you considered the prospects of new industries which could be started and could successfully function in your district ? If you have, please send a note on the nature of such industries and classify them into (i) those that can be started and can begin to operate in less than three years and (ii) those, the operation of which will take more than three years. Please refer to the facilities which your district offers for the starting of such industries, such as raw materials, capital, skilled and unskilled labour, power, markets, etc. In the list of new industries that can be started specify those which may require less than rupees five lakhs and those which may require more than rupees five lakhs as capital.

Answers 1 & 2.—The question is so complex that it seems advisable to appoint a small sub-committee of experts to survey industrial resources, to ensure that priority is given to harnessing natural resources and that industry is dispersed and not overcrowded in one area.

The expert committee should have access to all available relevant Government records, findings, geological reports, etc., e.g., the Textile Planning Committee's report.

Q. 3.—If you are already interested in the management of any existing industry, please say whether you experience any difficulties in the successful working thereof or in expanding it and how, in your opinion, the Government could help you to overcome them ?

Answers.—This can best be replied to by individual industrialists as and when occasions arise but Government can do a great deal to assist in developing existing industries particularly by facilitating the process of acquiring land for factory sites, housing colonies, farms, etc. At present fragmentation of holdings frequently makes private purchase of suitable factory sites impossible. Development may further be assisted by overhaul of the existing machinery for the issue of mining licences. It is reported that at present it takes up to two years to obtain a prospectors' licence and still longer before actual mining operations can be started. It is further desirable to permit the free importation not only of capital goods but of materials required for the construction and maintenance of factories. Government should also adopt a positive and firm policy in regard to labour in order to counteract unfair and excessive labour demands which are on the increase in this Presidency.

A reduction in controls would undoubtedly assist further development and it is also suggested that section 23 (*a*) of the Income-tax Act, whereby private limited companies are compelled to disburse 60 per cent of each year's profit in

dividends, should be held in abeyance, thereby enabling such companies to conserve their resources for capital expansion, at all events until the reserves equal paid-up capital.

The Premier Mills (CBE), Ltd. having obtained a licence for importing of machinery, applied to the Iron and Steel Controller for iron materials for the construction of their factory building, but only 149·45 tons were sanctioned and the balance reported to be under consideration. Even against the licensed quantity of 149·45 tons only 18·3 tons were supplied, the licence for the balance quantity of 131·15 tons being cancelled as time expired. The building work is now handicapped for want of materials, and the machinery is expected to arrive in the first quarter of 1948.

The Textile Industry is next in importance to Agriculture in India. In the absence of sufficient cloth to clothe the teeming millions of India, it is absolutely necessary to increase production. It is therefore advisable to start manufacturing textile machinery in India itself and full support should be given to this Industry by the Government by way of adequate and quick supply of raw materials.

The Textool Company started in Coimbatore for the manufacture of textile spinning machinery cannot obtain sufficient pig iron and coke or an adequate quota of steel from the Central Government. With the assistance of the Government this Company could fill a real need in producing spinning machinery.

The Textile Machinery Corporation, Ltd. was started on 5th December 1945 after making experiments which proved manufacture to be possible and the necessary sanction was obtained from the Goverment of India for floating the company. Later, the Government of India sent a delegation of industrialists to the U.K. who have contacted the manufacturing units and a scheme of starting a firm has been settled and we understand, it is proceeding apace and the shares have also been offered to the mills for the above Combine in proportion to the spindleage. Representations have been made to the Government of India and the Madras Government that the concern already started in Coimbatore should be allowed to work and at least a part of the manufacture proposed by the Combine should be established in the South. It is therefore desirable that this Company should be encouraged to start manufacturing of textile machinery, spares and tools with all the assistance that the Local Government can give.

Q. 4.—If you have obtained permission to start a new industry, please say when you expect it to begin functioning and, if you are experiencing delay, the reasons therefor ?

Answer.—This is for individual industrialists but it may be noted that it is reported that certain schemes for development are being held up for want of machinery, for example, people, who have obtained permission to start textile mills under the Post-war Textile Mill Allotment, say, that they could not make rapid progress with regard to the constructions of factories in view of existing difficulties regarding supply of building materials like steel, iron and cement. This is due to the control and procedure prescribed in the matter of supply of these materials by the Government.

Q. 5.—What are the mineral resources available in your district ? Are they being exploited ? If not, give reasons for the failure to exploit them ?

Answer.—There appears to be a need for a thorough up-to-date survey of the mineral resources of the Presidency as a whole. Such survey should be conducted for Government by an expert and practical Geologist and not left to industrialists in individual districts.

Q. 6.—What industries, in your opinion, should be completely nationalized ? What criteria would you suggest for nationalization of industries? What industries, do you think, should receive State-aid and what should be left wholly to private enterprise ? Do you favour any sort of Governmental control over all industries irrespective of the fact whether they are State-aided or not ?

Answer.—In general, nationalization of industries should be resorted to only when the alternatives would lead to the denial to the public of goods or services considered to be desirable or necessary. Examples would be a Hydro-Electric or Irrigation undertaking too large in scale for private capital, or the exploitation by a monopolist of some necessity of life, which seldom happens in normal times.

Nationalization may be feasible for Ordnance Factories, Railways, Airways, Fertilisers, Salt and Forest Utilization Schemes, Canals, and Government Printing,

but nationalization is not always the best remedy. The desired result could better be achieved by some control or check over industry, without the necessity of taking it over physically by the State. Human nature being what it is, unless there is the spur of financial gain and competition, service to the public tends to deteriorate, and it is believed that State control of industry without these incentives, which are the public's only safeguard, would result in a lowering of efficiency and standard of service, together with an increase in costs. The case of the Madras Telephones may be quoted as an instance where rates have been raised and efficiency has deteriorated within recent months. Amongst other instances of loss sustained in Government control of industry the case of the New South Wales Government in Australia may also be quoted. It is stated that this Government has recently lost £314,000 on the management of State trawlers, £23,000 on a power station, £324,000 on timber yards, £28,000 on joinery works, £31,000 on the manufacture of bricks and £20,000 on the manufacture of lime. In the State of Victoria it is reported that Government working of coal mines resulted in a loss to the tax-payer of £96,192, in 1945–46. In Queensland experience has pursuaded the State to drop Government trading on a big scale, as a result of big losses amounting to more than £1,500,000 on cattle farms, £413,000 on coal mines and more than £54,505 on coke works. In shipping the Government of Australia has been equally unfortunate. The shipping lines which belonged to Government and which was sold in the early '30's' showed a trading loss of nearly £2,500,000 and the buses and trams of Newcastle and Sydney in New South Wales are expected to show a loss of £600,000 this year. With these instances before them the Committee consider that Government will do well to avoid nationalization of industry except when, as stated above, the only alternative would be prolonged hardship for the general public.

State-aid should be extended to new and nascent industries and to the development of existing industries in cases where an examination of local conditions shows that room for such development exists. In extending such aid, however, financial assistance should be given very sparingly, as it may be suspected that where such assistance is applied for, the promoters of an enterprise and their friends have little or no faith in the success of their proposals. In general Government control over existing industries should be discouraged, but some form of control over development and location of industry may be desirable in order to prevent over or under-development in any particular area.

Q. 7.—Besides giving financial aid, in what other ways can the State accelerate the growth of industries ? Can you mention specific industries which stand in need of such help and nature of the help required ?

Answer.—The Government can provide assistance for the establishment of new industries and the development of existing industries by provision of adequate and cheap supplies of power and water and rail facilities for sidings. All new Town-Planning Schemes should provide for industrial areas in suitable localities where cheap and ample power and water can be made available, where road and rail facilities exist and where arrangements can be made for suitable railway sidings.

An acute problem in connexion with the development of industries is the shortage of housing for workers. In the absence of planning, undesirable slums grow up and cannot easily be got rid of. The cost of housing to-day is beyond the purse of any private employer and cannot be borne without considerable assistance from Government.

Another difficulty which often confronts the private employer who constructs houses for workers in municipal areas, is that he is heavily taxed for those very amenities, such as streets lighting and drainage, for the provision of which he has had to bear the cost.

The schemes adumbrated by the Post-war Reconstruction Committee should be put through as quickly as possible, and in particular :—

(*a*) Establishment of Research Laboratories for each industry or a group of industries is essential.

(*b*) Facilities should be secured for the training in factories of students of Technological Colleges.

(*c*) An indirect encouragement could be given to industries by the Government by buying their products.

(*d*) The tax structure should be so framed as to help and promote rapid industrial development.

(*e*) The Tariff policy should be designed to give liberal protection to industries from foreign competition.

Q. 8.—Are you satisfied with the working of the State Aid to Industries Act? Do you suggest any amendments to it? Or, would you prefer the financing of industries to be left to a Finance Corporation? What powers and functions would you suggest for such a Finance Corporation?

Answer: The working of present State Aid to Industries Board is subject to a large measure of routine and red tape which appears to make it impossible to obtain prompt disposals of applications. The provisions for granting financial aid to industries are complicated and cumbersome. The present Act and its working would appear to be intended primarily to develop small scale industries. This may be either due to lack of funds or a narrow interpretation of the provisions of the Act. It cannot be said that any large scale industries have been developed under the provisions of the Act.

The formation of a Finance Corporation is desirable. The details have got to be carefully worked out, but the following may form a basis for discussion:—

The Finance Corporation should be established on the lines of the Central Land Mortgage Bank, Ltd., Government taking up 49 per cent of the capital, public institutions such as Insurance Companies, Banks, etc., 25 per cent, and the balance left open to private subscription. In the distribution of profits the Government should not be entitled to any profits till the 51 per cent held by institutions and private individuals get 2½ per cent to 3 per cent per annum. The Corporation should specialize in long-term industrial investments and should not compete with the existing banks whose advances are usally for short terms. The share capital of the Corporation should be guaranteed by the Provincial Government.

Q. 9.—Would you advise some system of licensing the starting of industries to ensure proper regional distribution and also to prevent the establishment of bogus enterprises?

Answer: No. Licensing is not desirable or necessary to ensure proper regional distribution.

Q. 10.—Do you favour the constitution of permanent Regional Industries Boards to be controlled by a Central Board to the Government in planning, regulation and establishment of industries? Would you have such Boards composed entirely of non-officials or officials or partly of both?

Answer: Yes, provided there is a non-official majority in each case, the non-officials not being nominated by Government but nominated or elected by commercial or industrial bodies and provided that the functions of such a body are not merely advisory.

Q. 11.—Would you recommend the imposition of a limitation on the dividend which should be paid to investors in joint stock industrial enterprises?

Answers: No. such limitation would render commercial working impossible in the case of undertakings involving any degree of risk. A waiting period before dividends can be declared is common to almost all new industrial enterprises. Any restrictions on dividends must be expected to stiffle new enterprises and should be regarded as a very dangerous proposal likely to retard rather than to develop the industrialization of the Province, and therefore it is considered that any attempt to limit dividends to the detriment of local (Provincial) industrial development should be strongly opposed.

No proposal for the limitation of dividends is reasonable which does not take account of the different forms of capital structures in common use. Part of the capital may be subscribed in the form of fixed interest securities, preference shares and debentures. Owing to these differing structures, widely varying proportions of total profit available for distribution fall to be divided among the ordinary shareholders and examples could be quoted in which two companies, each with the same total capital, but in different forms, could make the same profit and yet pay very different dividends to their ordinary shareholders. The imposition of a limitation upon dividends would be an entirely unsuitable method of controlling the allocation of profits between shareholders and labour, and could not be uniformly imposed without grave injustice to investors. In a conservativley managed concern, much of the capital employed in the business is in the form of reserves built up by prudent management over a long period of years. In such cases, and they are by no means rare, the issued capital is only a fraction of the total capital employed. In consequence, a limitation by rule of payment of dividends would operate unfairly as between this class of enterprise and new companies. An important duty of the directors of joint stock companies is to consider what proportion of profits should be

reserved for future development and what portion may be released to shareholders in the form of dividends. It is not to be expected that Government can create machinery, or apply a rule, which can supplant the directors in this highly technical aspect of their duties.

Q. 12.—Do you recommend the sharing of profits, after payment of a limited dividend and after provision for reserves, between capital, management, executive and labour ? If so, in what proportions ? Please give reasons for your answer.

Answer : The Committee support the principle of employees sharing in the prosperity of industry, but as labour exercises no control, it should receive adequate remuneration in the form of salary irrespective of whether the company makes a profit *or a loss*. The bonus system is outmoded and cash bonus should not be paid as it is impossible to connect extra profits convincingly or visibly within the minds of the labourers with the work actually done by them. If a concern is sufficiently prosperous it is considered that the labour should benefit not in cash payments over and above ordinary wages, but in improved living conditions, improved amenities and extra provision for retirement.

Q. 13.—Do you favour the establishment of Work Councils in all industries, in which representatives of labour and executive can take part along with the management in discussing questions of common interest ?

Answer : If the expression 'Works Council' can be read to mean 'Works Committees' provided for by the Industrial Disputes Act, the answer to the question is *Yes*.

Q. 14.—Are you in favour of continuing the present system of Managing Agency, which permits institutional management without requiring personal qualifications ?

Answer : The Managing Agency system has done a great deal towards the development of industries in India. It was this system which fostered industrial awakening and brought about the present stage of industrial development.

In countries where the Managing Agency system does not operate, companies are controlled by Boards of Directors many of whom have no technical or other qualifications other than the possession of capital. In India the general functions of the Managing Agents are similar to those of the Board of Directors in other countries, but in general, such Managing Agents bring to their work considerable technical administrative knowledge and experience. Experience shows that in India Managing Agency management have in the past been generally efficient and the continuance of this system may be regarded as an important feature in the further development of Indian industry.

II. It was agreed that the Chairman inform Government that a consolidated reply from the various bodies represented at the meeting will be submitted in the course of a few days and that he should also request that four representative industrialists might be associated with the present members of the Board in compiling their final report to Government. Subject to such adjustment as may be found, by the Chairman to be necessary, it was agreed that the names of Messrs. V. Pandurangiah, C. Seshachalam, W. T. Williams and Dr. Alagappa Chettiar be suggested as suitable persons to be so associated with the present Committee.

W. FYFE,
Secretary.

V. PANDURANGIA,
Chairman.

REPLIES TO THE QUESTIONNAIRE FROM THE LABOUR ORGANIZATIONS.

1. *Commonwealth Labour Union, Cannanore* : (1) Paper factories, factories for producing different oils, carpet making with coir, cane industry, factory for effecting improvement in jaggery and converting the same to sugar.

(2) (i) Coir, carpet production, preparation of ordinary and scented oils, different articles with cane, production of candles, etc. Industries to develop the above can be started as early as possible with less expenditure to Government.

(ii) Paper, sugar, cement and glass factories. Sugar to be manufactured from jaggeries, experimentally in the beginning, on co-operative basis with Government control.

(3) Not at present.

(4) Nil.

(5) Mica fragments, quick-silver and other minerals are available in different parts of the district. Not being exploited. Done to some extent in Cochin and Travancore. Failure is due to absence of State-aid and due to lack of technical education among the public.

(6) Spinning and weaving mills; tile and oil factories conducted by power should be nationalized. Government should take over all such existing industries. State-aid should be extended to cottage industries such as pottery, mat-making, toys, clay and wood. Forest in the valley of Western Ghats should be under Government.

(7) Besides financial aid, state can help the growth of industries placing at the disposal of such industries experts or experienced workers to give proper instructions at the early stage, e.g., production of paper, preparation of sugar, preparing pure honey, etc.

(8) Not satisfied with the working of the State-aid to Industries Act. Financing of Industries may be left to sub-committees under the control of the Government.

(9) Licence should be issued to stable persons before they start any industry. Their financial position must be well looked into. The licensing authority should be the head of the department of industries adviced by an advisory committee of officials and non-officials.

(10) Strongly endorse the idea. Such boards should be constituted of both officials and non-officials, the majority being non-official industrial experts.

(11) Idea is healthy. But there will be decrease in persons to invest money.

(12) A decent bonus on the profit to be distributed among management, executive and labour.

(13) Strongly support the idea.

(14) Not at all in favour of the present system. The managing agency should require personal, educational and technical qualifications.

2. *The Malabar Motor Transport Employees' Union, Tellicherry*: (1) Centra industrial workshops in each district so as to be of use to the existing and proposed industries of the district. Ex-servicemen who had acquired skill in various categories are available everywhere.

(2) Under clause (i) we can start sago manufacturing for which there is abundant raw material articles in Malabar and the capital required is not much. One lakh is more than enough to meet the requirements of this district.

Under clause (ii) glass factory, sugar factory and paper factory. They may require a capital of below 5 lakhs for each factory and raw materials are also available here.

(3) Nil.

(4) Nil.

(5) Mineral resources of this district have not been exploited at all to my knowledge. Many years back some engineers had taken quick-silver from a place near Dharmadam railway Station. In certain palces mica fragments are seen in abundance on the surface of the earth.

(6) Spinning and weaving by power should be nationalized. Handlooms weaving, as cottage industry, should be left to private enterprises. So also factories with less than ten power-looms should be treated as cottage industries. Dairy farms should have Government surprise inspection at least four times a year so that cows with tuberculosis tendencies or taints should be eliminated to ensure national well-being.

(7) Nil.

(8) Nil.

(9) Every new industry should have a licence before it begins work and the licensing authority of the district should be the District Industrial Officer assisted by a Board consisting of prominent industrialists who should act only as an advisory board.

(10) Yes. The Board should consist of the Industrial officers of the district as well as prominent industrialists.

(11) No. This would hamper with the proper functioning of the joint stock industrial enterprises. This would lessen the impetus of the enterprising investors to a great extent.

(12) A decent bonus for the fixing of which executive labour also should have a hand will serve the purpose. Failing this, the matter of fixing the bonus rate should be referred to an arbitration board consisting of a Government Auditor, the District Industrial Officer, the Managing Director or agency and two labour representatives.

(13) Yes.

(14) Certainly not.

3. *The Vizagapatam Sugars and Refinery Workers' Union, Tummapala*: (1) Brush manufacturing industry in our district. Raw material—palmyra fibre is abundantly available. Another sugar factory can be started immediately with a capacity of 500 tons as the cane produced in this and surrounding taluks will easily feed even 2 or 3 factories.

(2) Manganese industry—as raw material is available in northern parts of this district.

(3) Lac industry and tile factory. The present Sugar Factory at Thummapala of capacity 250 only can be expanded to more than 500. Labour is available.

(4) Toy industry—now at Etikoppaka.

(5) Manganese, which is not being exploited. Mud available in this taluk.

(6) Industries producing food products such as sugar must be nationalized. Such industries should primarily receive State-aid, if capital is not forthcoming if nationalized. Any industry employing more than 100 workers should be under some sort of Government control.

(7) Industrial experts are perhaps wanted.

(8) The idea of Finance Corporation is good. Money must be forcibly obtained on low interest from the rich.

(9) Industries are to be started near the sources of raw material.

(10) The Boards are better composed of non-officials and officials.

(11) Imposition of a limitation on the dividend at a low level is to be made.

(12) We strongly recommend sharing of profits by labour, who must have the largest share of all.

(13) Yes and the labour must have effective voice in that council.

(14) No.

4. *The E.I.D. and S.F., Ltd., Labour Union, Nellikuppam*: (1) Oil seed factory, cotton mills and coal mines industry. South Arcot is famous for groundnut and cotton. Government of India is contemplating to start coal mines between Cuddalore O.T. and Vridhachalam. Rich coal ores have been found out.

(2) The above three industries can be started immediately and it can be finished within 3 years. Raw materials are easily available. Skilled and unskilled labour are easily available. It is a business district famous for marketing. Nos. 1 and 2 can be started within 5 lakhs. No. 3 requires more capital.

(3) Vanaspathi and Dalda at Villupuram, groundnut oil production company at Cuddalore O.T. by Ralli Bros., are quite successfully working without any Government help. They should be nationalized.

(4) A good amount of response is available from the public if it is started earlier and all are anxious to start industries to develop our Independent India.

(5) No mineral resources are available. Coal mines are operated by the Government of India.

(6) The Local Motor Transport and the E.I.D. and S.F., Nellikuppam, must be immediately nationalized. The proposed oil mills and cotton mill may be started under Government control.

(7) In starting the cotton mill in South Arcot, Government should supply machinery and other materials besides financial help as there are no cotton mills in South India in large numbers.

(8) I have not gone through the Industries Act and the duty of Finance Corporation. Please supply the said copies for my information.

(9) I advise the Government to adopt the system of licensing to ensure proper distribution.

(10) Yes. The Board must be composed of non-officials and officials to work under nationalization.

(11) No.

(12) Yes. I recommend 50 per cent of the net profit must go to the labour in the shape of bonus. The remaining 50 per cent may be allotted for reserve, capital, management, executive and labour.

(13) Yes.

(14) No. The managing agency always plays a corrupted life in the matter of profit and is injurious to the working class.

5. *The Madura Motor Labourers' Union, Madura* : (1) Automobile factories, sugar factories, cement factories, engineering factories, existing workshops in Madura for automobile and engineering, raw materials in Tungabhadra for cement, skilled, unskilled workers, etc., are facilities.

(2) In less than three years, all the above 4 can be started. Excepting automobile and engineering others will require less than Rs. 3 lakhs as capital. In Tirumangalam the soil is fit for cement factories, dry place with plenty of workers. In Vadipatti a sugar factory has been started. T.V.S. and several motor companies have workshops in Madura.

(3) By taking over the existing T.V.S. workshop, the Government can improve and make it a big automobile factory not only for building chassis but for manufacture of spare parts and engines necessary.

(4) No.

(5) Near Kottampatti minerals like iron are available.

(6) Automobile industry and engineering industry must be completely nationalized—as Transport is to be for public interest fully and the income is fabulous—State should aid cement factories and sugar factories. Weaving and spinning mills must be State controlled to start with.

(7) Government should start new industries.

(8) The Government can appeal for funds to start industries on its own capital.

(9) Starting of industries should be planned and controlled by Government.

(10) Boards should consist of all interests in which majority should be representatives of workers and the general public.

(11) Yes, for purpose of improving industry and enriching the State.

(12) We recommend sharing of profits among the workers.

(13) Yes, we favour establishment of work council for production as well as for general conditions of working.

(14) Present managing agency system must be abolished.

6. *Pandalapaka Factory Labour Union, West Godavari* : (1) Heavy industries such as textiles, engineering, ship building and transport industries as motor manufacturing.

(2) Shipping and textiles can be immediately started at Cocanada (sea port). These may be started by the Government itself and capitalists are also coming forth to such. Coir industry can be immediately started at Cocanada where there is lot of raw material.

(3) Nil.

(4) In Rajahmundry wood is available from forests and building materials and furniture manufacturing workshops can be immediately started.

(5) The existing textile industry in the district (5 mills) should be immediately nationalized as they are badly managed to the detriment of public interest.

(6) Nil.

(7) Nil.

(8) Nil.

(9) Some bogus enterprises are also raising their dirty hands and so the Government should not only take charge of the existing ones especially paper mills at Rajahmundry but also control new ones that are coming up.

(10) The Control Boards should have non-official representatives from Trad Unions interested in such industries.

(11) Yes, only limited percentage of profits should be allowed and the rest used for further development of the industry.

(12) Nil.

(13) Work councils should be formed with Trade Union representatives.

(14) The system of managing agency should be prohibited.

APPENDIX III.

(See Chapter I, paragraph 4.)

NAMES OF WITNESSES EXAMINED AND SUMMARY OF THEIR EVIDENCES.

