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Some aspects of organisation and
management of Public Enterprise
with special reference to Electricity
Supply Industry.

by

ABDEL - MONEIM BARAKAT

B.Comm. CAIRO

M.A. ~~PH.D.~~ THESIS

1965

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ABBREVIATION LIST.

E.D.O.	Economic Development Organisation.
B.B.C.	British Broadcasting Corporation.
B.T.C.	British Transport Corporation.
I.R.I.	Istituto per la Ricostruzione Industriale.
C.E.G.A.	The Cairo Electricity and Gas Administration.
A.E.G.O.	The Alexandria Electricity and Gas Organisation.
H.E.P.O.	The Hydro-Electric Power Department.
M.E.D.	Mechanical and Electrical Department of the Ministry of Public Works.
U.A.R.	United Arab Republic (Egypt).
I.C.I.	Imperial Chemical Industries.
N.U.R.	National Union of Railwaymen.
N.U.M.	National Union of Mineworkers.
N.C.B.	National Coal Board.
T.V.A.	Tennessee Valley Authority.
K.W.	Kilowatt.
K.W.h.	Kilowatt hour.
M.K.W.h	Million Killowatt hour.
M.W.	Megawatt = Million watts.
K.V.	Kilovolt.
N.E.D.C.	National Economic Development Council.
U.N.	United Nations.
O.E.E.C.	Organisation of European Economic Corporation.
G.B.	Great Britain.
N.A.J.C.	National Joint Advisory Council.

N.B.E. National Bank of Egypt.

£E Egyptian pound.

£ Sterling pound.

~~/\$~~ American dollar.

Millimes $\frac{1}{1000}$ £E

C.E.G.B. Central Electricity Generating Board.

Piaster $\frac{1}{100}$ £E

B.E.A. British Electricity Authority.

L.P.T.B. London Passanger Transport Board.

T.U.C. Trades Union Congress.

INTRODUCTION.

The increase in the Government's role in the national economy of most countries has increased the importance of public enterprises in recent years. The rising number of public undertakings involves many economic and managerial problems.

The first aim of this study is to investigate some of these problems, to discuss the different views and suggest measures for the solution of these problems. Particular reference is made to the problems of the electricity supply industry.

The second purpose is to compare, as far as the data will permit, the British and the Egyptian methods of dealing with the problems of public enterprises in general and the electricity supply industry in particular. It is important to note that as far as the Egyptian data is concerned, the author has tried several sources. Some of the data received was a result of personal contact, referred to in the study as unpublished data.

It may also be noted that the structure of the Egyptian electricity supply industry discussed in the study was in existence until March, 1964 when the industry was re-organised as shown in Appendix (1). In making a comparison between British and Egyptian public enterprises

it was hoped to find how far experience in one country can be adopted in another.

Lastly, it should be noted that most of the data used in this thesis, was published or received up to the beginning of 1964.

CHAPTER I.

THE STRUCTURE OF PUBLIC ENTERPRISES.

THE STRUCTURE OF PUBLIC ENTERPRISES IN EGYPT.

BACKGROUND.

Many appear to be convinced, that what private enterprises in the Western World accomplished in the nineteenth century, can now only be accomplished by public action. Governments in a large part of the underdeveloped world have acted accordingly in the last two decades. They have adopted and applied policies to promote the development of their economies. Their main aim is to improve the standard of living of the population. The relation of government to business in the process of economic development differs among regions mainly because of cultural and historical differences, but almost everywhere the role of government is large. However, it is necessary to realise that the extension of the scope of state action in the economic sphere is not confined to underdeveloped countries. Even in economically advanced countries, governments are required to outline and execute comprehensive policies involving a considerable degree of direction and regulation of economic activities. The aim of this chapter is to illustrate this fact in two countries: Egypt and Britain.

Intervention by Egyptian governments was known from the ancient days of Pharaohs. As Professor Issawi put it (1)

(1) Issawi, Charles: Egypt at Mid-Century, London, 1954. p.6

"from the time of Pharaohs, through the reigns of the Ptolemies, the Roman and Arab governors, and the Turkish kings and Pashas, all administration was concentrated in the hands of the ruler and a few chosen ministers and no initiative whatsoever was left to the provinces, except during the eighteenth century when Egypt was in effect partitioned into zones of influences among the beys and beudun Sheikhs". The result of this has been greatly to weaken individualistic feelings and completely to suppress the spirit of municipal enterprise. Several milleniums of centralised autocracy have accustomed Egyptians to look to the government to initiate any business whatsoever (2).

In the first decades of the nineteenth century, the state had sponsored the establishment of a number of industries including textiles, shipbuilding and military supplies.

Mohamed Ali, in 1818, embarked a programme of industrialisation including factories of woollen and cotton goods, sugar and glass. Under the system imposed by Mohamed Ali, all profits were reserved by the government. The managers of the factories were for the most part salaried government officials, ignorant and

(2) Issawi Charles: Op.cit, p.7

unenthusiastic about the work they were called upon to do.

Prior to 1930, Egypt was forcefully reminded of her vulnerable position owing to her almost complete dependence on European industries. By 1930, government intervention was obvious in tariff protection combined with the development of basic facilities, particularly transport, municipal water, sanitation and electric power, which proved to be substantial stimulants. One of the outstanding features of governmental action, during 1930, in industrialising the country, was the foundation of Bank Misr. Although this bank was a privately financed concern, it was of a semi-public character. The government co-operated with the bank by placing with it deposits of public authorities and made it governmental agents for industrial credits. It also had to guarantee the deposits of the bank. Also 'The Credit Hypothecaire' was founded by the government in 1932 as a branch of the Agricultural Credit Bank and was made an independent institution in 1935 and put in charge of some of the mortgage debts taken over by the government from other institutions. In 1949 an 'Industrial Bank' was established. Of the capital of £ E 1.5 million, the government subscribed 51 per cent, and banks and other institutions 30 per cent, the balance having been

offered to the public (3).

Until nearly the last decade, there was no striking government intervention. Nearly all the manufacturing enterprises were privately owned. Apart from the demonstration plants in glass-making, furniture manufacturing and food preserving, the major manufacturing establishments wholly owned by the government consisted of the petroleum refinery at Suez, the printing and publishing firms in Cairo. In addition, the government owned and operated a few repair and maintenance shops, which serviced only the state owned enterprises.

It is worth noting, that in 1951 the Central Bank law was issued. Under this law the bank was practically under complete governmental control. The General Assembly chose the members of the Board of Directors. The Governor was appointed by a decree issued according to a proposal of the Minister of Finance, the Deputy-Governor was appointed by a decision of the Council of Ministers on presentation of two Egyptian candidates proposed by the Board of Directors. The General Assembly appoints, in conformity with the provisions of the statutes of the bank, two censors from among the names inscribed on the

(3) Issawi, Charles: 'Egypt in Revolution' An Economic Analysis, London 1963, p.264

The official rate of the £ E in May, 1962 was # 2.30

list of censors approved by the Minister of Finance. Above all, a Supreme Committee, an authority which covers questions of money, credit and exchange, and is composed of the Minister of Finance and Economy as a president and six members, three of them Ministry Officials (4). It is clear from these regulations that the bank was practically under public control.