1. *Dr. Sir Rm. Alagappa Chettiar.*—The Industrial Finance Corporation should be created by legislation. Capital should be contributed by the Government, Joint Stock Companies and other institutions. Private persons may also take shares. The capital should be at least Rs. 2 to 3 crores and borrowed capital 4 to 5 times this amount. Government may issue 10 or 15 years' debentures. The rate of interest on the borrowed capital of the Corporation should be slightly more attractive than the borrowing rate of the Provincial or Central Governments, say one per cent or at least half per cent more. The Government should guarantee a certain dividend on capital which must be half per cent more than the borrowing rate. The majority of the Directors should be elected by the share-holders. Representation on the Board of Directors must be limited so that it must be fairly broadbased and all kinds of responsible interests are properly represented. The Government should not have the power of VETO as it will ultimately reduce the institution to a one man rule. Government may control transactions involving more than Rs. 10 or 15 lakhs. Others may be left to Directors. Government financial assistance to a company should not be more than one-third of the entire financial structure of the company. No expert body need be set up by Government on a permanent basis to examine schemes submitted to the Corporation. Government may have a few experts. If there are schemes which do not come within the purview of these experts, they can be referred to experts in the line.

2. *Mr. S. Narayanaswami of Messrs. Chitra & Co.*—Industrial Finance Corporation should be created by statute. Stock holding should be confined to Government and other institutional investors like the banks and insurance companies, Government taking 51 per cent of the shares; institutions outside this Province, industrial concerns or private persons should be excluded; also those who had vested interests in industry. Capital of Corporation should not have any reference to what it borrows by way of debentures. Outsiders may take debentures. Rate of interest on debentures should be substantially above the return on guilt edged—say 3½ per cent. Government should predominate on the directorate. Government might guarantee a minimum return on the shares even from the outset.

3. *Mr. Gopala Ayyar of Indian Bank, Ltd.*—Industrial Finance Corporation should be created by statute. Rs 50 lakhs might be the paid up capital and ten times that amount may be borrowed. Government should hold 51 per cent of the capital. Shares should be taken by the institutions in this Province, private persons and interested institutions being excluded. The term of debentures may be from 10 to 20 years. Interest may be 3½ per cent. Government should guarantee principal and interest. Minimum dividend of 3½ per cent may be guaranteed. Speculative industries should be avoided. Financial assistance to concerns should be limited to 25 to 33⅓ per cent of their capital and financial reserves.

4. *Mr. Anantarama Krishnan of Messrs. Simpson & Co.*—Industrial Finance Corporation should be subject to the Indian Companies Act. Initial capital should be in the neighbourhood of Rs. 10 crores. Subscriptions to share capital should be wide open inside and outside the Province. Maximum number of shares to be held by one may be limited. Government may take 25 per cent of shares. If Government guarantee repayment of debentures issued and interest, all the money

required will be forthcoming. Government taking 51 per cent of shares in Corporation is not acceptable nor Government having a controlling interest ever the Corporation. The appointment of some non-officials as Directors by Government without their having a controlling power will not change the position. He, however, agrees to the Government retaining the power of vote. Government need not guarantee any minimum dividend on share capital. Foreign capital will be forthcoming. Directors should belong to Madras Province. The Board should represent all major industries, like textiles, engineering--cement, etc. Quick decisions should be arrived at by the Corporation.

5. *Mr. A. C. K. Krishnaswamy, Madras—Paper and Chemicals.*—Three paper factories of 15 ton units each should be started in Madras to make it self-sufficient, one in Tinnevelly, one in Nilgiris (Wynaad) and the third in the northern parts (near Vizagapatam) where a special variety of bamboo is available. Caustic soda and bleaching powder which are now imported, should be manufactured in the country, if the paper industry is to work as an economic unit. Paper industry should not be nationalized, because the State is at present unfit to manage or start an industry. State may control the paper industry. Protection should be given to the paper industry by the State, but it cannot start the industry and produce paper in the cheapest and most economic way. Private talent will not be available to Government because of restrictions in Government service.

Soda Ash industry was started by witness in 1944. There was a delay of 18 months in getting Government sanction and by the time the industry came to its own, the market had deteriorated and difficulty is also caused by the prospect of nationalization of the industry without compensation. Punjab in the North India and Tinnevelly in South India are the best places for Soda Ash Industry. The normal economic unit is about 100,000 tons a year. Besides capital issue, concessions by the State are required in regard to price of limestone and salt and railway freight. Protection from unfair competition is required for this industry.

State Aid to Industry Act is not helpful for any industry and may be scrapped.

Labour is largely led away by outsiders who work with a political motive, not caring for labour interests. Labour unions should have a share in profits as well as in the responsibility. Gopalaswamy Ayyangar Award, which gives 30 per cent of profits to labour may be tried. Labour is not enlightened here and workshop committees will not work in practice.

6. *Mr. K. V. Subba Rao, Madras—Pharmaceuticals, Sugar and Engineering.*—The existing units for sugar industry in this Province are enough for self-sufficiency.

As regards off-seasonal employment of labourers, it was suggested that in addition to production of sugar, refineries should be started for refining sugar and palmyra jaggery. Alcohol and power alcohol may be manufactured as by-products. Better price must be paid to the agriculturists, who grow cane and this is preferable to payment of bonus by the factory owner to the cane grower. If prices are not controlled, things will adjust in about five years. The agriculturist must be allowed to sell cane for the manufacturing of sugar or jaggery, as he likes. Credit facilities should be given to agriculturists through co-operative societies so that they may not borrow from factory owners on the mortgage of the future crop.

The Vanaspathi plant can be converted to produce any other substances.

Glass industry can be improved in the Province.

7. *Mr. N. Ranganathan, 25, Godown Street, Georgetown, Madras.*—Application for capital issue for starting an industry for manufacture of leatherette in this Province was rejected by the Government of Madras. The Director of Industries was asked for help in regard to power and allotment of ordinary packing cloth. A note on the industry prepared by an English expert was also given to the Director. The latter rejected the application saying that it was not possible to supply for ndustrial purposes the cloth intended for civil supplies.

8. *Sri G. Sundaram, Chief Engineer, Electricity.*—He gave details of the existing electric power systems and the programme of power development which the Government propose to undertake. There will not be much difficulty in supplying power both to industries and agricultural purposes when the maximum output was developed. Seasonal requirrements of industry and agriculture could also be met from the power plants and this subject would be investigated.

Government had to import all the basic power plants and other electrical articles from outside India and it was a deplorable state of affairs. During the War period especially they had to stop some of the plants for want of spare parts. It was

therefore better than that the country started a Basic Power Plant industry. The demands of a particular province were not quite sufficient to warrant the starting of this industry. So the centre should take up this question. The provinces could contribute the share capital.

In the actual administration of this public utility undertaking the Government machinery was totally inadequate. It cannot move fast enough and reach decisions quickly. A State Planning Commission was very necessary. The State Planning Committee should co-ordinate the activities of the different units working under it and lay down their objectives and implement them into concrete ways. There should be an integrated policy. The Central Committee should frame plans. The executive body should be given full powers to vote money, etc. A note on power development prepared by the Chief Engineer is printed as Appendix X.

9. *K. Seshachalam Chowdary, Principal and Research Chemist, Institute of Leather Technology, Washermanpet.*— He has submitted a note which is printed as Appendix XVII.

10. *Dr. Govinda Rau, Principal, A.C. College of Technology, Guindy.*—There are three courses of study in the college, viz., leather technology, textile technology and chemical engineering. Each course lasts for two years.

In the first year there are certain common courses, such as lectures in Chemical and General Engineering, Drawing, Practical Mathematics, Workshop practice.

During the first year itself, the Leather and Textile Technology students go for two days in a week to Washermanpet and get practical training. The idea is that they should learn to handle the machines themselves. In the second year, practically they spend all the time in Washermanpet. They come only once in a week to Guindy to take lectures on Industrial Economics and Administration and also in general chemical technology along with the other students. Candidates take B.Sc. (Tech.) degree of the Madras University. Practical work in Chemical Engineering consists in experimentally studying the principles on which the equipment are designed and in determining their efficiency under given operating conditions. The college has got representative equipment for this work. The students have to take a practical training in factories for periods ranging from three to six months. The Chemical Engineering students are deputed to any type of Chemical Factory, Cement, Oils, Sugar, Fertilizers, etc., as their training is the design and operation of unit types of plants which are common factors in groups of industries. They will get better opportunities, when a new factory is erected or when factories are closed down for overhauling and tuning up.

Unless we have got good chemical engineers in the factories these boys do not get proper training. They must be given proper training by the professional chemical engineers.

Erection of factories can take place once in the case of a factory. So there are limited opportunities for practical training of this type. As personal attention should be paid to the students, the number of each course should be limited to 20 or 15. We contemplate in future adding such other courses as Ceramics, Textile Chemistry, etc. These were originally contemplated, but we could not start then for want of facilities. Metallurgy and Rubber technology may be added. There is staff in the college who do research work. Specific enquiries for technical information and advice from trade can be attended to. Graduates from this college are all qualified to take up research.

There is minimum staff for Chemical Engineering. Almost all necessary equipment have been received and have to be erected and fitted up for use. There must be a Research Department for each subject and Research staff will give short courses on their subject.

The Government should consult academic men and experts in their planning.

The college can give technical information available in published literatures and conduct pilot plant investigations required (1) to test raw materials available, or modifications in processes to suit local conditions, (2) to work out complete details for design and fabrication and erection of any proposed new process, and (3) to evaluate the economics of the proposed industry. Students in this college in Chemical Engineering are qualified to take up such pilot plant investigation. They have a practical knowledge of all unit equipment and processes, but will have to build up experience for the judicious application of this practical knowledge. Caustic soda is a basic and established industry for erecting a factory. We must write to foreign firms already specialising in this line and get details, and these

must be evaluated in terms of local conditions. The advice of those who have previous experience in this country will be helpful to arrive at a decision. A part of the equipment can be designed and fabricated locally, but the essential equipment like the cells are better purchased from specialist makers.

11. *Mr. T. G. Armstrong, Messrs. Parry & Co., Madras*: He considers that existing factories in South India should be allowed to expand up to 800 tons cane crushing capacity per day and then only new factories should be considered. If all existing factories are allowed to expand up to 800 ton crushing capacity production may increase within the next 5 years to 100,000 tons. The cane required for a factory of 800 ton capacity is 100,000 tons and the acreage required will be about 5,000. There is a shortage of cane in Mangalore. It is all wrong to compare factory outturn in the Province with those of other Provinces. The important factor is the tonnage of sugar obtained per acre.

There is in Coimbatore the Agricultural Sugarcane Breeding Station, which produces new varieties each year which are sent to the Madras Government, who recommend varieties to sugar factories. The Government should sponsor small farms by the side of each factory and these farms can be run by Government if they wish but to produce better results should be run by the factories themselves in conjunction with Government and they should experiment with different varieties.

Power alcohol.—It does not appear worth while having power alcohol plants except in the cases of factories of 800 tons crushing capacity.

Certain factories are in a financial position to put up their own power alcohol plants and any factory which applies for permission to do so should be allowed to do so. Government, however, have not yet announced their policy and whether the same Excise Duty as paid on petrol, will have to be paid on power alcohol also.

Very few factories, I think, will put up a power alcohol plant costing not less than about Rs. 7½ lakhs and they will only do this if Government announce their policy regarding prices and Excise Duty and also give some undertaking to the factory that they will take their production of power alcohol for a fixed number of years. The Government should offer to take the full production of a factory at a fixed price plus a fixed profit of say 10 per cent. Six or seven factories will take up this work. It is worth while for the Government to give facilities for the manufacture of power alcohol, especailly when the demand for petrol is considerable.

12. *Mr. R. K. Gajapati Raju, B.A., B.L., Managing Director of the Andhra Cement Co., Ltd., Bezwada.*—From the very meagre information available from the ancient Geological reports of the Government of India nobody can say with any degree of certainty about the quality and the quantity of the raw materials available in this Province. Excepting Kaolin all the other raw materials needed for the manufacture of porcelainware are found in abundance in very many districts of Madras. The other raw materials for instance like Felspar and the Quartz are found in abundance and also of good quality in very many districts and this offers no handicap at all.

There are clays in good quantity and also quality for the manufacture of electrical insulators, and glazed jars, etc. This industry can be attempted in the districts of Vizagapatam, Godavari East and West, Nellore, Cuddapah, Kurnool, Salem, Coimbatore, Mangalore and Tinnevelly. There are plastic clays available in every district and the same is useful for any kind of brick manufacture. The seasoned clays of Malabar and the West Coast are admirably suited for the special types of roofing, ceiling and the flooring tiles burnt in the scientific kilns called the continuous ones. If the same industry is to be successfully carried on, seasoned clays out of the abandoned tank-beds are to be selected in other districts.

The various processes of porcelain manufacture should be divided. The mining and dressing processes should be done by the Government and the clays to be distributed to the various co-operative societies for manufacturing the cups, saucers, dinner sets, tableware and toys by hand at contract rates. The hand-made goods can be collected and burnt by the experts at the central places where the Government locate oil furnaces for the purpose.

All coal furnaces are found uneconomic and inefficient even in countries like England and they are replaced by oil furnaces at present. An oil furnace with all the modern devices and equipment for a fairly good production would cost not less than 4 to 5 lakhs of rupees. The equipment must be imported from foreign countries.

The Government did not come forward with any help to our industry. We are short of building materials and other materials for manufacturing frames, racks, etc. Secondly the difficulty of getting fuel.

Government should take immediate steps for a detailed geological survey of our province. The Government should appoint three or four batches on the regional basis, so that simultaneously and expeditiously investigations can be finished and the whole province gets the advantage. Each regional party should consist of not only geologists but also experienced industrial chemists so that the occurrences, the quality and the quantities of the mineral resources may be noted and reported.

13. *Sri M. Bapineedu, M.L.A., Ellore, West Godavari district*: Our Madras Industries Association has got branches in 13 centres. This gives all information about the cottage industries, minerals large scale industries, forests and their uses.

The industrial museums and organizations which are already well established should be utilized for dissemination of industrial knowledge both as regards large scale and cottage industries. The District Collector is ex-officio Chairman of the District Committees and the District Industries Officer is the Secretary; and then the local people and some of the non-officials are also members. In our central Industrial Museum we have got information about all the large-scale industries and about the raw materials, mineral resources, etc. In the districts, in the same way, we have got museums. The main object of the Madras Industries Association is not only to show the localities, but also to furnish information about the produce, commercial information, agricultural information, etc., in addition to industrial information. We have also got a free-reading room attached to each museum. So we have got all these things and those who visit the museums will understand clearly the resources as well as the industrial output of the district. In that way we want to make people industrial minded an Buy-Indian-Minded.

The Department of Industries is not able to give any information regarding new industries started in districts. They are unable to give information regarding exports and imports which is necessary in order to decide what industries should be started in the country. Department of Industries should organize information bureaus. The industries that are already started must be stabilized. In Travellers' Bungalows too we can exhibit the goods that are produced in the particular district so that the people that lodge there can have some knowledge of the productions of the district. They can see at a glance the importance of the district in the field of industrial development.

Another thing is, decentralization of heavy-key industries should be eliminated.

14. *Sri E. G. Vaidyanathan, Cosmos Traders, Nos. 3 and 4, Kondi Chetty Street, Georgetown, Madras—Paragraph 1 of the Report*: I feel that the terms of reference drawn up are totally inadequate for any committee to make a report which will have some practical value apart from theorising. Our libraries are full of theoretical facts, figures and ideas and are not in need of further supplements. My complaint is that the terms of reference are not designed to produce a practical plan or blue print of over all industrialization of the province but are merely designed to add further to the literature on similar subjects.

I am of opinion that there can be no such thing as an isolated *industrial planning* apart from agricultural, and educational planning. Planning should be for general life and industry has the place of the most important factor in the general life of the province. To be more concrete I hold the view that the Industrial Planning involves particularly in this province the need for reorientation in our agricultural methods as also in our methods of educating our youngsters. If we plan for industrial development and carry out the plan without simultaneously attending to necessary changes on the educational and agricultural fronts our efforts are likely to prove lopsided.

Therefore while appreciating the terms of reference already drawn up I would recommend additional references on the following lines for investigation :—

(1) To advise ways and means of training our youngmen and women to take to industrial careers suited for employment in the particular industries which will be developed in this province;

(2) To suggest changes which have necessarily to be introduced in the Province's agricultural methods in order to ensure rapid industrialization;

(3) To investigate the postwar dangers as well as potentialities of world market for the products of the industries of this province and to suggest ways and means of ensuring them especially in view of the threats of the British Government to develop elsewhere all the raw materials for industry now produced in this province;

(4) To enquire into the methods of financing of the banks in this Presidency and to devise ways and means of making the banks finance industry on a larger scale ; to advise whether abolition of branch banking as a remedial measure towards this end will be the proper measure or to recommend other methods which will have the effect of diverting banks into financing real industrial enterprise instead of carrying on the mere traditional money-lending business to the directors and their henchmen ;

In addition to attending to the above, I suggest that the Committee should concern itself with the direct question " whether we are going to plan our industries round the village or whether we are going to plan them around cities." This question is very vital to the industrial as well as economic future of the country. In spite of all idealism, none in India can deny that there is urgent need to relieve the pressure on the land somehow. The only concrete way in which this can be done is to plan a number of cities around which industries have to be located. My own opinion is in favour of creating a hundred cities of medium size capable of drawing up to 200,000 people so that approximately twenty millions more can be drawn into industrial life, leaving about twenty in the villages. I am also of opinion that a concrete and positive attempt at urbanizing the village life is likely to add to the industrial activity of the Province and raise the standard of income of the people. For fear of taking considerable space, I am leaving the question at this stage after just suggesting that the Committee have to concern themselves with the question along with its concomitants of transport, markets, town-planning, etc.

Another question of importance in this connexion is the need to explore the possibilities of employment in the Province as it proceeds to get industrialized according to the plans which may be drawn up and to suggest methods by which wasteful and unremunerative employment can be avoided as well as to suggest ways of providing useful and full employment to all the people in the Province.

Paragraph 2.—I am in agreement with the views expressed.

Paragraph 3.—There can be no doubt that this country is rapidly moving towards establishing a socialist democracy though there are forces acting in other directions. Therefore, I suggest that the Committee need not any more be under any doubts on this score and can proceed on the assumption that the industrialization plan to be drawn up should be such as to be in conformity with the ideals of a social democracy of course with an eye to practical training possibilities. Again regarding the question of sharing powers, I am of opinion that there is no need to postpone consideration of plans on account of the lack of precise knowledge as to the possible future allocation of subjects between Province and Centre. I understand that the draft constitution is ready and must be available to the members of the Constituent Assembly. The chances of drastic changes in this are few and far between. Further, there will be no harm in preparing a plan for this Province on the assumption of absence of conflict with the Centre or other provinces. If such conflicts arise, there is nothing to prevent adjustments between Centre and Province to enable fulfilment of the plan or alternatively to suitably modify the plan at the same time securing the ultimate object which lies behind it. Industrialization of the Province is not an end itself; but is only part of the larger end of securing for every man a minimum standard of living.

Paragraph 8.—In this paragraph, the Committee have tried to define the scope for industrial planning in the Presidency. In attempting to do so, it has drawn upon the analogy of the Bombay plan as also the various plans of the Government of India. These plans were evolved when the war was on and therefore suffered from a certain amount of vagueness about the future. Any attempt at trying to draw upon the inspiration of these plans will result in vagueness. For instance, to state that the objective for planning is " to raise the standard of living of the people " is too vague an objective to be scientific. I would prefer the objective to be more definite and to be some such thing as below :—

" To suggest ways and means of harnessing and utilizing the resources of the Province such that every person in the Province is provided with the following minimum standard of living conditions : (1) 2,000 cubic feet of living space per head in healthy conditions, (2) 50 square yards of clothing and (3) 2,500 calories of optimum quality food ; these conditions to be achieved in the course of five years, say within 1954."

In the light of the above, I would rather redefine planning as the establishment of conditions necessary to effect the above changes. Of necessity, such planning will have to deal not only with the production side but also with the distribution side.

I am with your Committee when stating that "The concentration of economic power along with political power in the hands of ruling politicians, etc., magnitude." This is more so from the course provincial politics have taken in this Presidency. Having conceded the proposition, your Committee will have to consider the machinery by which such a danger can be avoided. What is that machinery which will achieve the planning for the benefit of the people as a whole and which at the same time will not be affected by party politics ?

There is no doubt that the State should have some powers such as licensing, marking, ensuring quality, etc., as you have stated. This is not an ideal but because in this country the State is the only entity which can ensure some sort of congruity in industrial development.

You have stated in the same paragraph that distribution of industrial production should be left entirely to private hands. I like to refer the Committee to that now world famous book "THE MANAGERIAL REVOLUTION" wherein the dangers of entrusting the means of production and the means of distribution to one and the same hands have been very well brought out. If production is to be entirely in the hands of private enterprise subject of course to some Government regulation and distribution is also to remain in the same hands, it may not be politicians but some others who may be dictating the economic conditions here. It is a well-known fact that owing to world conditions, the actual hold which the capitalist has on industry is fastly becoming theoretical. Things are rapidly passing into the hands of the executive and executive controlling both production and distribution is likely to prove the greatest stumbling block in further progress. The experience of France following the French Revolution will prove of immense guidance in the matter. The French revolution created the French farmers in places where the feudal lords stood and these people have become so conservative that they have effectively prevented all progress in France either in politics or in economics. I am only trying to draw the attention of your committee to this aspect of the matter. I have no ready solution to offer as to how best the dangers can be avoided but am of opinion that given some time your Committee will be able to arrive at some comfortable conclusion.

Paragraph 9.—I believe it is no longer necessary for the Committee to be undecided about the political ideologies which will govern this country. As stated earlier, the tendency towards democratic socialism has distinctly gained currency in all circles in the country. The Congress General Secretary has more than once emphasized it. The views of the Prime Minister of India on the subject are well known. Even the capitalist Finance Minister of the Government of India has confirmed in recent speeches (vide his address to the Chambers of Commerce at Madras immediately on his appointment) that the era of competitive economy is dead and that of controlled economy is a settled fact. Dr. John Mathai again has given evidence of this tendency. Therefore I would recommend that the Committee should assume that there will be a socialist democracy established in this country in the nearest future and proceed accordingly to draw out its plans.

Paragraphs 10, 11, 12 and 13.—My views on the nature of the industries which have to be nationalized have already been set forth in my memorandum submitted to you earlier.

Paragraph 14.—I agree with you that the administrative machinery of the Government is insufficiently trained and organized to run industries. Some very high officials of the Government with whom I had an opportunity to discuss the matter agreed with the view. Further, according to Acharya Kripalini any nationalization at this stage will only strengthen the bureaucratic administration and give the latter increased powers. So far your Committee's views are the same as mine but the Committee should not stop there. It is for them to go into the matter and suggest ways of getting over the difficulty. The example of the Railways and the Posts and Telegraphs and the experience of State trading during the war are before them. The methods employed in these can be closely studied and recommendations may be made so as to evolve a new officialdom which will preserve business elasticity with Governmental stability of character. To give up all nationalization on the excuse of lack of administrative efficiency in the Government is to write off progress in the economic field for some years to come.

Paragraph 16.—I agree with the opinions of the Chairman and Dr. Naidu in respect of groups 2 and 3. Regarding defence industries I have already given my views in my memorandum. I have done the same in regard to the vague grouping under No. 4.

Regarding the complaint that some parts of the subject are included in the federal list, I suggest that your Committee may suggest modifications in the legislation in the light of their study of the subject of industrial planning. In spite

of the company law, I am of opinion that labour representatives can be brought into the directorates of companies. At least in those concerns to which the Government have contributed, they can insist on nominating ex-officio directors who may be chosen from the recognized labour leaders who I am sure will prove to be excellent watchdogs of the public interest. Apart from that, Government can make informal arrangements with industries to get labour properly represented. It is an unfortunate fact that in contemporary India both labour and proprietor are conscious of only rights to the exclusion of duties. One way of making them jointly responsible is to get both in the directorates.

I agree with your observations in paragraph 17.

My views on your paragraph 18 are that the provinces should have the initiative in the planning while the centre should function as a harmonising and co-ordinating agency also providing advice and technical help.

Paragraph 19.—I would add to the last sentence the words "and cover within the next five years the progress achieved by the western countries in the last 100 years."

Paragraph 21.—I do not expect any conflict between Delhi and Madras but definitely incline to the view that at least rubber manufacture and Vanaspathy should be left exclusively to this province for planning.

The essential raw materials are found almost exclusively in this province and there are no special factors governing these industries which warrant their location elsewhere or control by quarters other than those in this area.

Paragraph 22.—According to the Committee all private industries other than those designed definitely for nationalization should come in for provincial planning. I am of opinion that there should be planning for all industries (in fact not only for industries but as stated earlier for agriculture, education, etc.), including both the private enterprise ones and the nationalized ones. You have assumed that the nationalized ones are to be entirely under one Government of India. I do not understand why the Committee should not demand that even among the industries to be nationalized those which are of immediate importance to this province should be subject to provincial planning subject of course to the overriding recommendations of the Government of India. There can be no doubt about your view that all the industries should become subject to the Plan.

Paragraph 23.—From the newspaper reports I understand that the relation between the Centre and the Provinces and the Indian Union Government are not going to be like those of the United States of America or Australia where the units and the centre can conflict. On the other hand, the constitution proposed would appear to provide for very close ties between Centre and Provinces and therefore the fears that a uniform industrial policy for the whole of India will not be evolved if the Provinces are allowed to plan independently may be exaggerated too much. The difficulty can easily be solved if the different Provinces plan independently and allow the Centre an overriding authority to modify the plans only in case of unavoidable conflict or in case of positive harm to the overall industrialization of India as a whole. The second argument that the price level of consumer goods throughout the country can be maintained effectively only if production is subject to Central Control is not completely true. The commonsense answer is that the best course to maintain price levels uniformly is to ensure proper distribution. Distribution affects prices more than production. The classical example of Brazilian Coffee and the world restriction agreements in respect of sugar, rubber, etc., are examples in point. Though these methods aiming at restricted production did succeed to some extent in counteracting falling prices, they effectively prevented larger and cheaper distribution to the overwhelming masses. The whole question in fact directly hinges on the objective behind planning. Is it to be undertaken merely with a view to industrializing the country as an end in itself? If so, production controls will have some effect in maintaining price levels and bringing in profits. If on the other hand the objective is to provide for the people of the country larger and increased amenities, the best way to maintain prices will be to control the distribution. To argue in reply that war-time controls have failed will not be a fair appreciation of the problem. My answer is that war-time controls were entrusted to a machinery which by tradition, experience and upbringing was the least capable of handling the problem. In addition, elsewhere than in India, distribution controls did work successfully. In fact in Britain, it has even been used to build up an export market.

My contentions would therefore boil down to this: Control over the production side should not be with a view to maintaining price levels but should be towards

ensuring excellent conditions of industrialization, employment and production of quality products. For maintaining price levels, suitable mechanism should be devised on the distribution side.

Paragraph 24.—Yes. The case is for increased production. There is no danger for over production for the needs of the country if our political economy is suitably modified so as to ensure optimum standards of living for everyone in the country for a long time to come. Further, even anticipating a period of over production, it is the duty of the country to foster export trade in the products of the country's industry. The vast markets of China, Indonesia, Siam, etc., in the Far East and the Middle East are available for India. Therefore there is no danger of overproduction for several years to come and when such danger comes I am of opinion that world economic factors will readjust themselves as they have done in the past.

Paragraph 25.—I am in agreement with the statements of the Committee in this paragraph. The average province-in India-both by population-and by extent is sufficiently a big unit to aim at a self-sufficient economy.

Paragraph 26.—The observations of the Committee are quite sound.

Paragraph 27.—I agree. I even think that changes in the Government of India's policy regarding allocation of industries are called for.

Paragraph 28.—My view is that the initiative should be with Provinces while Centre should have powers of co-ordination. The functions of the two should not conflict but should complement.

Paragraph 29.—This naturally follows from the above.

Location of industries.—This question cannot be viewed as an independent factor. It is part of the larger question whether we are going to vote for a rural economy or as I have pointed out earlier whether we are going to have an urban economy. If we favour the latter as we necessarily have to, the question will be whether we are going to favour large industrial cities or medium sized cities. I am convinced that both the Socialist party and the Gandhian wing have made out a very strong case for decentralization in industry and so am against developing very large concentrations of industrial vested interests, and hence have to favour growth of medium cities which will have the effect of decentralizing industry while doing away with the rural economy in the country. Such a medium urban economy cannot be evolved without control over location of industries. Such control can best be exercised only by the Provincial Unit and not the Centre. I am one with the Committee in their view regarding Central Control of industries vis a vis the Provinces.

Paragraph 34.—There is need not only for industrial data but there is an urgent need for a general economic census in addition. The local bodies ought to play an increased role in the collection and dissemination of such data. If your proposed Bureau of information attached to the Industries department is going to be manned in the same way as the Industries department or the Agricultural or Forest department, are at present manned I am of opinion that we can as well spare ourselves the expense. I happened to be present when the representative of the Forest department, was giving evidence before your Committee and experienced a sample of the information and co-operation which could be expected from such departments. If the Committee is keen on the dissemination of useful information, I would rather suggest that such a Bureau of information may be allowed to be set up either by the Southern India Chamber of Commerce or some other non-official organization of industrialists and the Government may contribute the expenses of the Bureau. Alternatively, the Bureau may be set up as an independent organization, say, an attached office, completely free from other Government departments with the control resting in a Board of non-official industrialists, technicians, banking, financial and scientific experts. Cheap publications may be made available from the Board to all who are in need and expert advice offered to those who seek it.

Paragraphs 35 *and* 36.—My view have been given in my earlier memorandum.

Paragraph 37.—There is a case for the establishment of production boards and I endorse the remarks of the Committee.

Paragraphs 38 *to* 47 *relating to minerals.*—I am for a forward policy in respect of exploitation of the mineral wealth of the Province. Large quantities of chrome ore and mangaese ore are exported in the raw condition from the Province. Further, from the Travancore South Coast, immense quantities of monazite and ilmenite are exported in the raw condition. Private enterprise in this Province except for the attempts of Rao Bahadur B.P. Sesha Reddi in the Rayalaseema has not been pronounced. I would suggest the formation of a separate mining corporation by the

Provincial Government which will purely be a commercial department of the Madras Government, with the objective of exploiting the mineral resources of not only this Province but also of the neighbouring states of Travancore, Mysore and Hyderabad. Representation may be provided for the states in the corporation. The constitution of the corporation may be one suitable for a commerical body and not a Government department. I am of opinion that this will ensure considerable return to Government. This will not infringe on private enterprise because private enterprise seems to be completely averse to mining operations in this Province.

I visualise an iron and steel corporation which will use the iron ores of Salem-Krishnagiri area with the lignite deposits in the neighbouring areas as also the rich iron deposits occurring in the Rayalaseema area. Iron and steel have come to occupy a very vital position in the economies of nations. In the United States of America, the average production was of the average of 80 millions a year during war years whereas in India the peak production has not exceeded 1,300,000 tons. Our population is nearly thrice that of the U.S.A. and if we are to march ahead with new ship-building machine, and machine tool, construction, agricultural implements and other industries which will make life worth living for the average Indian this country has to increase its ferrous industries at least a hundred fold. Considerable quantities of manganese and chrome ore are available in South India and some quantities of tungsten can be imported from Burma to evolve an industry producing all varieties of steel here. In the interest of the industry it may become necessary to ban the export of manganese and chrome ores and also to ban the employment of high quality coal for fuel purposes. I understand that the total deposits of high quality coal useful for smelting purposes is not considerable and so there is a case for conservation of the available material. Alternative sources of power supply will have to be resorted to.

Paragraphs 47 to 53—Labour and Industry.—I have already submitted my views on work councils, sharing of profits between labour, etc., in my reply to your questionnaire.

By way of generalization I can only repeat the well-known truth to which attention for the first time was drawn by Mr. Harold Butler, the former Director of the International Labour office. The only remedy for raising the real wages of the average industrial worker is to raise the standard of living of the masses, increasing their purchasing power thus making an increased demand for more and more products of industry. A minimum wage standard of at lesat 5 rupees per day of 8 hours' work should be aimed at as the objective to be attained in the next ten years or even five years if possible. This money wage converted in terms of real wage should be such as to ensure a minimum of 2,000 cubic feet of living space, 50 yards of clothing and food of the caloric equivalent of 2,500 per day per adult. The object may be achieved in any well-known manner either by entire disbursement in money or by goods or partly by goods and partly by money.

I would make bold and suggest even at the risk of being not taken seriously that our planning should have the ideal of providing every individual in the country these minimum standards absolutely free of cost within the next 25 years or at least within 25 per cent of the average income of the individual. This can be achieved by a two-way drive. One will be by increased production and consequent lessening of cost. The second will be the simultaneous increase of money wages the latter increase to be met from larger and larger production per individual as a result of rationalization and employment of latest man power-saving devices. In the United States of America less than 20 per cent are actually employed in productive industries and nearly 50 per cent are in service industries. We can develop an extensive service industry if large surpluses of purchasing power are left in the hands of labourers after meeting basic necessities at a fraction of their wages.

Regarding labour's sharing of profits with capital in addition to my views expressed in my memorandum submitted earlier I have since come across a very desirable compromise achieved between labour and capital in the Steel Corporation of Bengal (vide speech by the Chariman, Sir Biren Mukherjee at the annual general body meeting, 1947). I understand that above a certain fixed percentage of dividend for every additional percentage of dividend paid to the shareholders the workers are to be given, the equivalent of two days pay. This is a move in the right direction. The workers will naturally be tempted to increase production and also increase the dividend so that they may get increased dividend bonuses thus linking the prosperity of the shareholder directly with that of labour instead of making them conflict.

Financing of industries.—My views have already been stated in my memorandum about the need for an industrial finance corporation. In addition I have come to the

conclusion as a result of practical experience in the export and import trade that there is urgent and immediate need for the establishment of an export trade guarantee department as practised in the United Kingdom. It is very difficult to carry on export trade and fulfil contracts in days of scarcity of shipping and universal licensing. Between the time of contracting and despatch many risks occur such as non-issue of licences cancellation of licences, stoppage of bank facilities, requisitioning of materials, sudden issue of control, etc. In the United Kingdom these risks are taken off the shoulders of the exporter or manufacturer by the E.C.G.D. of the Bank of England on payment of a small premium which is ultimately charged to the price. This facility is open not only to actual exporters in England but also to British firms having offices in London for their trade between one country and another. On account of this facility available to British firms the latter are able to maintain stability and fulfil contracts in spite of trade restrictions even in a country like India or Burma. The local firms naturally suffer on account of lack of similar facilities. There is therefore immediate need for establishing such an insurance by Government and the insurance must be made available not only to firms here but to Indian firms operating in any part of the world. Such arrangements will lead to stoppage of malpractices in licensing as genuine contracts will begin to get fulfilled and merchants will have inducement to fulfil their own contracts since they will be free of fears of non-fulfilment instead of blackmarketing their licences to Eurropean firms as most of them do at present, the European firms themselves being fortified against losses by operation of the E.C.G.D. in their London offices. I do not know whether the local offices of the European firms are conscious of these facilities but there is no doubt that their head offices are operating on this guarantee. I have dealt a bit exhaustively on this topic because I believe that our industrialization is vitally connected with our export trade not only for disposal of manufactured products but for the very necessity to procure foreign exchange to enable purchase of equipment abroad which can be done only if the export trade is developed several times its present volume. Development of packing industries, particularly in such Indian products as tea, spices, tobacco etc., will go a longway to sell them abroad particularly in dollar areas and secure valuable foreign currency.

Paragraphs 56 *to* 58.—As already stated in my memorandum I am not at all in favour of the State Aid to Industries Act. It may be scrapped. It is a relic of competitive laissez faire economy and can be dispensed with in an era of controlled economy. Your report itself shows how furitless it has proved though you have considered only one section of it instead of the whole Act. Even that consideration as shown the deficiencies of the Act.

Paragraphs 58 *to* 67.—I have suggested the need for an industrial finance corporation in my earlier memorandum and am in entire agreement with the views of your committee. I have no comments to make on the details except to suggest that the corporation should be free of all Government red-tapism. I have my own doubts about this. Recently the Government of Madras have sponsored a Co-operative housing scheme in the City of Madras, controlled, I am informed by non-officials, all eminent men. The permanent officials there have been lent by the Government. From one or two interviews I had with them in connection with supplies of timber for their requirements I found that the Secretariat atmosphere was there in an intense form. There was absolutely no business atmosphere. This is not the case with an institution like the B.O.A.C., which though sponsored by the British Government maintains the efficiency, polish, courtesy and enterprise of a private competitive business organization. Our railways and posts and telegraphs though designated commercial departments can hardly be distinguished from Government don't touchism. I would therefore request your committee to make the constitution of the proposed industrial finance corporation to be real boon to enterprising industrialists. I am positively of opinion that in the matter of personnel, etc., of such an organization merit alone should be guiding factor along with character. The administration should be far removed from Governmental types and, would suggest the complete elimination of that system of fileraj working through hierarchies of secretaries, superintendents, assistants, clerks, attenders and peons. I would suggest a senior and junior administrative division every member of which should be a self contained unit, i.e., each one in the staff should be his own typist, clerk, attender and particularly reception officer. There should be no opportunity to shift responsiblity.

One other suggestion I like to make in connection with the proposed industrial finance corporation is that in all the industries in which the corporation takes part the vicious system of managing agency with its evil of self-perpetuation should be given up. I would in this connection commend to the committee the remarks made by the eminent authorities of the All-India Manufacturers Organization in a

valuable publication brought out by the members of the A.I.M.O., who toured the Western countries headed by Sir M. Visweswarayya. In the language used in connection with the suggestion to abandon the system of managing agency one could easily see Sir M. Visweswarayya's hand and so in suggesting the discouragement of this system I claim the support of the premier industrial economist and engineer of this country and perhaps the world.

Further I am of opinion that there is great need to establish private finance corporations apart from Government sponsored ones. Our banks have failed us miserably and this is one possible remedy. I hope your committee will attend to this aspect and make suitable recommendations to make such institutions possible.

Paragraphs 68 to 73.—I would suggest that in your paragraph 70 instead of the chiefs suggested representatives of the respective departments may attend the weekly conferences so that the industries board might not assume the place of one among the many activities of the heads of departments. Therefore the better solution will be for the chiefs to appoint wholetime representatives whose main job will be to represent their respective departments in the industries board and serve as liaison officers. I am positive that an industries board with the big personalities you have named will be a failure or at any rate a delaying body and will take away very valuable time of the chiefs.

I would also take this opportunity to re-emphasize the need for creating a live-wire statistical board for giving "statistics about industry and general economic conditions and also to give warnings of world conditions to producers regarding possible price increases or decreases, deteriorations in quality, possible losses of markets, on-coming foreign competition, production gaps, possible expense-saving methods, etc."

I have already dealt with the need for planning our educational system along with the industrial system of the Province to avoid unemployment, wrong employment and wasteful employment in connection with my discussion on the terms of reference of your committee.

15. *Sri V. S. Krishnaswamy, District Forest Officer, Madura.*—He has submitted a note which is printed as Appendix XIII.

16. *Mr. W. T. Williams, Chairman, Madras Chamber of Commerce—Nationalization of industries.*—(1) Defence industries. These should be nationalized in the sense that they should be owned and controlled exclusively by the State. (2) Industries connected with generation of power: Industrial power alcohol being connected with sugar industry, included under item 4 cannot be exclusively owned and controlled by State. (3) Industries connected with transport and communications: The scope for private enterprise should not be ruled out.

Control by Centre or Province.—Provincial Government is in a much better position to plan than the Central Government as they can speed up the progress of industries and being in direct touch will know what is required and give their full concentration to the job on hand. Control should be given to the Province at least for a trial period of five or ten years.

Licensing of industries.—Regional and Provincial Advisory Boards may be constituted with a non-official majority not being nominated by Government but nominated or elected by industrial bodies. Labour institutions should not be represented on Regional Advisory Boards, but one seat may be allotted to labour in the Provincial Advisory Board. The functions of the Boards should not merely be advisory.

Control over production.—Difficult, dangerous and possibly developing to dictatorial. The constitution of a production board opens the door to discrimination.

Limitation of dividend and sharing of profits.—It would throw the share markets into chaos. It will not be fair to the investing public. Government should foster the growth of the investing public, whereas this measure would kill it.

Flourishing companies keep the share capital at a minimum and borrow at 4 per cent or under extra finance they may require. But other companies would benefit by a maximum holding of share capital. By limiting dividends the minimum share capital company will suffer badly. Such limitation would render commercial working involving any degree of risk impossible and thus retard industrialization of the Province.

Much of the capital employed in business is in the form of reserves built up by prudent management over a long period of years. An important duty of the Directors of Joint Stock Companies is to consider what proportion of the profits should be reserved for future development and what portion may be released to share holders

in the form of dividends. It is not to be expected that Government can create machinery or apply a rule which can supplant the Directors in the highly technical aspects of their duties.

If a concern is sufficiently prosperous, it is considered that the labour should benefit not in cash payments over and above ordinary wages, but in improved living conditions, improved amenities and extra provision for retirement.

If there is any restriction on the dividends and the balance of profits is to be shared as suggested in the report the industry would stagnate in consequence.

Financing of industries.—The Finance Corporation should be established on the lines of the Central Land Mortgage Bank Limited, Government taking 49 per cent of the capital, public institutions such as insurance companies, banks, etc., 25 per cent and the balance left open to private subscription. It should specialize in long-term industrial investments and should not compete with existing banks. The Government should not have a majority on the Board of Directors.

17. *Mr. C. Seshachalam of Messrs. Curzon & Co.—Sharing profits.*—Profits may be shared but not in cash to workers. A certain amount of profits should be earmarked for providing amenities to labour.

Production Boards for Industries.—Yes, labour being represented but not forming majority.

Foreigner's share in Industries should not be more than 30 per cent.

Licensing of industries may be done if it does not act as a break on starting and expansion of industries. Members on licensing boards should be elected and not nominated by Government. Nationalization should be resorted to only if private enterprise fails.

18. *Sri V. Pandurangiah, President, S.I.C.C.*—He is against profit sharing by labour which is now uneducated and irresponsible. Sufficient bonus is now paid to meet increased cost of living. Agrees to production boards.

19. *Mr. G. D. Naidu, Coimbatore.*—Central Government give licences to persons other than Madrasis. Madras Government should have power to grant all licences including import licences. Tobacco tax should not go to the Central Government.

Following industries may be started: Machine tools; automobiles; electric motor; steel rolling mills; razor blades with steel furnace.

Capital to be provided by Government, foreign concerns and private subscription in equal proportions. These industries should be left to private enterprise with Government control.

20. *Sri R. Venkataraman, M.A., B.L., Advocate.*—He has submitted a memorandum which is printed as Appendix XXI.

APPENDIX IV,

(See chapter I, paragraph 7.)

DATES OF MEETINGS HELD BY THE COMMITTEE.

The Committee held 21 meetings on the dates noted below:—

20th June, 19th July, 21st July, 22nd July, 23rd July, 6th August, 8th August, 9th August, 6th October, 7th October, 15th October, 16th October, 17th October, 20th October, 5th November and 9th December 1947, 8th January, 9th January, 20th January, 21st January and 4th February 1948.

APPENDIX V.

(*See* Chapter I, paragraph 7.)

PLACES VISITED BY THE COMMITTEE.

The Committee visited the following places:—

Mettur.—23rd to 26th August 1947.
Alwaye.—3rd and 4th November 1947.
Coimbatore.—5th November 1947.
Bangalore, Mysore and Bhadravati.—17th to 22nd November 1947.
Bezwada, Vuyyur, Masulipatam and Vizagapatam.—21st to 24th January 1948.

APPENDIX VI.

(*See* Chapter I, paragraph 4.)

SUMMARY OF COMMENTS RECEIVED ON THE PRELIMINARY REPORT.

Janab S. Nalla Mohamed, B.A., B.L., Working Secretary, The Provincial National Muslim Majlis, Madras : In general the Report is excellent and appreciable.

(1) *Nationalization.*—The essential requirements of people should not be left entirely in the hands of a few capitalists. Therefore in the case of such industries also, state-ownership should exist side by side with private ownership.

(2) *Control by Province.*—All industries except Defence and Engineering Industries may be entrusted to the Provinces.

(3) *Location of Industries.*—It is advisable to establish industries in different localities instead of locating same industries in one particular area. Then the people will not concentrate in a particular area; labour troubles can be avoided, and in the time of war, the whole industry may not fall into the enemy's hands.

(4) *Power of the Committee.*—The Government should exercise its discretion in the granting and withholding of licence.

Indian Commerce and Industries Company, Limited, Madras : The views expressed and the recommendations made in the Preliminary Report are based on practical experience and sound economic principles in the interests of further growth of industries in the Province.

Labour and wages are the crux of the problem of growing industries and stepping up production which is the greatest need of the day. Strict legislation may be introduced for higher wages and better amenities. A compulsory system of profit sharing (say 6¼ per cent) at the end of every year may be introduced.

In all industries except those reserved for the Centre, the Province should have power to issue licence, fix the size of the economic units and to settle location.

A bureau of information is the greatest need of the day. Many industries are faring badly as they are not constructed with proper advice and technical supervision and suitable machinery. Machinery is rapidly changing for increasing production and consuming less power and reducing employment of man power to its minimum. Foreign countries are dumping their old fashioned machinery into India. To refer to a particular industry, there is no one in Southern India who is competent to give guidance in the production of alloy steel and steel castings, to repair and replace the spare parts for the machineries engaged in various industries including motor cars and aeroplanes. In other countries research laboratories are attached to the industrial concerns. Proper advice as to the sources of machinery, their quality and durability is what is wanted more than finance. Technical advice may be given to those who embark on new industries.

As for industrial education a curriculum should be drafted.

The present atmosphere in the country is surcharged with emotional impulses and if this exuberance of enthusiasm is not properly controlled and guided by State action, the development of industries is not likely to proceed on healthy lines. Hence the control by Provincial Government is imperative. For instance, the rice mills in South India are equipped in a very irregular uneconomic and erratic manner and there are more mills than there is need for.

Apart from the Industrial Finance Corporation, the existing banks may be permitted to give long term industrial loans to Joint Stock Companies, etc. The loans by banks may be restricted to supply of working capital and Finance Corporation may lend for capital investments, for improvements, extensions, etc.

Mr. V. Pappu, B.E., A.M. I.E.E., Madras : Location of an industry could be decided on the following technical and commercial aspects :—

(1) Cost of transport of the raw material to the factory site.

(2) Cost of transport of finished products from factory site to marketing centre.

(3) The availability of cheap power and labour, and the influence of the factory owners on the populace both at the raw material centre and the factory site.