PUBLIC ENTERPRISES' ROLE IN ECONOMIC DEVELOPMENT.

From 1951 till 1953, participation of the Egyptian Government in the capital of manufacturing enterprises was negligible. Since then up to the present time the Egyptian economy as a whole passed through four main stages:-

1. Development of national resources.
2. Consolidation of national economy.
3. Partial planning.
4. Comprehensive planning. (5)

I am not concerned here with the details of these stages, and the significance of them to the development of the national economy. But what may be of particular interest is the importance of the public enterprise's' role through these stages. This could be made rather clear by giving the examples of the important machinery which carried

(4) Egyptian Economic & Political Review Vol.2. 1955-6 p.38

(5) Hassan, Abdel Razek, A Review of Economic Development Egyptian Political Science Review August, 1963, p.4.

out this responsibility. It may be made clear that public enterprises in Egypt have had a particular feature especially the way of their creation, as we shall see in the second stage after the Suez crisis, when a great number of foreign enterprises were handed over to the government. The incredible number of enterprises affected by the 1961 socialisation laws has no similarity in the world during the sixties. Oscar Lange in his paper 'Economic Development, Planning and International Co-operation' described the role of public enterprises in Egypt during the fifties - 1952 - 1961 - as that it gives a living picture of modern national revolutions which aim at developing society by a method different from the Capitalist method which had been followed by most of the Western Countries after the French Revolution at the end of the 18th Century, and from the Marxist method adopted by the Eastern Countries after the Soviet Revolution at the end of 1917.(6)

The first stage.

The establishment of the National Production Council in January, 1953 is the example in the first stage. The Council was assigned the task of co-ordinating

(6) Oscar Lange: Economic Development, Planning and International Co-operation (Central Bank of Egypt) Economic Bulletin 1961, p.2

the work of the production Ministries and planning the long and short-term production policies. The Council had a large task to carry out, in nearly all spheres of the national economy. In industry the Council had to initiate projects to increase the national output in addition to the aim of increasing output from the existing projects. The industrial sector at that time was unable to perform a leading role in economic development despite the encouragement given in the form of tariff protection, ban on exports and facilities for importing industrial equipment. In agriculture the Council was charged with the study of the plans to increase the cultivable land, irrigation, land reclamation and animal breeding. In addition to these two main sectors, it was the duty of the Council to plan for particular projects, such as the generation of electric power, road construction, prospection for oil and other minerals. Other tasks which have to be mentioned are those relating to the modification of the taxation system in order to raise the necessary amount of capital needed for the construction of new industries. In this respect the Council was authorised to contract local and foreign loans.

How far was this public body successful?

The answer to this question may be in two main parts.

First, as a policy-making body it carried out two functions.

- (i) With a successful investment policy its first budget in March, 1953 amounted L.E. 21.7 million, to be distributed over the years 1953/54-55. The financing was carried out through re-valuation of gold balances and contraction of loans. It also created the 'Agricultural Reform Fund' supplied by revenues obtained from selling wheat seeds, corn seeds and other agricultural activities.
- (ii) It re-organised the management of joint-stock companies to be more effective in consolidating the national economy, which was within the limits of its powers. It limited the number of the Board's members with a maximum of seven members. It was noticed that the large number of directors led to bad management of the activities of those companies and made it difficult for the Board to take quick decisions. (7)

Secondly, as an executive Board, the Council studied and participated in many projects considered to be essential for modern industry, viz. iron and steel, fertilizers, cables, rubber batteries, procelain and ceramics and paper industries. It also contributed in the High Dam

(7) Hassan, A: Op.Cit. p.6

projects in its first stage. In addition the Council supplied for the expansion of the Petroleum Refinery and installed the pipelines necessary for supplying both Cairo and Alexandria. It should be noted that the Council's subscriptions in the capital of these projects was by 51 per cent or sometimes more. (8)

Other public enterprises characterising this period were the State Railways and Government Refinery at Suez. These two organisations were given more autonomy and re-organised as separate entities, with separate budgets and boards of management instead of being managed by government departments.

However, the position of the Production Council changed according to the establishment of the Ministry of Industry and the Planning Commission founded in 1955, but the main duties of the Council were transferred to Economic Development Organisation established in January, 1957. This leads us to the second stage.

The second stage.

The second stage had three main features:-

- (i) The nationalisation of the Suez Canal Company in July, 1956.
- (ii) The Egyptianization of financing organisations, mainly banks and insurance companies.

(8) Issawi, C. Egypt in Revolution 1963. p.65

(iii) The establishment of the Economic Development Organisation.

The Egyptian law nationalising 'La Compagnie Internationale du Canal Maritime de Suez' introduced one of the major private enterprises into the public sector. The administration of the Company was to be governed by an independent Board attached to the Ministry of Commerce. The composition of the Board, and all the relating problems concerning the members were to be decided by the President of the Republic.

Article 1 of the law stated 'La Compagnie Internationale du Canal Maritime de Suez' (Societe Anonyme Egyptienne) est nationalisee. Son actif et son passif reviennent a l'Etat et les Conseils et Comites actuellement charge de son administration sont dissous (Sec.A).

Article 2 stated the 'L'administration du service du trafic par le Canal de Suez sera assuree par un organisme independent qui aura qualite de personne morale: il sera rattache au ministere du commerce. Un arrete du President de la Republique determinera la composition de cet organisme et fixera l'indemnite a server a ses membres. Cet organisme aura tous les pouvoirs necessaires pour diriger le service et ne sera pas soumis a la routine et aux reglements administratifs.

Quoted from 'La Bourse Egyptienne' 27th July, 1956.

The Egyptianization of banks, insurance companies and other foreign trade did not in fact alter the position of these institutions as private enterprises. They had taken the form of Egyptian Joint Stock Companies.(9), but they may be considered as semi-public organisations, for two reasons:-

- (i) The Egyptianization of banks was intended to secure a banking system designed to serve the proper interest of the national economy. Profits will not be the main goal of the Institutions.
- (ii) Most of these banks were practically controlled by the Government-owned Economic Development Organisation, which bought all shares of these banks and managed them with other Egyptian banks recently established, by the E.D.O. itself.(10) Thus the banks and insurance companies which were sequestrated and managed through the E.D.O. may be considered as semi-public enterprises because the Egyptianization procedures caused the emergence of the government as the principal owner of a great part of the banking system.

(9) Law No. 22/1957.

(10) National Bank of Egypt - Economic Bulletin Vol. XIV
no. 1. 1961 p. 34 ~~Cairo~~.