A Central organization both at the Centre and the Provinces will be essential for advising on the location of factories. It would be beyond the financial capacity of an industrial entrepreneur to obtain all the data and the expert advice that a Central Government Organization could command.

Messrs. Seshasayee Brothers, Ltd., Trichinopoly : *Nationalization.*—The circumstances prevailing in our country do not warrant a fixation of artificial limits either to nationalization or to the field open for private enterprise. The proper ideal would be a gradual attempt at nationalization in consonance with progress of ideas without, however, stifling private initiative where it has proved itself superior to Government management.

The Committee's views that all industries other than those recommended for nationalization should be subject to planning by the Province retaining effective control over production and location, and that the Provincial Governments should be entrusted with the responsibility for industrialization and industrial planning are too sweeping in their nature.

The analogy drawn from the west to prove that with the development of transport, the nearness to the source of raw materials is not of much importance in deciding the location of any particular industry, is not very helpful in consideration of the conditions obtaining in this country. Nor can our municipalities and panchayats prepare handbooks regarding the potentialities of industry within their areas.

The recommendation for setting up of six Regional Advisory Boards and of Provincial Advisory Board will be welcomed, but how far they will speed up industrialization remains to be seen.

The institution of Production Boards may be done, but only under expert guidance.

Development of Mineral Resources.—It is a question to be considered whether all essential minerals should, as suggested, be nationalized.

Problem of wages.—The aim to maintain for the workers a standard of living consistent with national economy would be accepted by many, but there should be realization of the need for sanity in wage demands and of the fact that an increase in the price of common goods will hit the poor most of all.

The recommendation to set up an autonomous Industrial Finance Corporation is one of the most important recommendations and if properly managed the Corporation should make for rapid industrialization of the Province.

Sri D. S. Sastry, B.Sc., A.I.I. Sc., Aravankadu, Nilgiris : *Planning.*—In this country the consumption of goods of any nature per capita is very much below the corresponding figures for any other country. Provided the prices of materials are kept such that they are accessible to the average man, the consumption and consequently production of goods will be continually increasing. So the real problem is not control over production but to produce plenty at a cheap rate in an organized manner without dumping the market with a few articles to the entire absence or shortage of other things. The location of industries must also be done with the same objective. To meet this objective distribution must be organized avoiding intermediaries and middle men.

Nationalization.—To the classification of industries made for the purpose of nationalization a few alterations are desirable. To defence may be added some connected industries. Fuel must be added to Class 2, industries connected with generation of power. Thus nationalization of these industries is essential both in their interests and in the interests of those industries which they serve.

The argument that the Government Departments are not properly organized to undertake management of industries requiring greater degree of technical skill and managerial ability and therefore should be left to private enterprise does not hold water. It is quite feasible to organize a new Department with the right type of people to plan, supervise and operate the industries of Government. Large numbers of technically qualified and experienced people who are being discharged since the end of the war may be utilised. As regards managerial ability Indians had so far only limited opportunities. If opportunities are given many Indians can be selected who will be quite suitable.

All industries coming in categories 1 to 3 and those as are considered necessary in category 4 must be nationalized for the following reasons :—

(1) Industries requiring large capital if left to private enterprise will lead to capitalist combines. To purchase them back, the State will have to pay many times their actual initial investment, e.g. ; M.E.S.C.

(2) By stopping the profit motive, the State will be able to produce cheaply, the important point being selection of economic units.

(3) State managed services will be always more efficient.

(4) Private enterprise will lead to exploitation by the misuse of privileged position, leaving aside irresponsible exercise of power and influence in the political sphere.

Location.—The State can guide in location of industries as the State can utilize all its resources and ensure that all parties are equally benefited. Availability of raw materials and certain auxiliary services are of specific importance in the location of certain industries. e.g., it will be disastrous to transport sugarcane any long distance to a sugar factory.

Industrial Information Bureau.—In addition to industrial information bureau and advisory boards of industries, we require immediately technical research laboratories. This cannot be left to the industries themselves as they cannot afford it and they lack the foresight and appreciation of their own future interests.

Development of mineral resources.—Sulphur and sulphuric acid are widely used in industry and should therefore be controlled from the Centre.

The problem of wages.—The workers have nothing to fall back during periods of unemployment, or after retirement or incapacity to work. This may be covered by unemployment insurance schemes, etc., but systematic provision from the earnings will be a healthier practice.

The worker should be provided with his requirements at standard prices, the difference between standard prices and ruling prices in the market being met by the State and industries concerned. Provision of amenities such as medical relief, housing, insurance and education is better than profit sharing which tends to create ill-will and inefficiency.

A certain number of shares of the Industrial Finance Corporation must be set aside to be allotted to workmen in some acceptable proportion and in compensation of their good services. The dividends on these shares will take the place of profit sharing.

Industrial training.—Short-term courses for training technicians and managers must be instituted. People locked up in industries should be admitted to this course. Scheme of apprenticeship must be rigorous. It is not desirable to train a large body of our young men in foreign factories except to obtain the process technology.

Bh. Venkataratnam, M.A., M.Litt., Madras : Scope of Industrial planning.—The responsibility for economic development should rest mainly on the Central Government and the Provincial Governments should act in consonance with the wishes of the planning authorities for an optimum utilization of the resources of the provinces concerned.

Nationalization of industries.—Category (i) (Defence Industries) should include vital industries like iron, steel, coal mining, heavy chemicals, etc., and should be nationalized under the auspices of the Central Government. (ii) Thermal stations providing electricity to the towns should be municipalized. On the other hand hydro-electric schemes and the industries coming under category (iii) may be nationalized under provincial aegis. As regards industries coming under category (iv) the State's role should be regulation in character rather than taking initiative. The responsibility to provide full information regarding the capital requirements both initial and working on the basis of an optimum unit and also provide the necessary information regarding location, etc., should be with the Government.

The Planning Committee should consider the problem of starting of industries by private capitalists with defective managerial skill and see how far Government help can be rendered to industries coming under category (iv).

Information bureau.—The Provincial Advisory Board should be attached to the Provincial Bureau of Economics which will be headed by the Economic Adviser. The Advisory Board should be drawn from specialists from the different fields to advise the Economic Adviser.

Industrial Finance Corporation.—How far such a Corporation will succeed is a problem which cannot be tackled on the present information. What should be the basis for State-aid and should such corporation give loans at advantageous terms to entrepreneurs to start industries, and if so, how long such advantageous terms should be continued, etc., are problems to be decided. This problem of finance requires more thorough study.

General remarks.—The Committee omitted to consider the problem of dovetailing the development of small scale and cottage industries with the development of large scale industries.

The report is likely to be of limited value as it is done in an isolated atmosphere and not as a detailed report of the problem which is part of a comprehensive problem.

"*The Mail*", *Madras*: Agrees with the views of the Industrial Planning Committee that planning by Provincial Government should not be unduly controlled by the Centre.

"*The Hindu*", *Madras*: It is doubtful whether the Committee's conclusions about nationalization are final. Modern conditions have rendered inevitable a greater or less degree of State control over the whole field of industry. State ownership and nationalization represent only an extreme form of State intervention. What role the State should play in any particular case should be decided solely by the circumstances of the industry or service concerned and by the only consideration whether the State, by taking over the management and control, can do the job more efficiently and cheaply than private enterprise. In this view, it does not appear right to treat transport, for instance, as an industry that must here and now be scheduled for nationalization. If the Government desire to enter this field to improve the service, they could do so without setting up a monopoly of their own and excluding completely private enterprise. There is also the danger of the Government biting more than they can chew. To proceed with schemes for the nationalization of industries when the administrative services are hardly able to cope efficiently with their normal functions would be extremely ill-advised.

There does not seem to be much justification for the fears which the Committee entertains about planning by Centre. It is inconceivable that any central planning authority will ride rough-shod over provincial interests and, under the new system, a respectful hearing to every province's point of view is assured. In view of the intimate bearing which central policies regarding railways, tariffs and currency, finance have on industrial development, there will have to be co-ordination, co-operation and assistance from the Centre if the provinces are to carry out their programmes for industrial development. The Planning Committee is, however, right in urging that the multiplicity of controlling authorities to whom at present industrialists have to go for sanction at every stage is a serious handicap. The Planning Committee's suggestions to limit the sanctioning authority to one, namely, the proposed Board of Industries, would considerably simplify the industrialist's problem, but the arrangement can work satisfactorily only if the Board can secure the co-operation of the Centre.

The Planning Committee is inclined to regard the problem of planned development as mainly one of proper licensing of industries, except in those cases where the State itself is to run the industries. The Committee states that planning should be confined to control over production and location of industries. This appears to proceed from a narrow conception of planning. If planning is conceived as the organization of the resources of the community in men and materials for the realization of definite social objectives, the State's role in such planning cannot be defined in mere negative terms. The problem is not simply one of approving or not approving the starting of particular industries, or of extending such financial aid as the approved undertakings may need, but the wider one of developing positive programmes for the maximum utilization of the country's available resources and manpower. This suggests the need for drawing up targets for various industries—cloth, housing, etc.,—to be realized over a period of years. The aim of planned development must be to relate resources to needs in such a way that the community is ensured the highest attainable standard of living. We hope the Planning Committee will address itself to this problem before it submits its final report.

"*Indian Express*," *Madras* approves Committee's suggestions regarding regulation of industries by the Province, the respective fields of nationalization and private enterprise, legislation by Provinces to regulate the incorporation, operation, etc., of companies, constitution of Provincial and Regional Boards. Does not favour district boards and panchayats collecting statistics. It can better be done by competent and well constituted committees preferably under the direction of an industrial engineer of high reputation. Improvement of labour conditions, work councils and profit sharing methods, autonomous Industrial Finance Corporation are all approved.

"*Eastern Economist*": Planning does not mean simply controlling industries and arranging for capital but should guide in mobilizing the resources of the community for maximum benefit of people. Even industries such as steel, cement, textiles, sugar, heavy chemicals, fertilizers, electrical machinery and agricultural implements, generation of power, transport and communications should be open to private enterprise.

Isolated Provincial Planning is not favoured. Co-ordination and assistance from Centre necessary.

Suggestions regarding Bureau of Information, Provincial and Regional Boards, Industrial Finance Corporation, Licensing and Standardization of manufactured products are agreed to. Present difficulties of private entrepreneurs which now exist under the system of control should be removed.

APPENDIX VII

(*See* Chapter II Paragaraph 26)

LIST OF INDUSTRIAL PANELS CONSTITUTED BY THE GOVERNMENT OF INDIA.

1 Iron and steel (major).
2 Non-ferrous metal industries.
3 Electrical machinery and equipment.
4 Industrial plant and machinery (Heavy).
5 Prime movers.
6 Paints and varnishes.
7 Refractories and ceramics.
8 Glass.
9 Heavy chemicals and electro-chemical industries.
10 Fine chemicals including drugs and pharmaceuticals (light).
11 Oils and soaps.
12 Leather and leather goods.
13 Paper, pulp, wood pulp, chemical cotton, strawboard, etc.
14 Sugar, alcohol and food yeast.
15 Rayon and artficial silk.
16 Wool.
17 Coir, rope and cordage.
18 Hosiery.
19 Silk.
20 Automobiles and tractors.
21 Machine tools.
22 Plastics and celluloids.
23 Ready-made clothing.
24 Iron and steel (minor).
25 Ship-building and marine engineering.
26 Light engineering industries.
27 Cinema industry.
28 Scientific instruments.

APPENDIX VIII

(*See* Chapter II Paragaraph 18)

A NOTE ON THE MANAGEMENT OF THE GOVERNMEMENT AIDED INDUSTRIAL CONCERNS IN THE MYSORE STATE.

There are, at present, 19 industrial concerns (1 private limited and 18 joint stock companies) in the State towards the share capitals of which the Government have contributed. A list of the concerns with the following particulars, is appended to this note :—

(1) Name of the institution,
(2) paid-up capital,
(3) share capital found by Government,
(4) total number of Directors on its Board,
(5) number of Directors nominated by Government and
(6) honorarium paid to the Chairman and/or the Managing Director of the Company for being in charge of the administration of the company.

The Hindustan Aircraft, Limited, is a private limited company in which the Government of India and the Government of Mysore are the only share holders holding shares in the proportion of 2 : 1. Its general administration is vested in a Board consisting of three Directors—one representing the Government of India, one representing the Government of Mysore and one representing Indian Industrialists.

The administration of a Joint Stock Company is vested in a Board of Directors consisting of Directors elected by the shareholders at a general meeting and a few nominated by Government, and is carried on according to its Articles of Association and Memorandum of Association.

The nominees of the Government will hold their office till they are changed. Except in the case of the Bangalore Woollen, Cotton and Silk Mills Company, Ltd., one of the nominees of Government on the Directorate of a Company, will hold office as Chairman and/or Managing Director of the concern. The election of the Chairman and/or the Managing Director is subject to the confirmation of Government. The Chairman and/or the Managing Director will be assisted by a Secretary and/or a General Manager. For the latter two appointments also approval of Government has to be obtained by some concerns.

The day-to-day administration of a concern is under the control of the Chairman and/or the Managing Director, except in the Mysore Stoneware Pipes and Potteries, Limitied, The Mysore Waterproofs, Ltd., and the Mysore Kirloskar, Ltd., which are worked under the Managing Agency System. The Chairman and the other Directors who are nominees of Government on the Board of a concern are expected to keep the Government informed of all important matters concerning the institution in which they hold offices and act up according to their (Government) instructions.

The honoraria and the sitting fees payable on behalf of officers of Government for attending the meetings of the Board, according to the Articles of Association of a Company, are credited to Government. The non-officials who are Government nominees and who exercise the functions of the Chairman and/or Managing Director, will draw, their honoraria, sitting fees and travelling allowance for attending the Board meetings directly from the companies concerned.

The Government have reserved the right to get the accounts of the aided companies inspected by their own officers and at their cost, except in the following institutions :—

(1) The Mysore Stoneware Pipes and Potteries, Ltd.,
(2) The Bangalore Woollen, Cotton and Silk Mills Company, Ltd..
(3) The Hindustan Aircraft, Ltd., and
(4) The Mysore Waterproofs, Ltd.

In their order No. D. 3509-80/I & C. 234-44-26, dated the 8th November 1945, Government have made the following observations for the guidance of the Directors on the Board of Management of Industrial Concerns, who are also on the Board of Directors in the aided concerns :—

" At present, the Directors on this Board (the Board of Management of Industrial concerns) hold the office of the Chairman or Managing Director or a Director, in a Government aided joint stock concern. Any problem common to such concern and the Government concerns may be brought up at the Board meetings for an informal exchange of views. Questions relating to joint stock companies on which Government hold shares may be referred to the Board if their advice is required. With the previous approval of Government, the Board may also inspect the factories of such companies whenever necessary, and give their advice for improvement of the same. The Board will also watch the progress of research schemes entrusted to these concerns."

APPENDIX IX.

(*See* Chapter III paragaph 33)

LIST OF INDUSTRIES SANCTIONED OR WHICH ARE UNDER CONTEMPLATION.

Name of the firm.	Location of factory.	Capacity.
	Vegetable Ghee Industry.	
1 The Vizagapatam Vegetable Oil Products, Ltd.	Seethanagaram, Vizagapatam District.	20 tons per day.
2 The Madras Vanaspathi, Limited.	Villupuram, South Arcot District.	Do.
3 M/s Sundaram Oil Mills, Ltd.	Katpadi, North Arcot district.	Do.
4 Bharat Vanaspathi Manufacturing Company.	Tadepalli, Guntur district.	10 tons per day.

Vegetable Ghee Industry.

	Name of the firm.	Location of factory.	Capacity..
*5	M/s Karnataka Vegetable Oils and Refineries, Ltd.	Hospet, Bellary district ..	10 tons per day.
6	The Vegetols, Ltd.	Chittoor	Do.
*7	M/s The East Asiatic Company, Ltd.	Madras	Do.
*8	Thungabhadra Hydrogenation factory.	Kurnool	9,000 tons per annum.
		Cement.	
9	The India Cements, Ltd. ..	Thalaiyuthu	100,000 tons per annum.
*10	Rayalaseema Cement Co. Ltd.	Kurnool	Do.
11	South India Cement Co. Ltd.	South Arcot	50,000 tons per annum.
		Textiles.	
12	The Rayalaseema Mills ..	Adoni, Bellary district ..	12,000 spindles.
13*	The Kamalapuram Spinning and Weaving Mills, Ltd.	Kamalapuram, Cuddapah district.	Do.
14	The Karnataka Spinning and Weaving Mills, Ltd.	Bellary	17,000 spindles.
15	The Rayalaseema Textiles Ltd.	Tadpatri, Anantapur district.	12,000 spindles.
*16	The Anantapur Spinning and Weaving Mills, Ltd.	Penukonda, Anantapur district.	7,700 spindles.
*17	The Tungabhadra Textiles, Ltd.	Nandyal, Kurnool district.	12,000 spindles.
18	The Tuticorin Spinning and Weaving Mills, Ltd.	Tuticorin, Tinnevelly district.	Do.
19	The Kartikeyan Mills, Ltd. ..	Viravanallur, Tinnevelly district.	Do.
20	The Ganapathy Mills, Ltd. ..	Chatram Pudukulam, Tinnevelly district.	Do.
21	The South India Textiles, Ltd.	Virudhunagar, Ramnad district.	18,000 spindles.
22	The Ramabhadra Textiles, Ltd.	Near Rajahmundry, East Godavari.	Do.
23	The Krishna Textiles, Ltd. ..	Near Bezwada, Kistna district.	12,000 spindles.
24	The Srinivas Mills, Ltd. ..	Thiruparankundram Road, Madura district.	Do.
*25	The Rajeswari Mills, Ltd. ..	Gudiyattam, North Arcot district.	6,000 spindles.
26	The Cannanore Spinning and Weaving Mills, Ltd.	Cannanore, Malabar district.	12,000 spindles.
27	The Murugananda Mills, Ltd.	Pettai, Tinnevelly district.	Do.
28	The Kandan Textiles, Ltd. ..	Near Madras City ..	6,000 spindles.
29	The Kannabiran Mills, Ltd. ..	Coimbatore	7,000 spindles.
30	The Ramakrishna Mills, Ltd.	Ganapathy village, Coimbatore district.	6,000 spindles.
31	The Kadiri Mills, Ltd. ..	Singanallur, Coimbatore district.	13,500 spindles.
32	The Haemalatha Textiles, Ltd.	Any place in Guntur district.	12,000 spindles.
33	The Aaron Spinning and Weaving Mills, Ltd.	Pappinnisseri, Malabar district.	Do.
		Paper.	
34.	Papanasam Paper Mills ..	Papanasam	6,000 tons per annum.
35	Godavari Paper Mills ..	East and West Godavari.	8,000 tons per annum.
36	Venkateswara Paper and Straw Board Mills.	Tirupathi or Kurnool ..	6 tons board per day and 10 tons of paper per day.

	Name of the firm.	Location of factory.	Capacity.
	Heavy Chemicals.		
37	Southern Chemicals, Ltd. ..	Tinnevelly	.. Caustic soda. 3,000 tons per annum.
38	The Link Chemicals, Ltd. ..	Do.	.. Soda ash. 30,000 tons per annum.
39	Heavy Chemicals, Ltd. ..	Do.	.. Caustic soda. 4,500 tons per annum.
40	South India Chemical and Alkali Corporation, Ltd.	Ramnad/Madura ..	.. Soda ash. 30,000 tons—40,000 per annum.
41	National Chemicals, Ltd. ..	Guntur	.. Soda ash. 30,000 tons per annum.
42	The Indian Chemicals, Ltd. ..	Vizagapatam ..	.. Caustic soda. 1,500 tons per annum.
43	Sri Rama Chemicals, Ltd. ..	Nellore	.. Sulphuric acid 80 tons per day.
		Fertilizers.	
44	Manufacture of fused phosphates.	Trichinopoly ..	.. 9,000 tons per annum.

APPENDIX X.

(*See* Chapter III, paragaph 39.)

NOTE ON POWER DEVELOPMENT IN MADRAS BY THE CHIEF ENGINEER FOR ELECTRICITY.

This note is to give an idea of the natural resources of this Province as regards power, of the progress made so far in developing these resources and of the plans envisaged for the immediate future.

Power Resources.

2. (*a*) *Coal.*—No important coal deposits had been located in this Province until recently. Some lignite fields have now been discovered in the South Arcot district and about three hundred million tons are said to be available for exploitation. Investigation is proceeding. If the deposit could be mined economically it would be of very great importance to industries as well as to power development in the Province.

(*b*) *Oil.*—No oil has so far been located in this Province.

(*c*) *Water.*—There are a good number of water power sites in the Western Ghats and a few in the Eastern Ghats. Systematic survey of the sites began in 1919; 75 sites have been examined more or less in detail; of these 17 are now considered worth development in the near future. It is likely that further detailed investigation would locate more sites; also sites which had so far been thought uneconomical may prove worth development later when need for power becomes more insistent.

3. A tentative estimate for the primary power in the Province at 60 per cent load factor would be 400,000 K.W., and of the secondary or seasonal power 300,000 K.W. The aforesaid secondary power could be converted to primary power by the addition of thermal auxiliary plant.

4. There is not a large amount of power and it has to be recognized that Madras is among the poorer Provinces of India as regards water power wealth. Punjab, Bengal and Bombay are of about 8 times more wealthy. There is urgent need for a more intensive survey of the potential water power sites and collection of hydrometric data than has been possible so far, so that all possible sites can be brought to use. A special officer is now working on this subject.

Power Development.

5. Progress in power development so far made will now be detailed.

6. Only a fifth of the available primary water power has been brought to use. Three hydro-electric installations are now working.

Installation.	Installed capacity (including spares).	Power generated in 1946-47.
Pykara	43,000 K.W.	145 million units.
Mettur	40,000 K.W.	96 do.
Papanasam	21,000 K.W.	57 do.

7. The Government have also installed two thermal plants run on coal at Bezwada and Vizagapatam and acquired the oil engine station at Cocanada. The total installed capacity of these is 10,500 K.W. and the output for 1946–47 was 20 million units.

8. The total installed capacity of power plant in the Province is over 160,000 K.W.

The following figures for 1946–47 give an idea of the total power generated in the Province and the share of it done under Government management :—

Power stations.	Number.	Energy generated K. W. H. in millions.	Percentage.
Government—			
Hydro	3	297·86	72·85
Thermal	4	19·79	4·85
Sub-total ..	7	317·65	77·70
Licensees—			
Madras Electric Supply Corporation.	1	82·26	20·15
Others	18	8·77	2·18
Sub-total ..	19	91·03	22 33
Total ..	26	408·68	

9. It will be seen that the Government Electricity Department generates 77 per cent of electric power produced in this Province. The figures will increase to 98 per cent when the Madras Electric Supply Corporation is acquired this month.

10. *Electric Power Grid.*—Since the inception of this department the objective of forming a network of power houses and transmission lines covering the Province had been kept in mind and plans for such a grid had been prepared and were periodically being revised and brought up to date.

11. The latest grid map is attached herewith. It indicates what has been done so far and what is being planned for the future.

The grid at present consists broadly of—

(1) the hydro-portion covering the southern parts of the Province and fed by the interconnected power houses at Pykara, Mettur and Papanasam ;

(2) the thermal portion covering the areas fed by the power houses at Vizagapatam, Cocanada and Bezwada which however are not interconnected ; and

(3) a portion planned to cover the Ceded Districts.