Apart from the obvious reasons for sequestration it was claimed that the direct control of the government over the banking system is crucial. In the newly developing countries the banking systems are characterised with the specific emphasis given to banking to ensure the contribution to the process of development. It may be noted that in some of the advanced countries, major changes have taken place to give the state more control over the banking system to ensure effective integration between fiscal and monetary policies as in France. (11)

Another feature of governmental control on banks was the issuing of the Banks and Credits Law in July, 1957 which determined the role of banks in the national economy, as well as their relations with the Central Bank, which was granted the authority to supervise all the bank's activities and given considerable powers in organising the credit policy.

In addition to the Egyptianisation laws which were promulgated, led to the acquisition by the State of substantial interests in several banks and insurance, commercial and industrial companies, the Government felt that it was necessary to establish a public body to

(11) Einaudi, M., Bye M., and Rossi, E.

control the State's interests in various economic activities. This inclination materialized in the creation of the Economic Development Organisation. The E.D.O. has been the subject of considerable discussion since its inception in 1957. Its inspiration and character give it a position of extreme importance not only as a dynamic economic body, but as an experiment in socio-economics of wide interest.

Its administration and functions have been laid down by bye-law no. 138/1957 - (Appendix 2).

Of particular interest are the following characteristics of this public body.

(1) It has some similarities to the British public corporation. These are:-

(i) Its organisational structure belonged more to the field of independent enterprise with a complete autonomy rather than to the restrictively bureaucratic management of government machinery.

The rules and regulations to be followed in managing the establishment including the financial and accounts rulings are not bound by the government regulations in force. (12)

(12) Article 23 Law No. 138/1957, Appendix (2)

(ii) The Board prepares every year a balance sheet and a profit and loss account. It must also prepare a report of its activities during the financial year and its financial position at the end of the same year. (13)

(iii) The Board of Directors has full rights to manage the work of the organisation. They practice all activities for managing the funds of the organisation and to determine the means of investment. (14) It contracts loans and issues stocks in conformity with the law.

(iv) Nomination of members of the Board, and the fixing of their salaries are by a decision of the President of the Republic as in the case of the Bank of England and the B.B.C. where these regulations are fixed by the Crown.

(v) The E.D.O. is established as a Government agency to participate directly in the national economic planning. It has to carry out the general policies laid down by the planning bodies, as in the case of the British National Economic and Development Council and its relation with public enterprise.

(13) Article 19.

(14) Article 17.

(2) The only difference from the British public corporation is that the E.D.O. is organised as a holding enterprise. It participates in the capital of 57 companies with varying investments.(15) Ten of these companies are wholly owned. Its share in other companies varies between 20% and just less than 100%.

Before the end of the year 1957 the main production sectors of the state were in the hands of Egyptian enterprises supervised by the State.

As the public sector grew further, two other holding enterprises were created, namely Misr Organisation and El Nasr Organisation, besides the general public organisations. These were the main features of the third stage.

The third stage.

The third stage was characterised by the inflation of the public sector in the Egyptian economy. When the Ministry of Industry prepared for the first five-year plan in 1957 the public sector's share in the plan was estimated at about 60% against 40% of the investments in the private sector. In fact that Government decided to carry out the entire plan restricting the contribution of the private sector to less important projects.

(15) See Appendix (3). ~~Article~~

In addition to the public organisation already in existence the Government had set up new public organisations to carry out the plan. The Federation of Industries and Industrial Chambers were revived and their activities were re-organised to participate directly in the development of industries. An Institute of National Planning was founded in 1960 to carry out training and research. The re-organisation of the Suez Canal Authority, the High Dam Organisation and the Petroleum Authority which gave them more autonomy outside the ministerial framework, was also an important feature of this period. In 1960 the Egyptian Government started a new economic policy for economic and social development, i.e. taking the effective steps towards a complete socialist form. It paved the way for it by nationalising Bank Misr and the National Bank of Egypt. The importance of the former nationalisation law was due to the fact that Bank Misr was the largest Bank in Egypt not subject to State control. Its assets amounted to nearly one third of the assets of all other commercial banks, and its control covered a large number of industrial companies, owing to its participation in their working capital and the grant of large credits to them. The National Bank of Egypt was converted into a central bank which

supervised all other banking establishments.

It seems now impossible for the Economic Development Organisation (discussed in the second stage) to carry out all these government commitments. Thus two other public organisations were established, they are the 'Misr Organisation' and the 'El-Nasr Organisation'. The Misr Organisation was established on the 2nd March, 1961 by a Republican Decree No. 249/1961. Its administration and functions can be briefly explained as follows:-

- (i) It is a public economic organisation having an independent entity and attached to the Presidency of the Republic.
- (ii) The capital of this organisation is to be found from Bank Misr Capital and its share in the capital of the joint stock companies, in addition to the capital of other public organisations to be fixed by a Presidential Decree.
- (iii) Its main function is to accelerate the pace of economic development through its engagement in commercial, financial, agricultural and industrial activities, previously carried out by the Boards of Bank Misr Companies.
- (iv) It has to supervise on behalf of the Government all the activities of Bank Misr.

Finally the Organisation has to submit to the President of the Republic, within three months after the end of its financial year, a balance sheet, profit and loss account and a report on its activity during the year. Net profits realised by the organisation will accrue to the Treasury after deductions have been made for reserves or for the execution of new projects.

The El-Nasr Organisation has more or less the same shape and the same functions as the Misr Organisation. The difference is only in the way this body was set up. The El-Nasr Organisation has only been confined in its duties to the industrial projects. It has to carry out the functions of other, preceding companies, set up mainly for the execution of the five-year plan. The capital of the El-Nasr Organisation was formed from the capital of these companies.

Finally the Organisation has to submit to the President of the Republic at the end of every financial year a report on its activities coupled with the balance sheet and profit and loss accounts.

The fourth stage.

In the third stage we have seen that the public sector as well as the private sector were considered as part of a scheme to implement the plan's projects. It

became apparent during the first year of its application that dependance on the private sector and individual incentives would not help the Government to realise its aims because of two reasons:-

- (i) The private sector would prefer the industrial section of the economy rather than other projects which were considered as public utilities.
- (ii) The private entrepreneurs were not willing to give effect to Government Socialist Policy. This being the case, it was considered imperative to adopt straightforward socialist methods, i.e. to nationalise the sources of production and to limit as far as possible the power of privately controlled capital.

During the year 1961 the Egyptian economy was completely reshaped as a result of the overall nationalisation laws which put nearly 90% of the whole economy under state control, including a number of companies in which the Government's share of capital was 50% or more. The wholly nationalised industries were banks and insurance companies, (16) foreign trade, transport and marine navigation, metallurgical and chemical industries and the rest of the public utilities.

(16) Appendix 4.

Those which were partly nationalised included bakery industries, rice and flour mills, dispensing drug laboratories and mining industries.

This situation did not last long, as the partially nationalised industries were fully nationalised by the nationalisation laws issued in 1962 and 1963.