The grid is therefore in patches with many intervening gaps. The expansion programme sketched below aims firstly in increasing the number of power houses and their capacity and secondly in extending the transmission lines network to cover wider areas. As it is the grid has over 3,400 miles of high tension lines and 2,000 miles of low tension lines.

Among the major industries which are fed from the grid are—

Textiles.
Cement.
Chemicals.
Steel rolling.
Railway workshops.
Ship building.
Tea curing.

12. Consumption of power in the Province, classified according to the use made of it, is as shown below :—

	PER CENT.
Industries	65
Agriculture	8
Domestic and public lighting.	19
Miscellaneous	8
	100

13. Seventy-eight municipal towns in the Province have been electrified and about 1,100 villages receive electricity, principally used for working irrigation pumps which number over 7,000. There are also over 900 rural industries worked by electricity most of them serving to process the agricultural raw produce as in ginning cotton, hulling rice, milling corn, decorticating nuts, crushing sugarcane, etc.

Development programme for the immediate future.

14. A five-year plan of expansion of the grid has been approved by Government. It comprises the following schemes costing in all over Rs. 15 crores. Sanction has been accorded to all of them except one (Nellore) and work is in progress.

15. *Machkund Hydro-Electric Schemes.*—This scheme is for an initial installation of 52,000 K.W. to serve the Vizagapatam and Godavari districts. The scheme is to be worked jointly with the Orissa Government, Madras getting 70 per cent of the output pending completion of the scheme in 1951, the steam plants at Bezwada and Vizagapatam are to be immediately increased in capacity by 9,000 K.W. Work is in progress.

16. *Nellore Thermal Station.*—This would have installed capacity of 5,000 K.W. and would serve the Nellore district. The scheme is expected to be sanctioned by Government shortly. The 2,500 K.W. transportable power sets have been ordered.

17. *Madras Thermal Station.*—The existing undertaking of the Madras Electricity Supply Corporation is to be acquired by the Government at the end of August 1947. As the plant is barely adequate for erecting the existing loads and as large industrial and general demand for power is expected in the Madras City and its environs, it is proposed to instal an additional plant of 15,000 K.W. The plant has been ordered and will be in service at the end of 1949. The Basin Bridge Station is to be modernised and will have an ultimate installed capacity of 50,000 K.W.

18. *Moyar Hydro Scheme.*—A power house utilizing the tail waters of Pykara is under construction with an installed capacity of 37,500 K.W. The plant is expected to be in operation in 1949.

19. *Pykara Hydro Extensions.*—These extensions will complete the development. A dam is under construction and an additional generating unit capacity of 27,000 K.W. will be in service by 1951.

20. *Papanasam Extensions.*—These provide for increased water storage and an additional 7,000 K.W. generating set. Work is in progress and will be completed in 1948.

21. *Ceded Districts Grid Scheme.*—Pending supply of hydro-power from the Tungabhadra Dam an advance scheme for the development of the area by a grid has been sanctioned. Bulk power to the extent of 4,000 K.W. is to be bought from the Mysore Jog Hydro-Electric Scheme for a period of five years to supply this area until the Tungabhadra Hydro-Electric Station is brought to service. Work is in progress.

22. There are also a number of transmission and distribution schemes as also a few small power stations programmed for completion in this five-year period.

23. *Total cost.*—The ouatly on all these schemes will be in the neighbourhood of Rs. 15 crores and will result in *doubling* the existing capacity of power plant in the Province.

24. *Later Development Programme.*—Plans for the industrialization of the Province are yet to take concrete shape and it is too early to say what demand for power will arise from them. A large demand is expected from the rural areas mostly for lift irrigation and for various rural processing industries. The railways in the Province have also a programme for electrification of their main lines.

The pace of electrical development in the Province will be largely set by the pace of industrial development and the two are very intimately connected at all stages from planning to completion. To co-ordinate their plan and to control their development a joint Industrial and Power Board is necessary.

APPENDIX XI.

(*See* Chapter III, paragraph 39.)

NOTE ON POWER DEVELOPMENT IN MADRAS BY THE CONSULTING ENGINEER TO THE GOVERNMENT.

The possibilities of an Electrical Power System for Southern India, such as described, have long since been examined, and included in the plans of the Electricity Department.

There is no question as to whether the Mysore and Travancore Power Systems can be connected with advantage to that of Madras; they are now, for all practical purposes, in the process of gradual interconnection.

During the past few years, I have been associated with the power development plans, among others, of the Mysore, Travancore and Cochin States.

The general design, characteristics of supply, voltage and frequency, are in conformity with the Madras System in the cases of Travancore, Cochin and of the Jog Falls development in Mysore. The older installations in the latter State are to be gradually modernized.

In pursuance of these plans, the Madras and Travancore Power Systems are already interconnected at Tenkasi, while lines are now being constructed in the Bellary district to connect up with the Mysore System. Other connecting points are planned.

I am asking the Chief Engineer to forward a plan of the Madras Grid on which are indicated the points at which the interchange of power with Travancore, Cochin, Coorg and Mysore is planned.

It is to be noted that the Chief Engineers of the concerned Power Systems are in general agreement with such plans, and are co-operating accordingly.

The future power situation may be set out roughly as follows: The potential and actual hydro-power in the Province capable of economic utilization is about 750,000 K.W. at 60 per cent load factor. This is composed of primary and secondary power, and will require 125,000 K.W. in thermal stations to supplement the output of secondary power, and thus render the supply available throughout the year.

Of the above amount the department is planning to have a total of 275,000 K.W. of effective hydro-power available by 1955, and 80,000 K.W. of thermal stations. This includes the stations now in operation.

It is estimated that, allowing for a normal industrial development, including electrification of certain sections of the railways, the hydro-power resources of the Province might be exhausted by 1970. After that year, bulk supplies of power would be obtained from the 'surplus' States of Travancore, Cochin and from Coorg. Mysore is not likely to have power available for export in any large amounts.

Preliminary investigations of the potential hydro-power available for economic development in Travancore, Cochin and Coorg, to be confirmed in future by more detailed examinations, indicate that it may be possible to provide approximately—

	Total.	Probable surplus.
Travancore	450,000 K.W.	300,000 K.W.
Cochin	150,000 K. W.	80,000 K.W.
Coorg	40,000 K.W.	30,000 K.W.
Mysore	300,000 K.W.	None.

This surplus potential power would be developed as the demand required, with or without the financial assistance of the Madras Government, and exported as an industrial commodity in the interests of both parties.

With such a South Indian Grid, the power requirements of Madras might be met for the next thirty to forty years.

It has to be noted, however, that there is no 'cheap' hydro-power in Southern India, and such power cannot be economically utilized on a large scale in some metallurgical and chemical processes, as in the case of Norway and Canada. It is, however, sufficiently 'cheap' for the normal industrial requirements of the Province.

APPENDIX XII.

DISTRICT-WAR DETAILS OF THE FOREST AREA.

District.	Area of forests in the district in acres (as classified during the agricultural year 1945–46).	Total area of the district in acres.
Vizagapatam	1,340,199	5,198,106
East Godavari	864,855	3,639,741
West Godavari	116,525	1,924,838
Kistna	125,550	2,322,217
Guntur	455,869	3,689,845
Kurnool	1,648,622	4,872,894
Bellary	361,050	3,648,044
Anantapur	452,794	4,311,447
Cuddapah	1,156,056	3,790,752
Nellore	473,222	5,087,200
Chittoor	523,769	3,771,906
Chingleput	121,174	1,965,897
North Arcot	771,995	2,974,637
South Arcot	158,645	2,693,024
Salem	1,053,249	4,509,163
Coimbatore	1,428,138	4,551,876
Trichinopoly	149,650	2,768,554
Tanjore	24,421	2,398,316
Madura	728,985	3,118,930
Ramnad	62,131	3,078,246
Tinnevelly	308,936	2,776,422
Malabar	359,890	3,713,011
Nilgiris	312,863	628,887
South Kanara	517,209	2,577,295

APPENDIX XIII.

A NOTE REGARDING THE STARTING OF FOREST INDUSTRIES IN MADRAS PRESIDENCY BY MR. V. S. KRISNASWAMY.

On the 17th of October 1947, the Industrial Planning Committee constituted by the Government of Madras, recorded my views in connexion with the organization of forest industries in the Province. The Committee wanted information regarding most of the major and minor forest products and asked me to prepare a note covering the subject, stressing particularly on the nature of investigation and research, which may have to be undertaken to develop forest industries in the Presidency to the fullest possible extent, so that the Province may in course of time become self-sufficient in forest products and materials derived from them. Incidentally it was expressed that the idea of the Planning Committee was to suggest ways and means of augmenting the net revenue of the Forest Department by starting suitable forest industries.

2. At the outset, I wish to make it clear that the views expressed in this note are my personal views and need not necessarily be that of the Forest Department.

3. *Timber.*—It is not generally known that in India there are more than 2,500 woody species, whereas there are only about two hundred indigenous timber species in America. With such a large variety of timber species, it will be rather difficult to have a full knowledge of the possibilities of each timber. But research has been going on for some decades in the Forest Research Institute, Dehra Dun, and much useful information has been collected regarding a variety of species. Research so far done has revealed that India possesses timbers " unsurpassed in any other country ", though only very few species are in common use. These few species are used, regardless of their suitability for the particular purpose in view. Of the better known woods in this Presidency, teak stands pre-eminent. It is used as a general utility wood, principally because it is durable, does not warp and has a low shrinkage value. But Madras Presidency is not self-sufficient in teak and it has to depend on teak imported from Burma. Large quantities of teak timber has

been imported into this Province, in the past, from Burma. When the teak plantations raised in this Province become exploitable it is hoped that the Presidency will become self-sufficient regarding teak. But before that, it is certain that some of the lesser known woods will come into common use. At the present moment, teak timber which is costly, is practically beyond the reach of most buyers, even if it was available. Imports from Burma have not yet restarted in full vigour, to depress the prices. Since teak is in great demand for constructional work, the building trade is very much handicapped for want of the same, at reasonable prices, and it is not in a position to meet the present intense demand for more houses. As a result of these circumstances, there is a very great demand for *cheap and suitable* structural timber. The Chairman of the Committee wanted to know the extent to which this scarcity can be relieved by marketing other species of timber, either unprocessed or after seasoning or after preserving them. During the War considerable research work was done in this direction by the Forest Research Institute, Dehra Dun, and up-to-date information can be obtained from there, about cheap structural timbers of this Presidency. But it must be said that mainly on account of the distance of this Province from Dehra Dun, many of the South Indian species have not been adequately tested for their utility and further nobody appears to have bothered sufficiently about this, as the Province is a Teak Province.

4. My suggestions in this connexion are—

(1) To obtain the latest information from Forest Research Institute, Dehra Dun, about Madras species, especially regarding their suitability as structural timber ;

(2) to prepare short notes, with full technical data of Madras timbers, which can be used straightaway without special processing, like seasoning and preservation. (These should be widely published amongst those in the Building Trade, including the Public Works Department and they should be encouraged to use them.) ; and

(3) to take steps to instal, seasoning and preservation plants, for processing such species as can be used only after seasoning or preservation with chemicals, in places where such species occur abundantly or can be transported to, at economic costs. Information regarding the occurrence of the different species is available in the different working plans and where not available, special surveys regarding particular species can no doubt be undertaken. With the help of these seasoning and preservation plants, it will be possible to conduct experiments with other Madras timbers and such of them as are suitable can be brought into general use.

5. *Location of these plants.*—Timber species, as such, are available only in the Western Ghat region. Taking into account the location of Government and private forests, these seasoning and preservation plants may have to be installed to serve the following tracts. One to serve the Attapady and Silent Valley forests and the other to serve the Nilambur Division and other forests situated in the catchment area of Chaliar. Regarding the first locality the exact location of seasoning and preservation plants will have to be decided only after the present availability of timber and the existing commitments are considered. Regarding the second tract probably Chaliapuram will be a suitable place. It is just above the tidal reach, about 25 miles from Kallai and plenty of fresh water will be available. What is more the place can be reached by river crafts throughout the year from the railway line at Kallai. Tidal flow will be of great help in this connexion. Timber from Nilambur Division Evergreen forests and also from other private forests can be easily floated down to this place and after treatment can be floated down to Kallai, the biggest timber market in the West Coast. From Kallai, the processed timber can be sent by rail or by sea to the different markets of the Presidency.

6. *Plywood.*—For organizing the plywood industry, the most likely places occur only on the West Coast of this Presidency. Chaliapuram mentioned earlier will be a very good place because practically all the softwood which reaches Kallai has to pass through that place. There is already a small plywood factory at Kallai. There is also scope for starting a small plywood factory at Baliapatam as softwood timber suitable for plywood can be floated down to the factory from the interior evergreen forests situated in the northern portion of North Malabar. When once these plywood factories are started, after sufficient experimentation, compregnated wooden boards can no doubt be manufactured in the same places.

7. *Tea chest industries.*—The possibility of starting a tea chest industry in the Anamalai region near Valparai of Coimbatore South Forest Division may be investigated. The Evergreen forests containing suitable softwoods occur in the locality and a ready market for the produce can no doubt be found in the extensive tea estates of that area.

8. *Masonite and other wall boards.*—It is understood that the preparation of the ubiquitous wall board, called by many proprietary names, involves semi-digestion of wood and shooting out the cellulose in the manner of puffed rice into a pressure chamber. This cellulose is subsequently pressed under heavy pressure, after adding suitable preservatives and colouring matter. About the starting of this industry in this Province, which will probably be unique in India, unless the actual requirements of raw material are known it will be difficult to state anything now. The Forest Research Institute, Dehra Dun, will probably have complete literature on the subject and may be in a position to give advice.

9. *Softwoods.*—Most of our valuable softwood forests lie in the Western Ghats region of high rainfall. To meet the increasing demand for softwoods, there is a proposal to start concentrated plantations of softwood species in Malabar. It is understood that planting in right earnest will start as soon as the Government approve the proposal. When these softwood plantations become exploitable, they will be of great help, principally to the match industry of the Province.

10. *Firewood and charcoal.*—Creation of fuel plantations for meeting the demands of civilians and industries, for firewood and charcoal, is essentially a *forest industry*. Specially, short rotation fuel plantations like casuarina, odai (*Acacia planifrons*), eucalyptus, wattle, etc., are extremely paying propositions provided one can afford to wait for a few years in the initial stages. The fuel position of the Province is extremely critical and unless adequate steps are taken now alone the Province may have to import large quantities of firewood and charcoal from outside beforelong. While discussing this aspect of the problem, the Chairman of the Committee expressed the opinion that inasmuch as there are no local sources of petrol and fuel oils, producer gas vehicles must be encouraged. Therefore it is imperative that fuel plantations, especially of the short-term variety, should be raised all over the Province to meet the existing and future demands of the civilian population, industries and the producer gas vehicles for firewood and charcoal. The existing Government and private forests will be unable to meet the demand indefinitely if producer gas vehicles are encouraged.

11. *Suggestions for the future.*—The possibility of raising casuarina and other short rotation fuel crops in this Presidency in places where they are not now grown may have to be investigated in detail. The coastal strips have been investigated in a few districts and proposals for raising fuel plantations in them have been submitted. It is suggested that similar investigations may be done throughout the Presidency and a comprehensive plan prepared. Zamin lands also may have to be considered in this connexion. Regarding the lands in the interior, proposals have been submitted for afforesting nearly 200,000 acres of lands at the disposal of the Government in Madura, Ramnad and Tinnevelly districts. This proposal is awaiting the sanction of the Government. The zamin lands were excluded from the purview of the scheme. Only waste lands and foreshores of tanks were considered and the following principles were adopted in their selection :—

(1) Individual blocks of waste lands and the foreshores of tanks selected should have at least fifty acres of plantable area.

(2) There should be at least 1,000 acres of such plantable areas in a planting circle, which should not exceed five miles in diameter.

By adopting the principles mentioned above smaller extents of waste lands and foreshores of small tanks are automatically left out and they will be available for the grazing of village cattle and for the extension of cultivation of food-crops, etc. Therefore the public should not normally have any legitimate grievance. I suggest, that adopting the same principles, afforestation schemes may be prepared for all the districts of the Province, excluding probably the West Coast districts.

12. *Advantages in raising plantations.*—For one thing, these plantations when raised, will be nearer consuming markets and will give better yield than the present reserved forests. Therefore they should bring in more revenue. At the same time more firewood charcoal and other forest products will be available to the consumers nearer their houses at probably cheaper rates. Besides this, the following are some of the principal indirect advantages :—

(1) Plantations on the foreshores of tanks will trap silt and prevent the further silting up of tanks, which are even now heavily silted up. Especially in Ceded Districts, these tanks foreshore plantations will confer great benefit on the public, as the silting up of tanks is rather marked in those districts.

(2) These numerous small plantations raised all over the country will reduce the wind velocity, minimize run off of water and soil and thereby make for better conservation of water, soil and soil moisture, all beneficial to an essentially agricultural population.

There are other numerous advantages both direct and indirect which will accrue to the public, from these plantations, but they are not mentioned here, as they will be inappropriate in this note, which deals with forest industries.

13. *Irrigated Fuel Plantations.*—A few years back, the possibility of raising irrigated fuel plantations over about 26,000 acres in Coimbatore North Forest Division, utilizing the waters from Moyar was suggested. These plantations, when raised, will be on the foreshore of the lake proposed to be formed by the Bhavani Dam and will be within economic distance of Mettupalayam and Satyamangalam. The trace for the railway line between Chamrajnagar and Satyamangalam passes through the tract covered by this project. Also the high tension line of the H.E.D's Moyar project will pass through this area. This firewood plantation project will be well worthwhile re-examination in view of the altered circumstances obtaining at present.

14. *Destructive distillation of wood, charcoal and producer gas vehicles.*—From the point of view of this Province, which does not contain mineral oils, it will be good policy to encourage to the fullest possible extent Producer Gas Vehicles because Producer Gas Vehicles require charcoal and charcoal can be obtained from trees which can be grown. But the present forests of the Presidency will be unable to keep up a sustained supply of charcoal if a large scale introduction of Producer Gas Vehicles is ordered. A Producer Gas Vehicle requires on the average about 40 tons of charcoal per annum, and this corresponds to 200 tons of fire-wood. Unless fuel plantations or natural forests, capable of yielding this quantity of charcoal, year after year, can be earmarked for every Producer Gas Vehicle licensed, the present forests will speedily disappear.

15. *Suggestions for the future.*—If action is taken on the lines indicated in the earlier paragraphs, in a few years, the whole Province will be covered with numerous plantations in accessible places and it will be possible to support a decent number of Producer Gas Vehicles in this Presidency, without encroaching on civilian supplies of firewood and charcoal.

16. *Charcoal and charcoal briquettes.*—The methods by which charcoal production can be improved and the manufacture of charcoal briquettes, with special reference to Producer Gas Vehicles, were dealt with in a report submitted by me in 1942 to the Government. Orders on this report were passed in G.O. Ms. No. 142 (Development), dated the 8th February 1943. I suggest that this report may be considered by this Committee and suitable recommendations made for the future, especially regarding charcoal briquetting, which can be developed on cottage industry lines provided Producer Gas Vehicles continue to exist.

17. *Destructive distillation of wood and subsidiary industries.*—In the report mentioned in the previous paragraph a fairly full description of the destructive distillation method adopted at Bhadravathi will be found. My personal view is, that this industry will not be a paying proposition in Madras Presidency at the moment. The plant, however small it may be, should be located in a heavy forest area, as the daily firewood requirement of the plant will be about 250 tons of hardwood, if it is of the same size as the Bhadravathi plant. From this quantity of firewood about 60 tons of charcoal and 25,000 to 30,000 gallons of pyroligneous liquor may be expected. This retort-charcoal is very rich in condensed hydrocarbons as it is cooled in airtight chambers. This is very undesirable in charcoal to be used in Producer Gas Vehicles, as it means a high, potential tar value. Our heavy wooded areas are in the West Coast and the plant has necessarily to be sited there. From there to the markets for charcoal, it will be a long distance. Further the hard wood for the plant has to be obtained from selection fellings and the cost of firewood at factory site will naturally be high. The type of forest suitable for locating a destructive distillation plant is not available in our Presidency. It should be like a plantation of low grade hardwood species, of practically no saleable value, which can be clearfelled and used in destructive distillation plants. When wattle plantations are raised on a large scale, the wood after the bark is peeled off can be used for destructive distillation, but then Americans are manufacturing newsprint from wattlewood and newsprint is more important in our national economy, than the wood distillation products. Further there is no market in India for the by-products of wood distillation. It may be argued that by adopting "Suida" process pyroligneous liquor can be directly converted at cheap costs into acetic acid, without going through the intermediate stage of lime acetate as at Bhadravathi and that the acetic acid so manufactured can be marketed in Ceylon and East Indies. There is time yet to think of producing articles for an export trade.

18. *Manufacture of producer gas cylinders.*—The Chairman suggested that it will be possible to generate producer gas with the charcoal straightaway and compress it just like carbon-di-oxide, oxygen and hydrogen gases in cylinders and supply it to motorists. The advantage of this is that the heavy freight on charcoal to be transported to the market is saved and what is more the producer gas can be completely purified before it is compressed into the cylinders. This industry can be thought of when compact plantations of fuel species are formed on a large scale.

19. *Wattle plantations and subsidiary industries.*—The only two places in this Province where wattle can be grown in this Presidency are the Palnis and the Nilgiris. Proposals for growing wattle over about 15,000 acres in the Upper Palnis in reserved forests are under consideration. I understand that in the Nilgiris, about 6,000 acres of reserved forest land are likely to be available for growing wattle. Outside the Government reserves, it is just possible that some lands may be available, but this is not likely to affect appreciably the over all picture. If these 21,000 acres are planted up with wattle, the annual area to be cut will come to 2,100 acres, if a 10 year rotation is adopted. According to the data available at present, one acre of wattle plantation is expected to yield 5 tons of bark at the end of 10 years. Therefore the annual production of wattle bark from the forests of this Province may be placed about 10,500 tons per annum ten years after the area is planted up. This is just about 50 per cent of the estimated requirements of the Province.

20. *Costs.*—A financial statement was prepared in connection with a scheme prepared recently for growing wattle in the Upper Palnis. According to this statement, the investment on raising wattle over 1,500 acres, the annual regeneration area will come to Rs. 2,04,775. This amount includes interest on all investments at 3 per cent per annum from the year of investment till the wattle bark will become available for sale, ten years after the year of formation. The net revenue from this area is estimated at Rs. 6,37,500, assuming only Rs. 125 per ton as the sale price of wattle bark the current price being Rs. 275 per ton. From this it would appear that growing wattle, only for its bark, will be a profitable industry in the Upper Palnis.

21. *Wattle wood.*—As a bye-product of this wattle bark industry, at a very conservative estimate, nearly 30,000 tons of wattle wood will be available from a very compact locality every year. As the entire extraction charges have been debited to the wattle bark account, in the financial statement mentioned in the previous paragraph, this large quantity of wood will be available for further processing at very cheap rates practically for cost of collection.

22. *Industries which can be started with wattle wood.*—The wattle bark instead of being marketed as bark can be marketed as wattle extract. This will mean considerable saving in transport charges and besides an increased revenue. According to American literature " the spent bark from which Tannin has been extracted is of considerable value for pulping. Its strong fibre makes excellent wrapping paper." " The Drug and Oil plant project has run pulping tests on wood from Acacia Mollissima (wattle) and these have shown that the wood yields 52 per cent of paper pulp by the Soda or Sulphate process suitable after bleaching for book and fine printing paper." " Destructive distillation of Acacia wood yields excellent charcoal, as well as methanol acetone and pyroligneous acid." The possibility of starting any of the above industries will no doubt be borne in mind when the wattle regeneration operation in the Upper Palnis expand.

23. *Paper projects.*—Recently there was an enquiry from the Government of India regarding the availablity of raw materials for rayon, paper, pulp and wood pulp, etc., industries. In this connection a survey of the availability of bamboo, suitable grasses and other raw materials is proposed to be initiated. However, at the moment, the availability of raw materials for installing paper factories in some places has been investigated and the use are mentioned below.

24. *Papanasam paper project utilizing eta reed.*—Nearly 20,000 acres of pure and mixed reed areas occur between 3,500′ and 5,000′ elevation, in the catchment areas of Tambaraparani and Serviar. This is expected to yield 20,000 tons of dry reed a year on a 3 year felling cycle. The Forest Research Institute, Dehra Dun has tested the eta reed for its suitability for manufacturing paper. In its opinion, " in quality, the fibre of eta is superior to anything hitherto in use or experimented within India and it is at least equal to and possibly superior to the very highest grades of wood pulp." " In length of fibre which means strength it is so remarkable that it stands in a class by itself. Its maximum fibre length is 8·50 M.M. with an average of 4·38 M.M. and there are none of the short fibres under 1·50 M.M. which detract so much from the quality of an otherwise good material." The availability

of this excellent raw material has been examined at different periods by different officers. A note also has been prepared giving necessary information to those interested in the manufacture of paper in this locality utilising the eta reed. This paper project in my opinion is a first-class proposition, provided the details of extraction of the reeds are worked out carefully with an eye on economy. I understand that a party has been given a licence to work this project.

25. *Possibility of starting rayon industry utilizing Papanasam eta reeds.*—From every point of view Papanasam tract appear to be suitable for starting Rayon Industry. Not only cotton, but reeds which have exceptionally long fibre are available in the locality at economic costs. Water, fuel, electricity are all available in the tract and a 10-ton viscose rayon factory will be feasible. A capital of about 3·87 crores of rupees will be required for starting a 10-ton factory and this factory should be in a position to produce 1 lb. of rayon yarn at Rs. 1–2–6, a rate which is considered economic.

26. *Mettur paper project utilizing Kollegal Forest Division bamboos.*—The possibility of starting a paper factory at Mettur utilizing the bamboos which occur in Kollegal forest division was investigated about 15 years back. Investigations revealed that *Dendroca amus strictus* (Bamboo) the chief raw material for making paper occurred in sufficient quantities to supply a 5,000 tons paper plant. The project was re-examined twice subsequently and the latest note on the subject written by me has been printed as an appendix to the current Kollegal working plan. So far no private party has been interested in this project, though it is a good project and caustic soda in liquid form is available at Mettur itself.

27. *Botha Grass Paper Project and other investigations.*— When preparing the working plan of Cuddapah Forest Divisions the possibility of manufacturing paper at Cuddapah utilizing Botha (Cymbopogon coloratus) grass, as the principal raw material was investigated. The grass was tested regarding its suitability for paper, by hand processes by me and subsequently at Wardha. Large quantities of the grass were also sent to the Forest Research Institute, Dehra Dun.

28. *Opinion of A.I.V.I.A. on "Botha Grass".*—The opinion of the Research Institute is given below—"The semi-commercial tests carried out on Botha grass confirm the previous laboratory results, viz., that the fibre of the grass is very short and the bleached pulp obtained from it is not very clean. It is consequently suitable for the production of cheap grades of paper only and that too in admixture with a certain percentage of some long fibred pulp. The administration report of the Forest Department for the year 1936–37 or 1937–38 has been printed on paper made out of Botha grass pulp mixed with 10 per cent of bamboo pulp.

The opinion of the All-India Village Industries Association, Wardha, regarding this Botha grass is reproduced below :—"We do not find that it is necessary to mix bamboo with Botha grass. On the other hand, as bamboo pulp is more difficult to make and therefore more expensive, it is better to make paper out of Botha grass alone. We do not consider that a mixture of bamboo improves the quality of the paper."

Our findings in regard to making paper from Botha grass are as follows :—

"Pulp obtainable by hand processes 40 per cent. As the pulp contains natural sizing materials, the paper is by nature stiff and non-absorbent. So sizing is not necessary. Paper can be made of different thickness as desired. We consider Botha grass to be very well suitable to paper making."

From a recent reference it was understood that the Forest Research Institute, Dehra Dun, is interested in knowing the annual sustained supply of Cymbopogon coloratus, Botha as the suitability of this grass for paper and board manufacture had been tested along with other grasses.

From the above, it is clear that at least in admixture with bamboo, the "Botha" grass can be used in the manufacture of paper. Though Botha grass occurs extensively in the Ceded districts bamboo occurs in commercial quantities only in the Kurnool Nallamalais. I am sure it will be possible to discover an ideal site Giddalur-Markapur way where it will be possible to get adequate quantities of bamboo and Botha grass for a big paper plant and if necessary, a rayon plant also.

29. *Paper factory in Malabar.*—Earlier in this note I had suggested that Chaliar will be a likely place for starting timber industries. In my opinion it will also be an ideal place for installing a paper factory and if sufficient raw material is available a rayon factory also, because the bamboos and reeds which occur in the Government and private forests of Nilambur valley can be easily floated down to that place. In my opinion a 10,000-ton paper factory utilizing bamboo as the chief raw material may be installed there. This project is worth further investigation.

30. *Occurrence of grasses and other materials suitable for paper manufacture.*—Generally non-fodder grasses belonging to the lemon grass family, the Elephant grass, the sword grass, spear grass, strobilanthes, lantana, bow string hemp, aloes are all suitable for paper manufacture. I have made paper by hand-processes from the following materials and some of them have been tested by the A.I.V.I. Association also :—

Name of raw material.	Common name.
(1) *Cymbopogon coloratus*	Botha grass.
(2) *Cymbopogon martinii*	Rusa grass.
(3) *Cymbopogon caesius*	Ginger grass.
(4) *Cymbopogon flexuosus*	Lemon grass.
(5) *Heteropogon contortus*	Spear grass.
(6) *Themeea cymbaria*	Sword grass.
(7) *Imperatum species*	Elephant grass.
(8) *Lantana*	....
(9) *Strobilanthes species.*	....
(10) *Sanseviera Roxbunghiana*	Bowstring hemp.
(11) *Agave species*	Aloes and Sisal.

31. *Other opinions.*—Apart from my experiments I have also collected some information regarding the suitability of some of the above materials for paper manufacture and these are reproduced below :—

Opinion of A.I.V.I.A., Wardha, C.P., regarding Lantana.—" We have now completed our experiments with the lantana sticks you sent us. I am sending you herewith samples of paper made from them. We consider lantana quite suitable for paper making. It is better than straw or various kinds of grass, but not as good as sunnhemp or rags." Fibre content 40 per cent.

The opinion of Forest Research Institute, Dehra Dun, regarding Lantana is I think different. In any case, I think that after further experiments, if necessary, it will be possible to devise an economic way of making at least straw boards, card board, etc., from lantana which is a pest in our forests, especially in Salem North Forest Division. This requires further investigation.

Opinion of A.I.V.I.A., Wardha, C.P., regarding Bowstring hemp Sanseviera roxbunghiana (Marul).—We consider the fibre very good material for paper making being as good as sunnhemp or linen in regarding to percentage of pulp and quality of paper obtainable—pulp content 65 per cent.

As the fibre of this plant is usually used for making cordage, only where it is not used for such a purpose, will we be justified in using it for paper manufacture.

Opinion of A.I.V.I.A., Wardha, about strobilanthes.—The material is useless for manufacturing writing paper. It can be used only for manufactuting post card. The fibres are brittle and short—pulp content 60 per cent.

Opinion of the Forest Research Institute, Dehra Dun, regarding Strobilanthes Warrensis.—The laboratory tests show that the material gives a high yield of bleached pulp, viz, about 52 per cent but the average fibre length is very short being only about 0·88 mm. The material therefore is not suitable by itself for the manufacture of bleached papers. The pulp from the materials may, however, be utilized as filler in the manufacture of paper from other longer fibred materials.

32. *Further tests indicated.*—From the fo egoing it is clear that many of the raw materials of this presidency from which paper has been made by hand processes, have not been tested commercially. It is suggested that these raw materials, along with others may be taken up for serious sub-commercial tests with the F.R.I., Dehra Dun, or with the Mysore Paper Factory. Regarding the testing of the suitability of the local materials for rayon, suitable arrangements will have to be made in consultation with the Central Government.

33. *Final location of pulp, paper and rayon factories in the Province.*—As can be made out from the foregoing paragraphs survey of the availability of raw materials for paper manufacture, has been rather a haphazard affair. A few officers who happen to be interested in this, have taken the trouble to undertake the investigation, in the divisions where their work, lay at that time. This does not necessarily mean that the places they have suggested are the only places in the presidency in which it will be possible to work a pulp or paper mill at a profit. A thorough investigation of all likely places in the presidency and an unbiassed appreciation of the relative merits and demerits of each likely locality will be necessary, before settling the most advantageous location for straw board, paper and Rayon factories in th

Presidency. In other places where raw materials occur the possibility of developing the manufacture of inferior grade papers, straw boards, etc., by hand processes may no doubt be organized.

34. *Essential oil industry using fragrant products of forests.*—It will be possible to organize in this Presidency the essential oil industry utilizing fragrant products which occur in the forests, and which are now going to waste. As Eucalyptus oil industry has already been developed by private enterprise in the Nilgiris and to the extent possible in Kodaikanal Hills, I do not wish to write anything further about it. Grasses belonging to the lemon grass family occur in this Presidency over considerable areas and as these are not eaten by cattle except when they are young, they grow to maturity and get burnt. The possibility of establishing an essential oil industry in Coimbatore North Division was investigated by me in 1941–42. Experiments were conducted by me with Cymbopogon flexuosus (lemon grass) and Cymbopogon caesius (ginger grass) at Geddesal and at Bennari respectively. A suitable portable still was devised, in which water was boiled away from the fragrant grass. Cymbopogon caesius gave a better yield of oil nearly 2½ times that of Cymbopogon flexuosus. I do not have the records now with me, but if I remember right the cost of production of Cymbopogon caesius oil, otherwise known as ginger grass oil, came to about Rs. 2–8–0 per lb. excluding seigniorage on firewood used. In the market we could sell this oil for about Rs. 7–8–0 per lb. Cymbopogon flexuosus oil cost nearly Rs. 4–14–0 per lb. to manufacture and this also fetched nearly the same price. The distillation of oil from Cymbopogon caesius appears to have been dropped and only the distillation of oil from Cymbopogon flexuosus has been continued, though one would have expected the continuance of the former which is a better financial proposition. A battery of six stills which can be conveniently looked after by one Supervisor is considered to be an economic unit and in a month 120 charges can be done. The following statement furnished by the District Forest Officer of Coimbatore North Division will give an idea of the profitable nature of the industry. The figures of 1942–43 have not been given, as the unit was not fully developed then.

Year.	Cost of collection of grass.	Cost of collection of fuel.	Other costs including pay of Supervisor.	Total cost.	Total weight of oil obtained.	Total value of oil.	Profit or loss.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	LB. OZ.	Rs. A. P.	Rs. A. P.
1943-44	434 8 0	271 9 0	418 1 3	* 1,124 2 3	153 12	1,680 12 0	+ 556 10 9
1944-45	760 5 0	(Includes cost of fuel).	651 5 0	† 1,411 10 0	213 8	2,574 4 0	+ 1,162 10 0
1945-46	561 0 0	Do.	397 8 0	‡ 958 8 0	113 9	1,589 14 0	+ 631 6 0
1946-47	366 3 0	Do.	348 0 0	§ 714 3 0	109 4	1,529 8 0	+ 815 5 0

* Includes Rs. 300 per annum pay of Supervisor.

† Includes Rs. 379–9–0 being Supervisor's pay.

‡ Includes Supervisor's pay Rs. 367.

§ Includes Supervisor's pay.

The success of this cottage industry will depend on the availability of copious supply of water and fuel not to mention the fragrant grass. Grass itself can be used as fuel provided the "Sindwahe" type of furnace is used, but there may not be objection to use firewood as in most places where the fragrant grasses occur firewood is not a saleable commodity.

35. *Future of this industry.*—Though this industry was started on a small scale in Coimbatore North Division yet I think the scope for expanding this industry does not exist there, mainly on account of lack of adequate water supply. Taking all factors into consideration I think it will be possible to organize this industry on a larger scale in the Palnis and in Tinnevelly Division in Ambasamudram range. Near Mundanthurai which is near the Lower Dam of H.E. Department considerable quantities of Cymbopogon flexuosus occur, as also firewood. Water also is available in plenty there. In such a locality I am sure it will be possible to organize this industry on a large scale with a big still. Botha grass (Cymbopogon coloratus) also contains an essential oil which should be marketable judged from its fragrance. Distillation experiments have not been conducted with this grass so far and in my opinion it is well worth conducting the same in suitable localities, where scope for expansion of this industry exists. This grass occurs over more than about 2,000 square miles of reserved forest area in the Ceded Districts and the

development of an essential oil industry in that tract which has large supplies of vegetable oil will no doubt be welcome.

Also in Kodaikanal it will be possible to grow fragrant plants like Geranium which yield valuable essential oil. This has to be investigated.

36. *Minor forest produce.*—There is a large school of thought, that the minor forest products which occur in our forests are not properly exploited and marketed. Public also complain that adulteration is pretty common. The collection of minor forest products is mostly in the hands of contractors who lease out the products from the Forest department. Departmental collection of a few products was attempted in the past, but had to be given up for want of adequate staff and the difficulty of supervising the collection of products, which occur scattered over large areas.

I understand that a survey of the minor forest products of our province is being done by the Agricultural department as that department has facilities for analysing chemically the various forest products in its research institute.

37. *Present position described.*—In the foregoing paragraphs I have attempted to give an idea of the possibilities of organizing forest industries in this province and the nature of the work which remains yet to be done before serious steps can be taken in that direction. Except in a few instances investigations even regarding the availability of raw materials have not been done. In some cases utilization experiments have to be initiated for the first time.

38. *Suggestions regarding future.*—To enable this province to develop its forest industries on right lines, to the fullest possible extent there is necessity in my opinion for the appointment of a suitable Forest Officer for planning, initiating and developing, forest industries. This Officer will act as a Liasion Officer between the Forest department and the other departments of the Government. He must have a small trained staff to undertake special survey of availability of forest products and a research institute to help him to undertake small investigations. At the moment Madras has to depend on the Forest Research Institute at Dehra Dun for conducting investigations with its products. This Institute being an All-India one is not able to cope up with the work, and in most cases it has no time to take up the work of the Presidency as early as this Presidency would like it to. A small institute on the lines attached to the Mysore Forest Department can no doubt be started.

39. *More suggestions.*—This officer should be given opportunity to increase his usefulness by visiting places and institutes in India and outside, if necessary, where forest industries have already been started or are under investigation. Forest industries in my opinion should be manned by Forest Officers. The Government should have controlling shares in such industries as the produce has to come necessarily from forests which in most cases either belong to Government or will shortly belong to Government. In such concerns the Industrial Planning Officer mentioned earlier will necessarily have to be the Government Director to watch the interests of the Government.

If an organization like the one suggested is brought into existence at an early date, I am sure not only the industries mentioned in this note but many other allied industries can be investigated and the Government will be in a position to give authoritative information regarding availability of raw materials and the existence of other facilities, for starting forest industries, to entrepreneurs interested in the same.

40. I take this opportunity of thanking the Industrial Planning Committee, Madras, for having given me an opportunity to offer my views regarding "Forest Industries" which can be started in this Province.

APPENDIX XIV.

MINERALS OCCURRING IN EACH DISTRICT.

Anantapur.—Barytes, calcite, corundum, diamond, fuller's earth, gold, lead, ochres (yellow), quartz, steatite, asbestos, chromite, clays.

Arcot, North.—Iron, limestone, ochres (yellow), pyrites, steatite, garnet, ochre (red).

Arcot, South.—Iron, ochres (yellow), clay, lignite, ochre (red).

Bellary.—Copper, diamond, gold, iron, limestone, magnesite, manganese, ochres (red), ochres (yellow), oxides (red), steatite, clays, lead, pyrolusite, emery.

Chingleput.—Clays, glass sands, iron, limestone, magnesite, manganese.

Chittoor.—Mica, corundum, gold.

Coimbatore.—Asbestos, clays, corundum, gold, iron, kyanite, limestone, manganese, steatite, zircon, copper, mica.

Cuddapah.—Aluminium, silicate, antimony, asbestos, barytes, china clay, clays, copper, diamond, galena, iron, lead, limestone, ochres (grey), ochres (red), ochres (yellow), silver, zinc, gypsum, slate, red oxide.

Godavari East.—Coal, combustible gas, diamond, graphite, molybdenum, quartz, clay.

Godavari West.—Iron, limestone, mica, ochres (red), oxides (red), phyrotite, coal, graphite, ilmenite.

Guntur.—Barytes, copper, diamond, fluorspar, iron, lead, limestone, steatite, clay.

Kanara South.—Corundum, iron, steatite, china clay, lignite.

Kistna.—Chromite, diamond, graphite, iron, limestone, sulphur, garnet.

Kurnool.—Antimony, barytes, china clay, clays, copper, diamond, iron, pyrites, lead, limestone, magnesite, manganese, ochres (yellow), oxides (red), silver, slate, steatite, zinc.

Madura.—Gold, iron, manganese, molybdenum, tantalum, columbite.

Malabar.—China clay, garnet, gold, ilmenite, iron, lignite, magnetite, monazite rutile, sillimanite, zircon.

Nellore.—Barytes, calcite, china clay, copper, copper at Narasimhapuram yet to be investigated, fluorspar, garnet, gypsum, iron, kynaite, manganese, mica, ochres (red), ochres (yellow), slate, steatite, zircon, columbite, tantalum, coal, emery, quartz.

Nilgiris.—Gold, iron, manganese, mica, ochres (red), clay, coal, copper, felspar, garnet.

Ramnad.—Garnet, ilmenite, limestone, zircon, coral stone.

Salem.—Asbestos, barytes, bauxite, beryl, chromite, corundum, garnet, gold, iron, limestone, magnesite, mica, potash, felspar, quartzite, rock crystal, silver, steatite, charnokite, magnetite.

Tanjore.—Black sand, garnet, ilmenite, monazite, quartz, zircon, lignite, magnetite, rutile, sillimanite.

Tinnevelly.—Garnet, graphite, ilmenite, iron, limestone, monazite, mangetite, rutile, sillimanite, zircon.

Trichinopoly.—Apatite, celestite, cherts, copper, corundum, flints, gypsum, iron, limestone, magnesite, ochres (red), phosphates, quartzite, strontium minerals, tantalum, tungsten, zircon, chalk, clay, charnokite, columbite, fibrous calcium carbonate, felspar, garnet, ochre (yellow), steatite.

Vizagapatam.—Graphite, iron, limestone, manganese, monazite, quartz, apatite, garnet, mica, steatite.

APPENDIX XV.

(*See* chapter XII, paragraph 125.)

DISTRICTWAR LIST OF EXISTING WORKSHOPS.

District.	Name.	Number of men employed.
(1)	(2)	(3)
Madras ..	Richardson and Cruddas Workshops, Rayapuram ..	172
Do. ..	National Engineering Works, Rayapuram	7
Do. ..	Massey's Engineering Works, Rayapuram	150
Do. ..	Chitram & Co., Rayapuram	78
Do. ..	Rally & Co., Workshops, Rayapuram	17
Do. ..	Volkart Bros., Beach Engineering Works, Georgetown ..	15
Do. ..	Binny & Co., Beach Engineering Works	670
Do. ..	Kutty & Rao's Engineering Works, Armenian Street, Georgetown.	70
Do. ..	Bombay Engineering Works, Georgetown	21
Do. ..	Jayalakshmi & Co., Georgetown	11
Do. ..	Victory Engineering Works, Georgetown	23
Do. ..	Madras Engineering Works, Mint P.O.	53

District.	Name.	Number of men employed.
(1)	(2)	(3)
Madras ..	The Crompton Engineering Works, Kondithope ..	268
Do. ..	The Maxwell Engineering Works, Kondithope	43
Do. ..	Hindustan Engineering Works, Madras	16
Do. ..	V. R. Govindaswamy Engineering Works	8
Do. ..	Swaminathan Engineering Works, Parktown	15
Do. ..	Ramachandra Surgical Works, Parktown	18
Do. ..	Ramakrishna Engineering Works, Parktown	10
Do. ..	The United Commercial Syndicate Workshops, Madras ..	(Return not received)
Do. ..	Lakshmi Engineering Works, Choolai	47
Do. ..	Esser Engineering Works, Choolai	66
Do. ..	Industrial and Commercial Workshops, Vepery	101
Do. ..	A. G. Rajoo & Co., Chintadripet	19
Do. ..	Standard Engineering Works, Mount Road	(Return not received)
Do. ..	C. B. Ratnam & Co., Mount Road	6
Do. ..	Associated Trading Corporation, Mount Road	38
Do. ..	Nayanar Engineering Works, Mount Road	5
Do. ..	The City Engineering Works, Mount Road	16
Do. ..	Ranjan & Co., Madras, Ltd., Mount Road	28
Do. ..	The Bijou Workshops, Mount Road	14
Do. ..	Jwalasing & Sons, Mount Road	9
Kistna ..	The Andhra Scientific Co., Ltd.	478
Do. ..	Radhakrishna Engineering Works	16
Do. ..	Sri Purla Expellers Spares Manufacturing Company ..	30
Do. ..	Bharat Mechanical Works	20
Do. ..	The Universal Engineering Company	44
Do. ..	Diamond Machinery Manufacturing Works	384
Do. ..	Sri Saibaba Engineering Works	17
Do. ..	Metropolitan auto-Electric Works	14
Do. ..	Sri Durga Industries	(Return not received)
Do. ..	The Pioneer Gas Producer Works	Do.
Guntur ..	P. Govindaraju & Sons (Engineers and Merchants) ..	133
Do. ..	P. V. K. Choudary's Technical Training Civil Centre ..	(Return not received)
South Kanara.	The Commonwealth Engineering Works	75
Do.	St. Joseph Asylum Industrial Workshops	145
Trichinopoly.	St. Therese Engineering Works	13
Do.	Sri Ram Engineering Works	14
Do.	Central Automobiles	13
Do.	Jayalakshmi Works	24
Do.	St. Theresa's Mechanical Engineering Workshops ..	14
North Arcot.	B. K. A. & Co., Engineering Works	21
Do.	Binny & Co. (Madras) Ltd., Engineering Works ..	135
Do.	Royal Engineering Workshop	24
Tinnevelly.	General Metal Trading Co., Ltd.	36
Do.	The Bravi Engineering Works	50
Do.	Madura Company's Workshop	17
Malabar ..	St. Joseph's Industrials	29
Do. ..	Bharath Engineering Works	16
Do. ..	St. Vincent Industrials	340
Do. ..	Calicut Electric and Novelty Stores	24
Do. ..	Shanmugam Engineering and Trading Company ..	31
Do. ..	St. Vincent Technical School.	23
Do. ..	Raju Engineering Works	16
Do. ..	Brunton & Co., Ltd.	175
Chingleput.	Vivekananda Industrial Engineering Works	55
Do.	Kanta Industries and Scientific Instruments Trading Company.	44
Tanjore ..	P. Govindapillai Workshop	17
Do. ..	Anand Industrials	5
Madura ..	Blakstone Workshop	23
Do. ..	C. K. Venkataranga Row Carpentry Workshop ..	16

APPENDIX XVI.