By the nationalisation laws, the public sector had been organised and administered by 38 public organisations with a supreme council for public organisations. (17) Examples of these organisations are many and include:-

- (i) The Egyptian Public Organisation of Banks, following the nationalisation of all banks. The Board of Directors of the E.P.O.B. includes the Chairman of the Board of Directors of the major banks, the Under-Secretary of the Ministry of Economics as well as the Sub-Governor of the Central Bank of Egypt. Technical problems such as the rate of commission and interest etc., were handed to a Technical Committee.
- (ii) The Public Organisation for Internal Transport which superseded the General Road Transport and Construction Organisation and the General Authority for Road Transport Affairs. (18)

(17) Republican Decree No. 1899/1961 - and Appendix (5)

(18) Republican Decree No. 1614/1962.

- (iii) The Egyptian Public Organisation for contracting and construction. Its main function was the execution of various housing and public utility projects, but it was dissolved and replaced by three public organisations, under the supervision of the Minister of Housing and Utilities. They are the Egyptian Public Organisation for Enterprises for Buildings and for Utilities.
- (iv) By virtue of the Republican Decree No. 3317/1962 issued on the 3rd of December 'The Egyptian Public Organisation for Desert Land Reconstruction' was established. The aim of the Organisation is the execution of desert development projects including land reclamation, improvement of means of transport and industrial projects in the area.

In addition to the four examples above we could name the following public organisations: the Egyptian Public Organisation for Mining, Petroleum, Spinning and Weaving, Chemical Industries, Foodstuff Industries, Building Materials and Ceramics, Metallurgical Industries, Co-operative Production and small industries and Engineering Industries.

A Supreme Council for Public Organisations was set up by a Republican Decree No. 486/1961, to supervise and

lay down the general policy of public organisations in accordance with the general plans of the Government. The formation of the Council was determined by law as: The first Vice-President, Chairman and the Ministers of Economics, Agriculture, Agrarian Reform and Supply and six other Ministers as members. Each Organisation has to submit to the Council periodic reports on its activity and a copy of the decisions taken by its Board of Directors, especially the investment policy, regarding the participation of these organisations in the capital of companies and establishment of new companies. Some critics fear that this Council is a step towards a planned economy.

In a reply the Minister of Industry, stated that in our country we have a planned economy, but, the new Council is to form a co-ordinating organisation between the various public organisations to ensure harmony and co-ordination and proper fulfilment of the tasks of these organisations. It is a co-ordinating and pushing ahead organisation for investment in various public organisations. (19)

From this picture of the economic structure in Egypt, serious criticisms may arise, i.e. the implications

of a totalitarian socialistic state, which involves the drastic consequences of the centralisation of planning (20) and the bureaucratic management. (21)

Against these criticisms it could be said that:-

- (i) Egypt is not a totalitarian state in the usual sense because of the important qualification that there is no one party organisation extending to the lower levels of economic and social activity.
- (ii) The advocates of the present system claim that the centralisation of planning expresses a definite policy aiming at putting the reins in the hands of the public sector, which reflects a firm tendency towards direct planning rather than planning through the manipulation of incentives or any other method of individual control. Of course, centralisation of planning has many disadvantages, as it will be mentioned in Chapter V of this study, but if we know that newly created public organisations and the great number of companies brought into the public sector in Egypt after 1961, it may be

(20) See Mason, Edward S., Economic planning in under-developed areas, New York 1961.

(21) Mises, Ludwig von, Bureaucracy, Yale University Press 1944, p.57

desirable to have a uniform policy at least in a transition period.

(iii) As we have seen from the powers and functions of most of the public organisations, some of them have a separate economic entity with boards of management having a degree of discretion in dealing with activities of their organisations.

THE STRUCTURE OF PUBLIC ENTERPRISES IN BRITAIN.

INTRODUCTION AND BACKGROUND.

The aim of this section is to describe briefly the present structure of the British public enterprises. This will give us the necessary comparison with the Egyptian public sector.

It is true that the state intervention in economic activities is to be found not only on the under-developed countries, but also in the advanced countries of the West.

If we take the United States as an example of developed countries we see that at the end of the second World War, the Federal Government had owned a variety of industrial properties. It also from time to time undertakes public projects. The most striking example in the United States is the Tennessee Valley Authority. Other Western Countries bring many examples such as, I.R.I. in Italy, (Salzgitter), in the Federal Republic of Germany and many examples in France.

Both in developed and under-developed countries, the Government's role is based on a national objective with the need for planned and rapid development. Types of industries which are agreed to be under public ownership are classified as industries of basic and strategic importance, secondly, industries of the nature

of public utility services or, thirdly, industries which are essential and require investment on a scale which only the State could provide. Many Governments have gone into fields, which could not have been exploited by private enterprise. It may be claimed that it is difficult to say what is essential or what is of basic strategic importance, and many industries are essential for the national economy. Also many industries could be of highly strategic importance, but public utilities are clearly defined, electricity, gas, water supply, and transport, are examples. Great Capital investment can be found in private enterprises, but the problem is that some industries must wait long enough for profits to occur, and the risk involved is too great for private industrialists.

British Government control over some industries has been applied since the end of the last century. The Electricity Act 1882 laid down that electricity franchises were to revert to the local authorities after a period of twenty-one years. The High Court after 1880 ruled that "telephones were a State monopoly, the Post Office steadily extended its telephone services at the expense of those run by private companies under licence, until in 1912 a nationwide public service had been established. In 1908 a Liberal Government passed the Act constituting the Great

Port of London Authority". (22)

The demand of nationalisation of the industries, which are now nationalised, had been expressed by the Labour Party manifesto in 1914. They pressed for national ownership of the railways and canals, mines and electric power together with the postal and telegraph services. They also demanded the nationalisation of harbours and roads. (23)

During the first World War the British Government controlled the whole of the basic industries, and this was stimulated by the Great Depression of 1929-1932. (24)

In 1945 the Labour Party Government carried out an overall nationalisation programme. This included the nationalisation of the Bank of England, which had the Royal Assent in February, 1946, and of the Coal Industry in July, 1946.

In 1947 Electricity and Transport were nationalised and Gas and Iron and Steel had the Royal Assent in 1948 and 1949 respectively. In addition, it was the intention of the Labour Party to add water supply, all minerals which are not already owned by the public, meat wholesaling,

(22) Hanson, A. H. (ed) Nationalisation, A book of readings, London 1963 p.11

(23) Kelf-Cohen, R. Nationalisation in Britain. London 1961 pp 3-4

(24) Durbin, E.F.M. Problems of Economic Planning 1955 London 1949 p.58

large-scale cold stores, beet sugar manufacturing and refining, cement, industrial insurance and if warranted by further examination, certain sections of the chemical industry. Land could also be nationalised. As "The Government will, as the public interest may require, use its powers to take land into public ownership and put it in charge of the Agricultural Land Commission for expert management. (25)

From the above brief history the following points could be noticed:-

- (i) Public ownership in Britain was known and recognised from the end of the last century.
- (ii) It is wrong to say that only the Labour Party's Socialist policy requires the public ownerships and operation of the basic industries. In addition to the High Court's decision after 1880, which ruled that telephones were a State monopoly and the Port of London Authority Act 1908 by a Liberal Government, Conservative Governments between the World Wars "set up the Central Electricity Board (responsible for the nation-wide distribution of electrical energy through the national grid), the

(25) Lewis, Ben W. British Planning and Nationalisation.
New York 1951 p.42.

British Broadcasting Corporation (with a monopoly of broadcasting services) the London Passenger Transport Board, (which took over all the London Passenger Transport Services previously run by municipalities and private Companies), and the British Overseas Airways Corporation (by merger of the two private companies, Imperial Airways and British Airways. (26)

(iii) British Socialist's nationalisation programme include many industries consisting of a considerable proportion of the national economy.

TYPES OF PUBLIC ENTERPRISE IN BRITAIN.

Three principal forms of organisation are now utilised for the administration of public enterprises. These are (i) Government Departments, (ii) Public Corporations, (iii) Mixed Ownership Corporations.

The public sector in Britain, not only includes these three types, but also some other public bodies with particular functions. For example the Colonial Development Corporation, whose main function is financing private or mixed enterprises, also the Marketing Boards which regulate these enterprises. But the most important feature of British public enterprise is the public corporation, which governs mainly the nationalised

(26) Hanson, A.H. (ed) Op.Cit pp 11-12.

industries. Government departments and mixed ownership corporation have not the same importance in Britain.

GOVERNMENT DEPARTMENT.

The chief example of the Government department, in Britain, is the Post Office. Its control is exercised by a Minister, (The Postmaster General), by permanent officials responsible to him and by the Treasury. The Minister is fully responsible to the House of Commons for the department's activities. In financial matters and its allied subjects, the department is responsible to the Treasury.

Following the report of the Bridgeman Committee in 1932 some important changes has been taken in the department's internal management. The Committee introduced a Board of senior civil servants to modify management by the secretariat. The service was divided into regions which were given a limited autonomy, and other changes were made in the system of accounting and in the form of treasury control. (27) The 1961 Post Office Act, gave much greater freedom of commercial operation. Under this Act the Post Office is no longer required to get specific parliamentary sanction and Treasury approval for all expenditures. (28)

(27) Clegg, H.A. Industrial Democracy and Nationalisation
Oxford 1951 p.38

(28) Dow, J.C.R. The Management of the British Economy
1945-60 Cambridge 1964 p.216

There are also some industrial undertakings run by Government departments, such as the Royal Ordnance Factories and the Admiralty Dockyards. They belong to the Ministry of Aviation and the Admiralty. They have a greater autonomy in operational management than most other sections of Government departments. (29)

MIXED OWNERSHIP.

The British Government has not chosen the mixed ownership method to extend the public sector, i.e. by taking up shares in enterprises organised as limited companies. There are some examples, such as the British Petroleum Company Ltd., The Manchester Ship Canal, and The Agricultural Mortgage Corporation. The purpose of the latter example is to grant long term loans against mortgages of agricultural land and buildings in England and Wales, either to facilitate farm purchase or to finance improvements in farm buildings, electricity and water supplies, drainage and equipment. The funds of the Corporation consist partly of Capital subsidised by various banks and partly of money raised on loan from the Government. The Deputy Chairman is nominated by the Treasury and two other directors (out of a total of eight) are nominated by the Minister of Agriculture. (30)

(29) Hanson, A.H. Op.Cit p.12

(30) Robson, N.A. Nationalised Industry and Public Ownership, London, 1962. p.26-27.

THE PUBLIC CORPORATION.

The characteristic feature of public enterprises in Britain is that most of them are managed by public corporations. It is claimed that it is the best medium of conducting public enterprises.

The creation of the public corporation is associated with Mr. Herbert Morrison when he said in his book "Socialisation and Transport in 1933", that, "we are seeking a combination of public ownership, public accountability, and business management for public ends!" (31)

The public corporation may have different versions or different names. These differences depend much upon the circumstances of its creation, the nature of its work, its constitution, methods of administration and its internal organisation. Public corporations also are different in the extent of their monopoly power. Examples could be clearly seen in the various public corporations managing the British Nationalised industries. The National Coal Board, the Airways Corporations and the Transport Commission have greater powers within their industries than the Gas Council and the Electricity Council. The Gas Council is, for instance, a federal body. On the other hand, whilst the Area Electricity

(31) Morrison, H. Socialisation and Transport, London 1933
p.149

Boards and Gas Boards have a greater degree of autonomy, the Divisional Coal Boards are creations of the Coal Board, and the Transport Executives, though they are appointed by the Minister, have no powers except those granted by the old Transport Commission. Different names of the public Corporations were given to them as Board, Council, Authority, Commission or Corporation. There is no reason given why these names are different. Despite the fact of these differences the public corporation has special characteristics. These are:-

- (i) It is a public ownership, but it differs from the Government Department in the sense that it has the greatest advantage of being free from detailed departmental and parliamentary control.(32)
- (ii) It is not controlled by the ministerial routine or by ordinary company law, but it is created by a special Act and managed by its regulations.
- (iii) These Acts intended to give the Corporation a business flexibility by considering the Corporation as a separate legal entity which can sue or be sued. It can enter contracts and acquire property in its own right.

(32) Clegg, H.A. Op.Cit p.42

- (iv) The public corporation is an independently financed body. It can obtain its funds by borrowing either from the Treasury or from the public and deriving its revenue from the sale of its goods and services.(33)
- (v) Employees or workers are not Civil Servants. They are recruited and remunerated on terms and conditions which the public corporation determines. Finally, the British public corporation has a complete autonomy in concluding its day-to-day affairs, and it is expected to behave commercially in very much the same way as a private company. This, of course, is a controvercial issue, as it will be discussed below.(34), but external policy is practically under a wide supervision from the Minister concerned. Every industry or group of industries are supervised by a Minister. For example, the Minister of Transport supervises the transport industry, the Minister of Aviation supervises Civil Airways, and the Minister of fuel and power supervises coal, gas and electricity.

(33) This has been changed considerably, See Page 247

(34) See Page 140

NATIONALISED INDUSTRIES IN BRITAIN.

To complete the picture of public enterprises in Britain there should be a reference to the structure of some of the nationalised industries, because of their major economic importance. More details will be given about the Electricity Supply Industry.

1. THE BANK OF ENGLAND.

The Bank of England is an ancient chartered corporation. It has a position of great power and importance, and engaged in close and frequent relation with the Treasury and the Chancellor of the Exchequer.

The constitution of the Bank's Board of Directors and their appointment is different from most of the Nationalised Industries. The Board consists of a Governor, Deputy Governor and sixteen directors, appointed by the Crown. In practice the appointment is made by the Chancellor of the Exchequer. The main functions of the Bank are, managing the national debt, and directing the Government finance and its relation with the money market. It issues notes for the Treasury. It is the Government's main tool of controlling employment policy. This is emphasised by an effective control of currency and credit. Further it acts as a banker of the Commercial Banks.