(*SEE* CHAPTER XII, PARAGRAPH 127.)

LIST OF MACHINERY MANUFACTURED IN THE MADRAS PROVINCE.

A. AGRICULTURE.

(a) *Machines.*

1 Expellers.
2 Machinery for sugar factory.
3 Rice, flour, coffee grinders.
4 Grinding mills, centrifugal and rotary pumps, Pintomodel oil chekkus.
5 Flour mills, rice hullers and disintegraters.
6 Saw mills, oil mills, machines for plywood factories.
7 Machine for rubber estates.
8 Machines for tea plantations.
9 Tea roller.
10 Coffee peeler.

(b) *Machine parts.*

1 Rice, coffee, flour and other spare parts.
2 Casting of pistons.
3 Spare parts of expellers.
4 Wheels of expellers, still chambers, engine pumps, centrifugal livers, huller screens, huller blades, water jackets.
5 Spare parts for tobacco machinery.
6 Expeller spares like worms, gears, main bearings, timing gears roller and driving shafts, levers, valves, brackets, oil spindles, exhaust valve pins, fuel pump plunger, bushes, lickerin rollers, feed rollers, small brass and cast-iron castings, disintegrators, parts like beaters, grits, beater pins, etc.
7 Spare parts for machine in saw mills, oil mills, rubber estates, plywood factories.
8 Spare parts for machines in rubber and tea plantations.
9 Rotary oil chucks.
10 Log sawing band saws.
11 Coffee and tea factory, machinery spare parts.
12 Spare parts for plywood machinery.
13 Spare parts for saw mill machinery.
14 Huller white metal bearings.
15 Spare parts for rice and flour hullers, steel boilers, water pumps, liner, piston, huller screens, blades, holders, winnowers, cylinders and shaft.
16 Spare parts of oil expellers and chucks, mortar and pestle.

(c) *Machine tools.*

1 Cutters for planers and moulders and plywood machinery.

B. MACHINE PARTS.

1 Spare parts for cotton pressing machinery.
2 Textile factory spare parts.
3 Hosiery needles.
4 Gear wheels, levers, rollers, shafts' cast-iron brackets.
5 Spare parts (cotton spinning and weaving mills).

C. TRANSPORT.

(a) *Machinery.*

1 Greasing equipment, spray guns.

(b) *Machine parts.*

1 Spare parts for petrol pumps and other small components.
2 Motor bodies.
3 Motor Vehicle parts such as king pins, brushes, spring-bolt pins, etc.
4 Automobile engine parts.
5 Piston sets and cast iron alloy.
6 Air and exhaust valve sets, piston pins, bushes, gasket for trucks, diesel engine and diesel engine parts.
7 Gas producer plants.
8 Cradle racks.
9 Gear wheels, spare parts of motor vehicles.
10 Charcoal gas plants.
11 Automobile parts and road roller parts.

C. TRANSPORT—*cont*

(*c*) *Machine tools.*

1 Garage, jacks and other equipment.
2 Welding and lathe works.
3 Rewinding of traction motors and armatures.

D. GENERAL.

(*a*) *Machines.*

1 Machinery for ceramics factory.
2 Cotton covering machines for electric wires.
3 Machines for handmade paper.
4 Acetylene-generators.
5 Rolling machines.
6 Water hose repairing device.
7 Machines for tile factories, soap factories.
8 Machines for soap, tile and similar industries.
9 Tile machineries.
10 Most machines of reasonable size (not too large) built of cast-iron and mild-steel and not requiring special heat treatment of metals or specially hard metals, and not necessitating highly accurate working to gauges.
11 All the machines used in the manufacture of reinforced concrete hume pipes.

(*b*) *Machine parts.*

1 Spare parts for oil and steam engines.
2 Bed plates' gear wheels.
3 General engineering goods.
4 Metal castings.
5 Fire fighting and A.R.P. requisites.
6 Castings in iron, brass, etc.
7 Spare parts to oil and steam engines.
8 Spare parts for lathe, drilling, milling, shaping and planing machines.
9 Piston rings, bearing of lathes and pulley centres.
10 Structural steel work.
11 Many spare parts.
12 Producer gas plant parts.
13 Bearings and pinions.
14 Shaftings, toother wheels and gun metal bushes.
15 Bolts, bearings of pistons, small valves, piston rings, piston liners, exhaust valve, spring collars, air valves, tin rollers, pedestals, piston rods, shellers, coir beltings.
16 Machinery parts.
17 Hydraulic presses.
18 Redrying plants, etc.
19 Spare parts for cement manufacturing machines.
20 Spare parts for steel rolling mills.
21 Spare parts such as cylinders, valves, pistons, gudgeon pins, loom parts, picking bowl, cams, gears, etc., for tile factories, soap factories.
22 Spare parts of gas and oil engines with the exception of forgoing and crank shafts.
23 Pulleys.
24 Transmission gears.
25 Spare parts for tile factories.
26 Pug mills, rollers, piston rings, bearings, exhaust valve, etc.
27 Tooth wheels.
28 Shafts, beds, bolts, nuts, cam bearings, etc., of match factory machineries.
29 Spare parts for tile factory machinery.
30 Cylinder heads, liners, pistons, etc.
31 Generator vaporisier for gas producer.
32 Manufactured compressors.
33 Treadle machine nuts, bolts, runners, turner holders, cutting machines, threads, bolts and nuts.
34 Rings and bearings for engine and parts for screw presses, tooth wheels and minor rough castings.
35 Oil engine parts, king parts, bushes, rings, valves, automobile parts, bolts, pins, axes, shafts, cylinder sleeves, drilling machines, blower and hand tools gin spare parts.
36 Spare parts (ginning factory).

G. GENERAL—*cont.*

(c) *Machine tools.*

1 Small tools such as discs, punches, cutting and revetting tools.
2 Machine tools.
3 Planing machines.
4 Lathes.
5 Shaping machines, drilling machines.
6 Die presses, vices, hot presses.
7 Paper cutting machines.
8 Hand presses and hydraulic presses.
9 Printing types and printing blocks.
10 Scientific instrument manufacture.
11 Surgical instruments, sheet bending machines, welding apparatus, die machines for making splints.
12 Bandar rolling and labelling machines.
13 Parts for old planing, shaping and lathe machines, etc.
14 Machine tools.
15 Screw thread making and knives of match factories.

APPENDIX XVII

(See Chapter XXII, paragraph 229.)

MR. CHOWDARY'S REPORT ON LEATHER AND LEATHER GOODS INDUSTRY.

I. (A) The South Indian tanning industry is well established and important Industry of the Presidency.

The immensity of the industry can be understood from the following figures :—

(*a*) *Number of tanneries in the Presidency.*—According to Dr. Naidu's enquiry there are more than 407 tanneries in the Province. There appear to be about 425 tanneries in the Presidency. Figures are being collected and more complete information is sought to be obtained.

(*b*) *Number of workmen.*—According to a rough estimate during the year 1928–29, 19,300 were engaged in this industry and trade. According to Dr. Naidu " Workers directly employed in the various processes of tanning number more than 20,000, and those indirectly employed more than 10,000." Thus the total number of workmen exceed 30,000.

(*c*) *Amount of money earned as wages by the workmen.*—At an average minimum rate of Rs. 20 (including dearness allowance), it might be estimated that the earned wages will not fall below 6 lakhs per month or 72 lakhs per year.

(*d*) *Value of leathers tanned.*—The average annual value of tanned hides and skins exported during the years 1939–46 amounted to 417 lakhs of rupees. The local consumption or internal trade might be computed to be 25 per cent of this. Thus the total annual value of leathers tanned can be roughly estimated to be 5·2 crores of rupees.

(*e*) *Amount of capital invested in the industry.*—Dr. Naidu states that " it is not easy to compute the amount of capital invested in this industry, but it will well exceed 2 crores of rupees."

(B) *Location of the industry in the Presidency.*—The tanneries are located in all the 24 districts of the Presidency. The greatest number are located in North Arcot and Chingleput districts. Next in order come Trichinopoly, Madura, Vizagapatam, West Godavari and Kistna districts.

II. *Special features of the industry.*—(1) The tanning of leather comprises of a series of processes, each varying in time and in degree of skilled labour. The total duration through which a hide or a skin has to pass through the several processes is about 35 and 25 days respectively.

(2) The operations in the tannery are being conducted by workmen skilled in their work, though uneducated. The absence of regular trained leather technicians in these tanneries is very marked.

(3) The greatest portion of the finished leathers are sent from the different tanneries to Madras—Periamet—where they are selected and sold for export.

(4) The biggest foreign country that buys these leathers is the U.K.

(5) The two chief raw materials of the industry—the raw hides and skins and the tanning materials—are not to a great extent, of local origin or produce.

The quantity of raw hides, more than skins, available in the Presidency is not sufficient to meet the requirements of the tanning industry. As far as hides are concerned, it can roughly be estimated that about 80 per cent of the total requirements of the Presidency is obtained from other Presidencies, chiefly Bengal and United Provinces, the remainder 20 per cent being from the Central Provinces and local sources (from slaughter houses).

As far as the tanning materials are concerned, the production of the *avaram* and *konnam barks*—the two barks that were being used in the tanning of leather from a long time—in the Presidency is not sufficient to meet the requirements. It can be roughly estimated that about 40 to 50 per cent of the requirement is imported from the neighbouring states of Mysore and Hyderabad.

The wattle bark which is being solely used in the tanning of hides is imported from South Africa. The stoppage of the import of wattle bark, due to the cessation of trade relations with South Africa has, it is not an exaggeration to state, upset the South Indian hide tanning industry. This opportunity was seized by a few foreign companies to import other tanning materials or extracts for use in the tanning industry. This entailed a certain amount of loss to the tanners.

III. *Problems of the leather industry*—(A) *South Indian tanning industry*.—An *Ad Hoc* Committee on Leather and Leather Goods was formed by the Government last March to consider and report on the methods and means of developing the tanning and leather goods industries in the Presidency. The Committee has been carrying on this work. It may be some months before the Committee may submit its report to the Government. The several problems that have to be investigated and solved out for fostering the industries are being considered. Yet a general outline of these problems is given below :—

(1) There are no statistics relating to the leather and leather goods industries. The only information available is the total exports of tanned hides and skins and of myrobalans and import of wattle bark. The degree of paucity of the information available can be understood from a study of the report of the court of enquiry into labour conditions in the tanning industry of the Presidency. The type of information available at present does not materially help in suggesting methods for the development of the industries. The statistical information obtained should be from a technical standpoint of view if it is to be of the type expected by the Committee in the preparation of an Industrial survey of the Province.

(2) Improvement in the method of flaying of hides—more fallen—in the villages. The loss to the Presidency, on account of defective flaying of hides and skins is roughly estimated to be about 15 lakhs per annum.

(3) The methods of curing or preservation of hides and skins have to be improved.

(4) A greater and fuller use of the indigenous tanning materials has to be aimed at. This involves—

(*a*) Complete technical, if not scientific, study of the different tanning materials with regard to their use in the tanning industry, with special reference to the economic aspect of it.

(*b*) Attempts at producing in larger quantities, the indigenous materials already being used in the industry, e.g., chiefly *avaram* and *konnam barks*.

According to an announcement in "The Hindu" of the 9th July last "the Nizam's Government have sanctioned a scheme for the development of flaying and tanning industry in the rural areas at an estimated cost of Rs. 9,83,000. The scheme aims at the establishment of 20 tanning units in the Dominions." If this is successfully pushed through, the *avaram* and *konnam barks* will be used in the Dominions to an extent greater than at present. This is bound to adversely affect the quantities of these two barks that the Presidency is now importing from the Nizam's Dominions.

(*c*) Attempts must be made to produce the less or little used barks, that may be found on investigation to be suitable for use in larger quantities.

(*d*) Attempt should be made to increase the output of wattle bark in the Nilgiris and the Palnis both by the State and private planters by increasing the rate of cultivation.

(B) *Partly and usefully diverting the South Indian tanning industry*—(i) *Dyeing and finishing of tanned kips and skins for export*.—Attempts should be made to dye and finish the tanned hides and skins into other and superior classes of leathers which can be consumed locally or sold in other presidencies in India or in the Far Eastern markets. This will help the present predicament of the South Indian Tanners. They are at present paying higher prices for raw hides and skins, for the tanning materials, for the labour and still the ceiling prices of the exported hides and skins are not increased to a degree commensurate with the heavier expenses

shown above not to speak the increase of the cost of living of the tanners themselves. This development should be taken up as a long range policy extending over a period of 10 to 15 years. This work should be taken up by the State. It need not be apprehended that this would mean closing down, once and for ever, the export of South Indian Tanned Hides and Skins. All the leathers tanned in the Presidency do not fetch the same price. They are graded into qualities and the prices are fixed according to the grades. It is suggested that such of those grades that fetch profitable returns might still be exported. These of the lower grades may be dyed and finished as uppers for local consumption.

The methods suggested are—

(*a*) The State—Department of Industries—should run small Dyeing and Finishing Units in important Centres in the Presidency.

These finished leathers might in the first instance be made into all classes of leather articles, by attaching a leather goods manufacturing section to each of these units. Later when the quality of leathers manufactured have improved the finished leathers may be put on the market as leathers.

I might point out that such units are already included in the scheme of the Nizam's Government for the development of the tanning industry.

If the finishing units are to be started machinery will be needed. It may take some time for the machinery to be imported from foreign countries. In the meantime attempts might be made to manufacture these locally, though it may take some time to reach the degree of perfection.

(ii) *The manufacture of sole leathers from tanned kips.*—The sole leather forms the bottom of every kind of footwear from the sandal to the boot. A good portion of the soles for use in the footwear industry in the Presidency is at present being imported from Cawnpore. During the last War, there were 29 centres or tanneries selected by the H.M.G. where the sole leather manufacture was being carried on. The manufacture of this class of leather should be attempted to be popularized. The Department of Industries might either demonstrate the manufacture of this class of leather or open one unit to start with.

(C) *Manufacture of leathers on modern lines.*—In this class all the processes of leather manufacture are done in the same tannery from the start to the finish according to modern methods. There are very few of this type in the Presidency not more than 4 to 6. The two important ones at Madras are the Chrome Leather Co. and Gordon Woodroff, Ltd. Another is the N.M.K.'s Tannery at Trichinopoly. This is the biggest Indian concern of this kind in South India. Another is the Madras Industrial Leather Co. I might state that the two latter are technically manned by the old students of the Institute. The increase in the number of this class of tanneries has been very slow, in the Presidency. It might be hoped that, with the present change in general outlook, this line of work will develop to a greater degree. There are, it has to be said however, a few reasons which may perhaps hinder the quick development—

(1) One important reason is the competition of foreign countries. This industry has to be protected by Tariffs or other suitable means.

(2) There is the lack of machinery required for the purpose. It may not be possible to obtain the leather tanning machinery for another 2 or 3 years. The Government should arrange with the Indian Trade Commissioners in London and U.S.A., to obtain these machinery at an early date.

(3) There is a real shortage of leather technicians who can manage and run these tanneries. The State should take the responsibility of coaching up the technicians. This subject is dealt with in detail later.

(4) Non-availability of information, more than data, regarding the potentialities of the manufacture of a particular class or classes of leather that will find ready and favourable markets, and the ready markets for the different classes of leathers. This information is of great importance to one who starts a fresh industry or a fresh line of an industry. No body or organization other than the State can undertake to secure this information and make it available for the public.

Leather goods manufacture.—Any attempt to increase the production of different classes of leathers would fail in its result, if attempts are not made simultaneously to increase the consumption of the leathers tanned or if new sources or channels of consumption are not shown to the tanners. The leather goods industry, specially footwear, forms therefore an important and necessary adjunct to the tanning industry.

A sandal or a shoe may roughly be considered to be made of three classes of leathers. Sole or heavy leather for the bottom, and upper leather for upper and

lining leather. Thus if leather goods manufacture is also set up in the Province along with leather tanning the quantity of the different classes of leathers manufactured could be easily and readily consumed.

Footwear can be manufactured by hand and with hand driven or power driven machinery. Large leather goods manufcaturing units of any of the or all three kinds should be encouraged to be started.

Here again information regarding the class or classes of footwear that would find a ready market should be collected and made available by the State for the benefit of the leather goods manufacturers.

Technicians in leather technology—Training of.—There is at present provision in Madras for the training of the following classes of leather technicians :—

(i) *Research workers.*—Either B.Scs.' in Leather Technology or in Chemistry are trained for this at the Institute of Leather Technology.

(ii) *B.Sc. graduates.*—At the A.C. College of Technology : 2 years' course after passing B.Sc. in Chemistry.

(iii) *Licentiates in leather technology.*—Three years Diploma Course at the Institute of Leather Technology followed by one year's apprenticeship in a tannery : Minimum qualification a pass in S.S.L.C. Examination.

(iv) *Tanner operatives—One year's course.*—Specialization in a particular section of a tannery : ability to read and write : previous tannery experience essential.

(v) *Part-time course—Duration 3 to 6 months.*—Leather Technicians can undergo training, more practical than theoretical, in any particular branch or section of leather tanning. This may be taken as a sort of Refresher Course.

Under this scheme, a B.Sc. in pure chemistry may be trained in the Analysis of the materials and Products of Leather Manufacture to render him fit to work as a control chemist in a tannery.

Thus there is a chain connecting the Tannery Operative to the Research worker in Leather Technology. The need and utility of every class of these (i) to (iv) need not be emphasized. The Tannery Operative (iv) specializes in his own particular work, i.e., particular section of the tannery. The Licentiate (iii) is given sufficient knowledge of the basic scientific principles of leather manufacture in addition to sound practical training in all sections of the tannery, i.e., he is a tanner operative of all sections. He will therefore be able to supervise and guide the work of the Tanner Operatives under him in the different sections of the tannery. The B.Sc. (ii) is imparted instruction to a higher degree in the Science of Leather Manufacture along with practical training in tannery, i.e., in the actual manufacture of different classes of leathers. He is given sufficient scientific training to be able to understand and set right any defects found in any particular process. Further he will be able to so alter the processes as to suit any unavoidable and unexpected condition in the tannery or quality of the several raw materials handled in the tanning industry.

Research work.—The importance of Research work in the development of an industry has been well recognized. At the present time, there is more need for applied than for fundamental research in the Leather Industry in the Presidency. I give hereunder a few points to show the importance of and need for Research work in the Leather Industry.

Although the tanning of leather is an old industry in the province, if not the country, yet the manufacture on modern methods as practiced in the Western countries is of recent growth and has not developed to the extent commensurate with the number of hides and skins available in the country.

The literature that is available regarding the manufacture of leather in England and U.S.A. cannot be followed into in this country or province because of the following reasons :—

(i) The minimum and maximum temperature of this province is different from that of the Western countries 30° C., i.e., 86° F. is considered to be the maximum temperature in the cold countries. The temperatures in the different parts of this province is not the same. Temperature plays an important part in several of the processes of leather tanning. It can therefore be seen that many of these problems have to be studied with special reference to Indian conditions and the optimum conditions thereon determined.

(ii) The nature and quality of the hides and skins in this country differ fundamentally from those of the cold countries. These variations have to be carefully studied with reference to the quality of the final leather to be obtained. This needs a co-ordinated work between the Industries and Veterinary Departments.

(iii) The tanning materials available and used in Western countries are different from those in this country. There is abundant literature on the Western tanning materials. The literature on the South Indian tanning materials is very scanty. Every one of the available indigenous tanning material has to be individually studied in detail with reference to the particular class of leather, it is most suitable for. Then the possibility of the use of blends of these for the making of several classes of leathers has to be worked out, with special reference to the economical aspect of it. This is a long range work but one that has to be taken up immediately. The Departments of Industries and Forests should work in co-ordination. To give an instance, before the 1st War avaram and konnam barks were being used in the tanning of hides and skins in South India. After the 1st War wattle bark from South Africa was introduced into the industry. This bark has replaced the indigenous tanning materials, that were being used before to a very great degree. The average annual value of the imports of wattle bark into the Presidency during the years 1939–46 is Rs. 36 lakhs, i.e., about 7 per cent of the value of tanned leathers exported from this Province. With the Cessation of Trade Relations with South Africa the import of wattle bark had ceased. It has been a problem to find out a substitute for it from out of indigenous tanning materials. There had been no systematic and scientific study of the South Indian tanning materials. The information that was available on the different tanning materials was too scanty for one to be able to quickly solve the problem. The work had to be started afresh and is being carried on.

(iv) Methods of manufacturing classes of leathers that are not being produced at present have to be worked out. Glace kid leather, chamois leather, roller skins, belting leather are a few examples of these. In preparing these leathers, attempt should be made to maintain the quality of the imported leathers.

(v) With the advances of applied science, the tanning materials are not conveyed over long distances but are converted into tanning extracts. Myrobalams form one of the important tanning materials that is exported from this country. This is converted into an extract at the place of arrival in the Western countries. About 90 per cent of the myrobalams imported into the United States is received as raw material and most of this is converted into extract before it reaches the tanner. The share of Madras in the total export of myrobalams from India may not be more than 10 per cent yet the possibility of preparing blended tanning extracts from the indigenous materials should be explored.

General—Leather Industry—I. Technical training.—(*a*) Apprenticeship for the leather technicians passing out of the Institute must be provided for by the State by legislation.

(*b*) The technicians turned out should not be left unemployed for a long time. The tanneries (run on modern lines) already existing or those that are to be started later should be induced, if not compelled, to take in leather technicians.

(*c*) As pointed out earlier the present South Indian tanneries do not employ any trained leather technician. Every tannery that soaks 200 hides or 500 skins per day or more may be induced to employ leather technicians. The advantages of this may be easily realized by the tanners.

It shall be the aim of the State that every person who is in technical charge of a tannery should know the three 'R's of Leather Technology.

II. The role of the cottage tanning industry in the development of leather industry.—The place of Cottage Leather Industry in the development of the leather industry on a large scale cannot be ignored. It has to be remembered that the raw hides—Fallen hides—are mainly obtained from the villages. If the raw hide is not supplied to the tanner in the best cured or preserved condition any amount of technical skill or technical knowledge cannot help in the making of it into a superior class of finished leather. The cottage industry should be developed in a manner and to a degree to be able to supply the best cured raw hides and skins or even pickled hides and skins from groups of villages. The cottage tanning industry may be developed to a stage when the beamhouse work might be done greatly, if not entirely, in the villages. This system will also spread the industry over a longer range inside the Province and provide work for a greater number of workers. This will also be a help, in that a large capital need not be invested in selected centres of leather tanning and that it can be carried in different units or centres with lesser capital.

III. Industrial survey.—It has been agreed by the Committee that an Industrial Survey of the Province should be made. An Industrial Survey may perhaps be best done by one who is conversant with the technique of the industry. All the statistics collected should be analysed and then formulated in a presentable form with reference to every industry.

A survey of the leather and leather goods industry in the Province is absolutely necessary. Statistics regarding these two industries are already being collected for the Leather Committee. But it is difficult to collect these figures easily and readily. It requires a long time—not less than six months to collect the data in all its details. I suggest that, though it may be out of place here, the collection of statistics as is being conducted for the Leather Committee be permitted to be continued. This may form perhaps the first survey of an industry in the Province and may give to the proposed Board of Industries an idea of the manner and kind of data that should be collected with reference to each industry.

APPENDIX XVIII.

(*See* Chapter XV, paragraph 151.)

LIST OF EXISTING PAINT AND VARNISH MANUFACTURERS IN SOUTH INDIA.