2. THE COAL INDUSTRY.

The Coal Industry has a long history of state intervention. Legislations were put down to safeguard lives, health and well being of the miners, to prevent women and children from working underground and to limit the working hours of men in the pits. Despite state legislations, the Coal industry was in a desperate position. There was always an acute shortage of investment, technical ability and poor management. Nationalisation of coal in 1946 was a necessity for these reasons and the re-organisation of the industry into larger units which would enjoy the benefits of large scale production. Thus after nationalisation special Committees were appointed to choose the best form of organisation and management of the industry.

At present the industry is organised and managed by five levels of management. These are:-
The National Coal Board (as headquarters), Divisional Boards, Area, Group and Colliery. The original National Board - from 1947 - 51 - consisted of a Chairman, a Deputy Chairman, and seven other whole-time members. The Second Board 1951 - 55 - following the Coal Industry Act 1949 increased the maximum size

of the Board to twelve members instead of nine, provided that not more than eight should be full-time. In 1953 the Fleck Committee was appointed to report on the organisation of the industry. In accordance with the Fleck recommendations the third Coal Board consisted of the Chairman, Deputy Chairman, six full-time members and four part-time members with a total of twelve.(35) The main function of the National Board is to give general directions to other levels in the industry. Divisions are run by divisional boards; Areas, Groups, and Collieries are managed by general managers.

The maintenance of the industry is carried out by specialised departments; these are Production, Marketing, Carbonization, Purchasing and Stores, Industrial relations, Staff, Scientific, Medical Services, Finance, Reconstruction, Secretaries and Legal. It is not necessary to find all these departments at each level of management.

THE GAS INDUSTRY.

The gas supply industry prior to nationalisation consisted of a great number of municipal undertakings and commercial companies. There were in 1948 some 680 statutory undertakings, about two-fifths belonging to

(35) Report of the Advisory Committee on Organisation, National Coal Board Feb. 1955. para. 67

local authorities and three-fifths under private ownership, in addition to a number of small non-statutory companies. This resulted in the inefficiency of the industry as a public utility. The forms of organisation were not suited to the prevailing conditions and less likely to meet the needs of the future. The proper solution to overcome this difficulty was to organise the industry under one national undertaking. The nationalisation of the gas industry in 1948 came to achieve this aim. The Act provided a structure of twelve Area Boards and a central Gas Council. The Area Board consisted of a Chairman, Deputy Chairman and from five to seven members. They are appointed by the Minister and chosen as persons appearing to him to be qualified as having had experience of and shown ability in gas supply, local government, industrial, commercial and financial matters, applied science, administration or the organisation of workers.

The functions of an Area Board are to manufacture and acquire gas in bulk and to maintain an efficient and economical system of supplying gas for its area. The Area Board has to satisfy as far as it is economical all reasonable demands within its area. An Area Board can also develop and maintain efficient methods of

recovering by-products including coke and selling them, as well as providing gas fittings for hire.

The Area Gas Board is treated as a separate financial and managerial entity.(36) The Gas Council is very largely a federal body. It is composed of the Chairmen of the twelve Area Boards. The Council acts generally as the advisor of the Minister in questions affecting the gas industry. It is its responsibility to negotiate with trade unions in labour affairs. It is also the central financial body. The Council can act on behalf of some of the Areas with the consent of the Boards concerned, and interfere with the affairs of any board which fails to meet its commitments.

TRANSPORT.

Transport in Britain has also a long history of State intervention. Under the 1921 Act the railway companies were amalgamated into four main lines. The Road Traffic Act of 1930 regulated motorbus and motor-coach services, and the Road Haulage industry was brought under State regulation in 1933. The London

(36) It will be shown later in the study that Areas Gas Boards enjoy much freedom in dealing with their activities than most of other British nationalised industries.

Passenger Transport Board was established in 1933 to co-ordinate transport facilities in the London region. During most of the Second War the railways were operated under the supervision of the Minister of War Transport acting through a railway executive committee.

The nationalisation of transport was introduced by the 1947 Act which transferred most of the transport system to public ownership. This comprised railways, long distance road haulage industry, passenger road services, canals and inland waterways and the London Passenger Transport Board. The Transport Act, however, provided two types of organisation:-

- (i) The British Transport Commission, with all assets acquired vested in it. "Its general duty was to provide or service or promote the provision of an efficient, adequate economical and integrated system of public inland transport and port facilities in Great Britain, for passengers and goods with due regard to safety of operation.(37)
- (ii) The actual management of the several transport services was placed, by the Act, in the hands of five **Executives**. These were Railways, the

(37) Clegg, H.A., and Chester, T.E. The future of Nationalisation, Oxford 1953, p.92.

the Docks and Inland Waterways, the Road Transport, the London Transport and Hotels Executives. Each consisted of four to eight members. In fact it was left for the Minister to fix the number and names of the Executives after consultation with the Commission, but the Act stated that unless the Minister makes different provision there must be Executives for the railways, docks and inland waterways, road transport, London Transport and hotels. (38)

An important change in the structure of Transport in Britain has been introduced in the 1953 Act. The constitution of the Transport Commission had to be increased from nine to fifteen members, two of whom must be appointed after consultation with the Secretary of State for Scotland. Also the duties of the Commission were substantially changed. Instead of providing an adequate, economical and properly integrated system of inland transport and port facilities, they had to provide railway services, a co-ordinated passenger transport system for London and such other transport services and canal facilities as the Commission considered expedient and port facilities. (39)

(38) Transport Act, 1947 Part(I)Section 5(3).

(39) Public Administration; The Transport Act 1953 Vol.31
1953 p.401.

The other main feature in the 1953 Act was the provision for and re-organisation of the railways. A scheme had to be prepared by the Commission which should include:-

- (a) the abolition (if it has not already been abolished) of the Railway Executive.
- (b) the setting up, for such areas as may be specified by or under the scheme of such authorities as may be so specified.
- (c) the delegation to those authorities of such functions of the Commission relating to that part of their undertaking as may be so specified in relation to these authorities respectively and
- (d) the compilation and publication as respects each of those areas of such statements of operating costs and such statistics as may be so specified.(40)

The main reason for this radical change in the organisation of railways was that it had been much criticised as over-centralised. However, the Railway Executive was abolished and Area Boards were appointed by the Commission. Policy and management functions

(40) The Transport Act 1953 Sec. 16.

were delegated to them under the scheme explained above.

The Government in the 1960 "White Paper" found that the activities of the B.T.C. were so large and diverse that it was impossible to run them effectively as a single undertaking.(41) Thus the Government decided to replace the British Transport Commission and the existing organisation by a new structure designed to overcome the main deficits and disadvantages of the present organisation.(42)

Under the 1962 Transport Act the B.T.C. was dissolved and replaced by five statutory bodies, four separate boards, each responsible for a single principal activity - railways, London Transport, docks and inland waterways - and a Transport Holding Company for the remaining activities of the Commission's undertakings.(43)

Each Board and the Holding Company is made directly responsible to the Minister of Transport. The Minister appoints the Chairman of each Board and also the members after consultation with the Chairman.

With regard to the railways the administration is placed in the hands of the Railways Board and six Regional Boards to which the Railways Board delegates

(41) Re-organisation of the nationalised transport Cmnd. 1248 1960, para.9.

(42) *Ib.id.* para 2.

(43) Transport Act 1962 Part (1) Sections 1 and 2.

certain functions of management.

Ownership and management of other undertakings are exercised by the respective Boards.

CONCLUSION.

It may be seen from the history of public enterprises in Egypt and Britain that Government effective control over essential industries in Egypt is as recent as 1956 and mass nationalisation took place in 1961 only. In Britain Government legislation on essential industries was effectively laid down much earlier than in the Egyptian case.

It is only in Egypt that some of the public enterprises were owned, before nationalisation, by foreign companies. The chief examples are the Suez Canal Authority and a great number of commercial banks and insurance companies.

However, the main reasons for nationalisation of some enterprises in both countries were very similar. It is claimed in both countries that the present public enterprises were formerly in a difficult financial situation and run by bad management. Under the present structure of public enterprises in both countries the following points could be noted:-

- (1) The structure of some Egyptian public enterprises is to a great extent similar to the structure of the British public corporations. Examples are the State Railways, the Government refinery at

Suez and the E.D.O.

- (2) In some Egyptian public enterprises there is a statutory relationship between the enterprise and the President of the Republic. In Britain similar cases are found in the Bank of England and the B.B.C. In each case the Crown appoints the members of the Boards. In practice it may be said that while in Britain Ministers concerned appoint the members, in Egypt it is likely that the President of the Republic has a personal say in these appointments.
- (3) The number of public enterprises in Egypt is much greater than in Britain. This is probably due to the ineffective role of private enterprise in Egypt in the national development. In addition it is recognised that in a developing country the Government should participate a great deal in establishing and conducting many enterprises which in Britain could successfully be managed by private entrepreneurs.

Lastly, it has been shown that there are few examples of British public enterprises dealing with finance, such as the Colonial Development Organisation and the Bank of England. In Egypt the whole financial system, i.e. Commercial Banks and Insurance Companies, are owned and operated by public organisations.

THE STRUCTURE OF THE ELECTRICITY SUPPLY INDUSTRY

A comparative study between the present structure of the industry in Britain and the United Arab Republic.

BACKGROUND.

From the early days of using electricity both governments recognised that electricity had a great role to play as a form of power and that it should be under State control.

In Britain, Parliament had first attempted in 1882 to regulate the industry. The 1882 Act gave the companies franchises for twenty-one years, at the end of which the local authority could buy them out on favourable terms. The 1889 Act lengthened the period to forty-two years, because twenty-one years proved too short.

As a result of the First World War, it was clear that the industry needed an urgent re-organisation. Thus the industry was investigated from the standpoint of the economical use of fuels by the Committee on the Conservation of Coal (1917), and the Committee on Electrical Trades (1917) and the Electric Power Supply Committee (1918). The purposes of these committees were to consider and report the necessary steps to be taken

to ensure an adequate and economical supply of electricity to various classes of consumers. The first step of controlling the industry by a co-ordination of six hundred separate monopolies was the establishing of the Electricity Commission in 1919: it was a central body which consisted of technical experts. Its main function was to regulate and supervise the electricity industry. The commission found that private enterprise and municipal undertakings were very difficult to persuade into joint schemes. Then the Weir Committee of 1926 was appointed to investigate the situation of the industry, its recommendations were embodied in the Electricity Supply Act 1926. Following this Act the Central Electricity Board came into being in 1927. The main purpose of the Board was the establishing of the Grid i.e. the interconnecting of the stations to generate electricity at a standard frequency. Although ownership and management of generating stations remained with local authorities and the companies concerned, the main functions of the Board were to control production, purchase the authorities output and sell it to the distribution authorities. The Board also planned the development of the system in co-operation with the

undertakings and gave technical approval to the power station projects planned by the authorised companies. The main difficulty of the Board's power was that the lack of control over the retail distribution resulted from the existence of various other authorities whose functions overlapped with those of the Board. The need for improvement of this anomalous position was considered by the McGowan Committee Electricity Distribution 1936. The Committee recommended the adoption of one or other of the following alternatives:-

- (1) Immediate and complete re-organisation on a regional basis under public control, by the setting up of regional boards which would buy out all the existing undertakings.
- (2) The retention and utilization, where possible, of the larger and more efficient of the existing undertakings, (both public authorities and companies) and the absorption by such undertakings of the smaller and less efficient undertakings.(44)

In fact, no action was taken on this Report (45) and so the situation was not changed until the

(44) Report of the Committee on Electricity Distribution, May 1936, para.88.

(45) Robson, W.A. Op.Cit p.36.

nationalisation of the whole industry in 1947. The Act of 1947 set up the British Electricity Authority as a national organ and fourteen Area Boards. The Board of the Central Authority composed of twelve members. Four of them were Area Boards Chairmen serving in rotation, three being drawn from outside the industry, the Chairman of the North of Scotland Hydro-Electric Board, the Chairman and the two Deputy Chairman of the Authority and the member responsible for labour relations and welfare. The main functions of the British Electricity Authority set out in the Act were to maintain an efficient, co-ordinated and economical system of electricity supply, and by providing bulk supplies of electricity to Area Boards. The Authority had sole responsibility for the generation of electricity in the power stations and for the operation of the national Grid. In addition it controlled the general policy of the whole industry.

The Act established fourteen Area Boards, covering England, Wales and the South of Scotland. Each of these Boards consisted of a Chairman and Deputy-Chairman, who were full-time members and from five to seven part-time members, one of whom was the Chairman of the Area Consultative Council. The Area Boards were

responsible for distribution of electricity to various consumers in areas determined by the then Minister of Fuel and Power. Each area covered something like three of four counties. Because they were large organisations so Headquarters could only handle general questions of policy. They were divided into departments, each headed by a chief officer. The usual pattern was:- Chief Commercial Officer, Chief Engineer, Chief Accountant, Secretary and Purchasing Officer. Areas were divided into five or six Sub-Areas each under a Sub-Area manager which had an organisation more or less similar to that of the Board itself. Below Sub-Areas the Districts which did not necessarily possess a District Manager. If there was no District Manager responsibilities were divided between the District Commercial Officer and the District Engineer, who can turn to the Sub-Area Organisation for guidance.

Also, fourteen Generating Divisions had been established by the Central Authority within areas corresponding roughly to the areas of the fourteen Area Boards. These Divisions, each under the direction of a Divisional Controller, managed the power station and the section of the Grid which comes within their areas. Each Division was responsible for supplying

electricity from the power stations and the Grid Centres to the corresponding Area Board for distribution. The Divisions varied in size. Each Divisional controller was assisted in the engineering side by five engineers responsible for operation, construction, transmission, on the technical matters and system operation. On the administrative side, he was assisted by a Secretary, Accountant and in some cases by a Purchasing Officer.