1. Messrs. Jyothi Paint and Varnish Industries, Amjikarai, Madras.
2. The Mysore Government Lac and Paint Works, Mysore.
3. Messrs. Hyderabad National Industries, Station Road, Hyderabad.
4. Messrs. Hyderabad Oil and Paint Co., Ltd., Hyderabad.

LIST OF CONTEMPLATED PAINT AND VARNISH MANUFACTURERS.

1. Tiffin's Barytes Asbestos and Paints, Ltd., Cuddapah.
2. Messrs. Addison & Co., Ltd., Mount Road, Madras.
3. The Rayalaseema Paints, Ltd. (Ceded districts).

APPENDIX XIX.

(*See* Chapter XXX, paragraph 300.)

Copy of letter from the Joint Secretary to Government, Development Department, Madras, to the Secretary, Industrial Planning Committee, Kodaikanal, dated 22nd December 1947, No. 8925-P. & D. V/47-1.

[Mines—Minerals—Strategic minerals—Control for development.]

In its preliminary report, the Industrial Planning Committee has recommended: "All strategic minerals, viz., coal, lignite, petroleum, mica, beryl, chromite, ilmenite, sillimanite, manganese ore, monazite, rare earth minerals, all uranium and thorium bearing minerals and piezo quartz, should be wholly left to the control of the Centre for development—Their mining and utilization will be a matter for negotiation between the provinces and states on the one hand and the Central Government on the other."

With reference to this recommendation, I am directed to state that the development of minerals is at present purely a Provincial subject. During 1945 the Government of India intimated that they proposed to undertake certain legislation in regard to control of minerals. In the beginning this Government understood that the Government of India were proposing to take under their control, the development of minerals in Provinces. The matter was considered and a strong protest was lodged against the proposed legislation. It was then pointed out to the Government of India how if the proposals were given effect to, it would hamper industrial progress of this Province. At the same time this Government agreed that the provinces should not develop their mineral resources in a haphazard manner. While this Government welcomed co-ordination at the centre in the form of Central Organization for research, propaganda, technical help, provision of certain rules regulating the conditions of lease, marketing, etc., they were strongly against any central interference in matter of mining and utilization of the minerals found in this Province. In reply the Government of India explained that their proposal envisaged nothing more than what the Government of Madras had themselves indicated as explained above. They also stated that their intention was not to take any executive authority in regard to mining leases or administration but that they proposed to lay down, by central legislation, the conditions under which mining and

mineral development in respect of minerals of All-India importance should take place in this country. They proposed to provide for the regulation of the following matters :—

(1) terms and conditions of leases ;
(2) policy regarding export and internal distribution of such minerals ;
(3) policy regarding monopoly leases ;
(4) manner of regulation where minerals most conveniently workable as one entity fall in several provinces ;
(5) methods of mining and extraction with a view to conserving some of the most important wasting assets of the country.

(i) Letter from the Government of India, Labour Department, dated 17th July 1945, No. M-155 (1) I.
(ii) Madras Government's letter, dated 22nd September 1945, No. Ms. 3636-P & D-III/46.
(iii) D.O. from Secretary to Government of India, Labour Department, dated 13th December 1945, No. M-155 (1).
(iv) D. O. from Additional Secretary to Government, Development Department, dated 13th February 1946, No. 78789-P & D-III/45-1.

Copies of correspondence on the subject noted in the margin * are enclosed for the Committee's reference.

2. The point was stressed by Mr. V. V. Giri, as Hon'ble Minister (Industries), at the Mineral Policy Conference in January 1947. A copy of the proceedings of the Conference and a copy of the Press Note issued by the Government of India as a result of the above Conference are enclosed for the Committee's reference.

3. From the position set out above, it will be seen that the recommendation of the Industrial Planning Committee is opposed to the policy of this Government and is a reversal of the existing division of functions between the provinces and the Centre as explained above. In view of what the Government of India have already stated in the matter, it is unlikely that they will agree to implement the recommendation of the Committee and adopt a mineral policy which may not be uniform in all the provinces. I am therefore directed to request you to place these matters before the Committee for reconsidering their recommendation.

APPENDIX XX.

	Name of members.	*Number of meetings attended by each member.*
1	Sri S. Parthasarathi (*chairman*)	19
2	Sri P. S. Kumaraswami Raja	16
3	Sri R. Suryanarayana Rao	20
4	Sri M. Pallam Raju	19
5	Janab M. Muhammad Ismail	2
6	Sri Rao Bahadur B. V. Narayanaswami Nayudu	12
7	Sri B. S. Sanjeevi Reddi	12
8	Mr. Samuel Aaron	5

Total number of meetings held—21.

APPENDIX XXI.

(*See* Chapter II, paragraph 16.)

MEMORANDUM SUBMITTED TO THE INDUSTRIAL PLANNING COMMITTEE BY SRI R. VENKATARAMAN, M.A., B.L., ADVOCATE, PRESIDENT, BINNY BEACH ENGINEERING WORKS, CORPORATION WATERWORKS. COMMERCIAL EMPLOYEES, RANIPET LABOUR UNION, ETC., AND MEMBER IN CHARGE, TAMIL NAD CONGRESS COMMITTEE, LABOUR DEPARTMENT.

The very constitution of a committee for Industrial Planning solely with representatives of industrialists to the exclusion of representatives of Labour betrays a pathetic faith in the antiquated doctrine that machines produce wealth. The

* Not copied.

growing thought that Industrial relations is a co-partnership of capital and labour and that they are the two legs that sustain the Industry, though slow of acceptance at the hands of the Industrialists themselves is fast gaining recognition at the hands of the Governments as evidenced by the Industrial Conference held in Delhi. It is this old world conception that permeates the preliminary report of the Industrial Planning Committee and diminishes its usefulness.

It is obvious that there can be no Economic Planning at all without a concept of the future of the State. Fortunately for us, the Congress High Command has enunciated in no uncertain terms their objective as progressive realization of a Democratic Socialist State for India. Hence Industrial Planning has to be undertaken in a manner that will fit labour in a Socialistic State rather than with hazy notions of Industrial Democracy adumbrated by T. W. Agar and other apologists of Capitalistic systems of production and distribution.

Symptomatic of the wrong approach to the problem is found in the appalling economic fallacy contained in the following statement in paragraph 49. "But if wage level is sought to be raised still further, the price level must inevitably rise. It may lead to closure of industrial establishments and unemployment. There must, therefore, be sanity in wage demands. We must not forget in a poor country like India, the largest consumers of common goods are poor. The raising of the wage level beyond reasonable limits will only result in the rise of prices of those very commodities which they themselves largely consume." Wage level means the general level of wages in the country, both industrial and agricultural, and certainly not wages in any particular trade or industry. If the wage level increases there will be more purchasing power among the vast majority of the people and thus there will be greater demand (i.e., desire backed by purchasing power) for goods and services. This phenomena instead of leading to closure of industrial establishments, will on the contrary give a fillip to Trade and Industry and bring about a higher standard of living among the masses. The war period affords best proof of the principle stated above. If wages of particular industries are raised beyond reasonable limits, it will no doubt result in the flight of capital from the particular industry with consequential results. But the Committee is not concerned with any particular industry but with industrial planning as a whole. It is therefore regrettable that a Committee of such eminence should have allowed itself to subscribe to a theory which is both economically unsound and politically mischievous.

There are two aspects of Industrial Planning, viz., the 'Short Term' and the 'Long Term' plan. In the short term plan, endeavour should be made to secure the co-operation of Labour and Capital in order to increase production to the common good of all. In the long term plan a permanent solution has to be devised for solving the eternal conflict between Capital and Labour.

No one will deny that we should aim at increasing the real rather than the money wages of Labour. But housing, medical relief, education both adult and elementary, provident fund and sickness relief are properly the functions of the industrial establishments and not the exclusive concern of the State. Establishments engaging over a 5,000 work people should be able to provide for all the above facilities to their men. The Government may levy a cess on smaller establishments and with their own contribution provide all the abovenamed facilities to the workers.

But in order to ensure industrial peace in the short term, the Labour Department should encourage annual contracts between Managements and Labour, and where such contracts are not entered into within a specified date, refer the dispute automatically to an Industrial Court for settlement. If the Industrial Courts are better manned than they are to-day, there is no reason why a large number of disputes should not be avoided. The poor quality of the personnel of the Industrial Courts, inordinate delay in the proceedings, the legalistic approach to what is essentially a human problem and the general bias in favour of sanctity of contracts are some of the reasons which have contributed to the growing distrust among Labour of Industrial Courts.

Similarly all punishments, discharges, dismissals and other grievances of the workers should be capable of being taken to an Industrial Court without intervention of the Government even as a small cause action for Rs. 5 is taken to a civil court. It is my experience that the discharge of a worker is developed into a case of victimization and then failing to secure reinstatement, several other demands are tacked on culminating in a strike. If a machinery could be devised to hear and dispose of all individual grievances of workers, points of difference can be minimized.

It is obvious that there can be no courts without law and unless some principles are enunciated by the Government as their Labour Policy, Industrial Courts must

necessarily give very divergent and even conflicting decisions. In the absence of any such policy towards Labour, the concept of equity varies with the foot of the Industrial Tribunal. As one entrusted with the task of editing and headnoting all the awards of the Industrial Tribunals, I have been struck by the diametrically opposite views expressed by different tribunals on the same point and by the same tribunal on the same matter in different cases. In the interests of industrial peace in the Province for the short term, the Government of Madras should convene a Tripartite Conference of Industrialists, Labour and Government Representatives to hammer out a formula on the following issues, viz. :—

(*a*) Minimum wage ;
(*b*) Constitution of Works Committee ;
(*c*) Povident Fund and other social security measures ;
(*d*) Profit-sharing schemes ;
(*e*) Association of Labour with Managements such as election of workers' directors in the directorate of the company to mention only a few of the more urgent pressing needs.

I would prefer that after providing for a fair minimum to all workers, their additional remuneration should be related to production so as to develop "Stacknovites" among the workers. Perfect attendance bonus, increasing production bonus and schemes for group competitions can be introduced by discerning managements.

Trade unions, unfortunately, have been started in this country by political parties and have not been a result of the growth of Labour consciousness. The political parties that caught the field early have inculcated the concept of classwar rather than that of improving the economic conditions of the workers and of improving the efficiency of the worker. In the result, if any trade unionist should talk to the Labour that they should increase production, he is sure to be dubbed as a 'Betrayer.' I do hope that Trade Unionists will be able to live down the abuse and endeavour to increase the efficiency of the workers if they desire to serve Labour truly and well.

The long term Planning is really the crux of the problem. Labour to whatever school of thought it belongs, Congress, Communist, Socialist or other Internationals are agreed on one thing, namely, the 'Elimination of Exploitation.' The word 'Exploitation' is hereinafter used in its economic sense and not in the demogogic or abusive connotation. Though none, except partisans, accept the Labour Theory of Value, no one can deny that Labour to-day produces value over and above what it gets in return by way of wages and perquisites. The surplus value of Labour really goes to make up the heavy dividends or huge Enterpreneur's profits, Managing Agency commission and so forth. If we are to establish a democratic socialist state, we should so arrange that the surplus value of Labour is either shared among the workers or among the community in general.

I proceed to give hereunder a Blue Print of the organization of industry eliminating exploitation.

All defence, key, heavy and large-scale industries should be state-owned and the profits thereof available to the community in general for all its services, education, medical relief, sick and old age pensions, in short, a sort of "Cradle to the Grave" scheme of social service to be devised. Critics of State enterprise are in plenty and a success here and a failure there will usually be pointed out in proof of their respective view-points. But I am of the opinion that when State takes over all the industries mentioned above, the so-called private talents will necessarily have to seek outlet through State enterprises, and that there will be no dearth of either ability or enterprise. Even assuming that there is a fall in the efficiency of the higher executive and technical personnel owing to the absence of big dividends, it will be more than compensated by the release of the energy and enthusiasm of the vast majority of the labour population which to-day does not exert its best as it has no interest in the industry. The world has not yet realized the potentialities of the common-machine-tool-man and it is not at all unlikely that given the incentive, he may prove to be valuable.

The medium and small-scale industries should be conducted by industrial co-operatives of the Chinese Model. Several workers who together constitute a unit of production should join together and form a co-operative society and divide the surplus profits of their undertaking among themselves. There will be no management which will invest money, draw dividends and reap the profits. The example of a printing press (Indus Company) consisting of the machineman, treadle man, compositor, proof-reader, etc., running a press and appropriating the earnings themselves on an agreed basis is too familiar to need elaboration. All small and medium size industries are capable of being run on industrial co-operative basis.

The advantage in the Indus Co. is that there is no relationship of master and servant and the several artisans constitute a partnership whereat he may join and wherefrom he may withdraw to join other organizations.

The cottage industries, either with or without power, shall be run by an individual working by himself and his family. Innumerable small articles of value as buttons, toys, penholders, electric table stands and what not may be manufactured as cottage industries products. But, under the scheme I have envisaged, no person shall be permitted to employ Labour except on the basis of an Industrial co-operative. If the person who runs the cottage industry wants to expand his business, he can do so only by converting the cottage industry into an Indus Co., and not by employing another man on a wage basis.

Turning to land, I am of opinion that it should be State farmed where the area is large and capable of such production as the " Gigants " of Russia or collectively farmed if the area, location, soil and other conditions would admit only of small scale farming. It is unnecessary to elaborate the point any further as it is beside though allied to the problem.

The financing of the State enterprises may be done by borrowing at fairly low rates as money having no chance of investment in private enterprise will be available cheap.

The financing of the Industrial Co-operative shall be done through Co-operative department with a new and different outlook from the present. A District Industrial Board may recommend Indus Co. for departmental advances, etc.

The problem of Industrial Finance is serious only in capitalistic societies where the conflicting claim of the individual and the State lead to illogical compromises. But in a Socialistic State, the problem of finance will be secondary to the search for and establishment of newer and better industrial units.

I have endeavoured to present only a skeleton of my ideas on the subject and shall be content if it merely provokes thought, though does not commend acceptance.

EVIDENCE GIVEN BY Mr. R. VENKATARAMAN ON 21st JANUARY 1948 BEFORE THE INDUSTRIAL PLANNING COMMITTEE.

Q.—The first point in your Memorandum is that a Democratic Socialistic State will alone solve the labour problems ?

A.—Yes. The evolution of a Democratic Socialist State is the ultimate cure for all labour problems.

Q.—In viewing the future constitution of India, we must take into consideration the present state of administration of the Government ?

A.—Yes. In the Memorandum, I suggested two aspects, the long-term plan and the short-term plan for industrial planning. In the long-term plan, a permanent solution has to be devised to satisfy labour in every respect and see that labour is not exploited by capital. In the short term plan, we must try to increase production by creating interest and enthusiasm in labour. Our view is that there must be scope given to labour for the management of industries themselves by election of their officers, their managers, etc., and then only you can expect industrial peace. My view is that if you really want to establish industrial peace, you must first eliminate all the present difficulties and troubles of labour and then create for them interest in the industry by giving a share in the output.

Q.—Output, you mean profits ?

A.—Yes, after making necessary reductions.

Q.—That is also what the Committee suggested in the distribution of profits. We need not quarrel about the industrial democracy, if it is for a partnership in a larger sense.

A.—This is the best solution. Merely the power given to the workers to frame their industrial unit will pave the way to a large extent.

Q.—Is it your contention that labour should be free from responsibility and only share profits in the co-partnership ?

A.—I do not put it that way. I would say that the management had to give at every stage a share in the management of the business to the workers themselves That is why I suggested in the short-term plan that the Government should come forward with a statement of policy with regard to minimum wages.

Q.—Labour should know the industry from all aspects, is it not ? You call it industrial democracy or partnership in which labour should understand the industry fully and should have a voice in the management. Let us not quarrel about the label. You are agreeable that to-day there is no voice for labour in industries. Is it not necessary that labour should also take the responsibility and share in the management ?

A.—Yes.

Q.—When we say labour, are we to exclude other classes of industrial employees like technicians, operators, etc. ? Will they not come under the category of labour ?

A.—We do not want to exclude them. All of them should co-operate. You must also know that my view is not applicable to the whole labour as I am only representing a part of it. There are Communists who are for excluding these employees.

Q.—There are two aspects ; whether the sharing of responsibility in the management should be placed first or the sharing of profits should be placed first ?

A.—Both should be placed concurrently.

Q.—To-day, is not the labour mostly concerned with the quantum of profits or wages than the question of sharing responsibility ?

A.—Everywhere an endeavour is made to solve the problem from the point of view of immediately satisfying the labour by throwing a few crumbs here and there, and that is how the conciliation boards are approaching the problem.

Q.—If the labour come forward with satisfaction, why should they be given a share in the management ? More or less the labour are concerned with the question of wages and not with the question of responsibility ?

A.—I will explain. The reason is that the labour has been confronted with their immediate problem of wages and that is why it has been placed in the fore-front. I will give you an illustration. In the question of Dearness Allowance for the labour in Type Foundry here, they put forward this thing first. But this is only the first and immediate problem with which they are confronted.

Q.—One immediate problem finds way to another immediate problem ?

A.—It is the duty of the State to come forward with a comprehensive statement of their policy towards labour.

Q.—What would you suggest for sharing the responsibility as a first step and in what manner ?

A.—I don't place that as the ultimate step. That is only one step as far as labour is concerned. The first or the last is the only one step. If you start one specific industry, I suggest to constitute a Works Committee not merely to give advice on the productive side in the particular unit, but also any matter like replacement of machinery, repairs, etc., all these matters should be referred to the Works Committee constituted by equal representatives of labour and management.

Q.—But all these things do not come under such Works Committees as the Industrial Disputes Act does not provide any such thing ?

A.—The Industrial Disputes Act provides for constitution of Works Committee only to alleviate their minimum difficulties.

Q.—Don't you agree that in times of emergency labour should speak with one voice so that the economic condition of the country would be maintained soundly ?

A.—Trade Unionism has been a result of the political agitators, political parties having entered the field with political ideas. It takes some time for them to settle to the actual trade union principles.

Q.—The lack of clear formulation of a policy not merely rests with the Government but also rests with labour and so none is at fault ?

A.—According to me, the Government is more at fault than labour because they have never attempted to take charge of the better element in labour. In labour there is the moderate element, there are extremists and various other elements.

Q.—What is your opinion for tackling this problem ? It is only one of the many problems with which this Committee is concerned ?

A.—The Government must come forward with a clear statement of their policy towards labour and what they propose to do in the first three or five years—I mean the statement about minimum wages.

Q.—How do you like the minimum wages Act ?

A.—The Minimum Wages Act is before the Central Legislature and the Government are not able to say when it will be passed.

Q.—How is that minimum wages to be revised from time to time ?

A.—Minimum wages won't require to be revised at all. It should be revised now and then in accordance with the cost of living.

Q.—The cost of living from 1918—1930 must be compared when there was a serious fall. It is a question of determining the scaling down also.

A.—When we talk of the minimum wage, I mean only what exactly is necessary for a man to keep his body and soul together. He must be enabled to carry on his work enthusiastically.

Q.—The cost of labour is the material factor in the industry ?

A.—Let us have such industries only which can satisfy labour.

Q.—The minimum wage is in accordance with the cost of living. How do you say that it is satisfactory ?

A.—I would only say that the Government must come forward to satisfy labour with minimum needs.

Q.—What would you say about the unemployed labourers consequent on the increase of wages ?

A.—I would like some people unemployed than all people living submarginal life.

Q.—Don't you think that the wages of an industrial labour must have some relation to the minimum wages of the agricultural labour or the wages of other labourers, not organized under factory lines or industrial aspects ?

A.—No, the wages of each unit will be determined in relation to that particular unit or with particular category of unit, viz., textiles or some other similar industries but it cannot be compared with agriculture.

Q.—Does industrial labour form a more substantial population than agricultural labour ? I don't think so.

A.—Industrial labour is equal to agricultural labour. An industrial labourer is the supporter of a family in which some people are agriculturists. If you increase the wages of an industrial labourer, you are also indirectly supporting the agricultural labourer.

Q.—Why do you create the demand in that way ? You can create the demand for goods ?

A.—If you increase the wages, it necessarily means you give greater amount of money to spend on more goods.

Q.—The only quarrel is the wages must satisfy the labourer. Nobody is satisfied with his wages ?

A.—Satisfaction means not mental but minimum physical comforts. I must say that the wages must be determined reasonably to him.

Q.—Then, this might bring up a general level of wages all round ?

A.—I will give you some instances. When the Madras Chamber of Commerce agreed to give 3 annas a point in the cost of living (before it was 2 annas), several other smaller establishments also agreed to give 3 annas. Subsequently, companies like Hoe & Co., by negotiating have agreed to give. It is only with reference to the point the wage level should be raised.

Q.—The most important question is minimum wages should be fixed. Is it not ?

A.—The Government must come forward with the statement of minimum wages.

Q.—Now, there is a proposal to fix minimum wage throughout India. Do you agree ?

A.—No, that won't be correct. That is why the minimum wage bill does provide that the area should be considered.

Q.—I suppose you agree that if the wages are raised, the cost of living will also rise and have repercussions ?

A.—No, it is not so in our country. The increase of wages in one particular industry will not create such repercussions. It may have some in textile industry.

Q.—How to fix the cost of living, if the demand is for higher and higher wages always ?

A.—Higher wages only in relation to the higher cost of living.

Q.—You don't think at present of the higher cost of wages in every department, including the Government ?

A.—On the contrary, it is the higher cost of living that is the cause for demand for higher wages.

Q.—Regarding sharing of profits for wages, what would you suggest ?

A.—(1) The minimum of 3 per cent should be allowed on capital, (2) necessary charges for labour, and (3) whatever is left over should be divided between capital and labour. I also suggest that you should introduce perfect attendance bonus, production bonus and some other incentives.

Q.—Don't you think that some of these industries should build vast reserves ? Then what do you say ?

A.—Yes. On a mutual agreed basis, certain percentage of the gross returns should be set apart for reserves and that should be spent only on the improvement of machinery and should not be converted again into capital.

Q.—Do you agree to an expert body ?

A.—Not necessary, no decision should be allowed to be taken by any expert. It is better to come into a mutual arrangement rather than to leave the decision to an expert.

Q.—Don't you think that 3 per cent is too low ?

A.—Five to six per cent would be better. It cannot be taken as a standard in future, as the conditions are changing.

Q.—What is your opinion about managing agencies ?

A.—I am very strongly of the opinion that the managing agencies should go ?

Q.—Who should come in their places ?

A.—My suggestion would be, just like in insurance companies, there must be a general manager. He would draw salary and have no more influence in the directorate. Managing agencies will have some 18 to 20 companies in their management and they won't pay much attention to any particular company.

Q.—What is your view regarding the managing agents getting commission on the profits. In England, there is no managing agency system at all. A small percentage of profits is reserved for the Board of Directors. They will distribute among themselves. Some of the directors will take some portfolios. Don't you think a share in the profit is necessary for the Board of Directors also ?

A.—That will come only within 3 per cent set apart for them. In Parry & Co., there are directors working on salary. Their salary will be debited to the working expenses. To start with, we can say that the profits may be in the ratio of $\frac{1}{2}$ to $\frac{1}{2}$. This will really create a great enthusiasm in the labour. But when I say this, I am not representing all the labour, but only a section of it.

Q.—You have also suggested in the memorandum that there should be a cess ?

A.—It is very essential to provide workers with amenities and the State should come forward in this respect.

Q.—If the Government were to undertake it, it must be on a uniform basis. But if the company takes up it will not be ?

A.—Yes, I think so.