The Act also established, like other nationalised industries, consultative councils whose main function was to represent the interests of the consumer.

In Egypt the electricity supply industry was regulated by state rules from the early days of using it. Later in the last century electricity was supplied to cities and towns mainly by private foreign companies. They were subjected to the regulations of the concessions given to them. The main items of these concessions were the period which the company may stay in the country and the areas which would be supplied by them. The French Lebon Company had the first concession to produce and distribute electricity to the various consumers at Cairo and Alexandria in 1892 and 1893 respectively. By 1903 seven other settlements possessed power stations and

could distribute electricity within their administrative boundaries. These were in chronological order; Mansura 1899, Tanta 1901, Suez 1902, Ismallieh 1903 and Port Said 1903.

Concessions given to these foreign companies varied in their period of operation. The majority of them were taken over by the Government in the early fifties, others, such as the Lebon Company of Alexandria was nationalised as recently as 1961. The main reason given regarding the first case was the grave situations of these companies in running the industry. These companies were neglecting the necessary maintenance and repairs of power stations which resulted in the cutting off of the current many times. In addition to the fact that these companies were avoiding any modernised methods in supplying electricity.(46) However, these companies were handed over to either local municipalities or Government departments. Companies which were not taken over had been regulated by special agreements with local authorities, providing for the supervision by those authorities. Example of these cases is the Lebon Company in Port Said which supplied the city under the agreement with the local authority, which was to be ended after 15 years of operation.

46. Abdul Aziz, Ahmed. Electrification of Egypt, Cairo 1955 page 76 (in Arabic).

The management of these public authorities did not give a successful result. The scheme developed very slowly. The routine of the civil service was the main deficiency of managing such a commercial business as the authorities were considered to be branches of the Ministry of Public Works.

Because of the desperate situation of the industry economists were strongly in favour of nationalising the industry. They put forward the following suggestions:-

First, the interconnection of all power stations in the country either thermal or hydro-electrical into one network. By such interconnection the Government would be easily able, through a central body, to transmit power in bulk to the municipalities in the Governorates' Capitals and other cities or towns. These municipalities in turn could sell in retail to different types of consumers.

Second, as the Government would control electricity generation, so they could distribute power as they think in the national interest. An example was put forward whereby a bulk supply tariff would guarantee the standard of tariff which suited the standard of living. It was noted that there were great differences in retail tariffs fixed by the private entrepreneurs.

Third, it was known that, when generation of electricity was in private hands, large industrial companies were obliged to establish their own power stations to avoid the monopolistic effect of private companies. It was estimated that some of these industrial firms had been charged with about 20 per cent or sometimes 30 per cent of the capital to construct a private power station. Thus, it was claimed that nationalisation would give these industries the privilege of taking the power they needed from the general network in reasonable tariffs.(47)

After this argument, the Government took a practical step in controlling the industry by establishing the Electricity Commission in 1954.

THE ELECTRICITY COMMISSION.

The Electricity Commission was established in 1954, as a Government Department acting as a central authority. Members of the Board, employees and workers were civil servants. The Board of the Commission consisted of a Chairman and six full-time members appointed by the Minister of Public Works. Their appointment was subject to a Cabinet Sanction. The appointment of employees and workers lay within the

(47) Abdel Aziz, Ahmed. Op.Cit. p.76

Board's discretion except the Secretary General who was appointed by the Minister.

The commission was divided into three main departments, Administrative, Secretarial and Technical, with each department under a Chief Officer. In addition, the commission had the right by law to establish regional organisations anywhere in the country to carry out its duties. It had also the right to set up sub-committees permanent or temporary to assist in actuating responsibilities.

The primary functions of the commission were:-

- (1) to distribute the power in bulk from all power stations in the country, considered as one unit, to all undertakings.
- (2) to plan the electrification schemes in Egypt and to supervise their execution.
- (3) to construct the general networks and interconnect both the existing power stations and those to be built throughout the country.
- (4) to examine, continually, the existing power stations and to select the most economic ones to connect with the general networks.
- (5) to approve the application, from municipalities and private companies, for the establishment of

new power stations. It defines the conditions which must be followed in designing any new power station and it has the right to prohibit any of them being built unless these conditions are carried out.

- (6) to scrutinize bulk and retail tariffs, and to study other tariffs made by different municipalities before approval.
- (7) to supervise fuel consumption to ensure economic usage of fuel.
- (8) to state the technical requirements for generation transmission and distribution.
- (9) to supervise the contracted concessions of electricity supply still in existence.
- (10) to lay down the conditions and technical specifications for the establishment and usage of any electric equipment in factories, houses etc., in order to secure the safety of people from electricity hazards.
- (11) With respect to hydro-electric power projects, the Commission had the sole responsibility to undertake these projects.

(12) to apply to the Treasury for its capital programmes, Treasury Advances or the issue of public loans. Details of these loans should be approved by the Minister of Finance and Economy and the Cabinet.

As a Government Department, the Commission was obliged to submit its budget for planned projects and other administrative expenditure for approval by the Cabinet and Parliament. Lastly the Commission had to submit an annual report for its activities to the Minister of Public Works.

Egyptian Electricity Departments will be discussed below in the present structure because they were not re-organised.

THE PRESENT STRUCTURE IN BRITAIN.

The present structure of the electricity supply industry in both countries was a result of many enquiries and investigations.

In Britain, the Herbert Committee was appointed in 1954, by the Minister of Fuel and Power to "enquire into the organisation and efficiency of the electricity supply industry in England and Wales, and made its recommendations." These gave use to the Electricity Act 1957 which established the present organisation.

Accordingly the statutory bodies controlling the electricity supply industry and covering England and Wales are the Electricity Council, the Central Electricity Generating Board and twelve area boards.

THE ELECTRICITY COUNCIL.

The Electricity Council consists of the Chairmen of the Area Boards, the Chairman of the Generating Board and two other members designated by that Board, and in addition independent members who are the Chairman, two Deputy Chairmen and one other whole-time member plus one or two part-time members.

The Council serves as a central organ for the electricity industry in England and Wales with the purpose of consultation and formulation of the general policy. The main functions of the Council are:-

- (1) It is the advisor of the Minister on all matters affecting the industry.
- (2) The Council assists the Generating Board and Area Boards in developing and maintaining their programmes to ensure an efficient co-ordinated and economical system of electricity supply.
- (3) It performs services for, or acts on behalf of Electricity Area Boards with respect to matters of common interest of those Boards.

- (4) It is the Council's responsibility to establish and maintain;
- (i) negotiating machinery for settling disputes and specify conditions of employment throughout the industry and
 - (ii) machinery for joint consultation, to promote, improve and encourage measures affecting the safety, welfare, education and training of employees in the industry and to provide for the discussion of the matters of mutual interest to the Council or Boards and their employees.
- (5) to undertake the finance of capital programmes and development, the publication of consolidated accounts and carry out programmes of research.
- Finally, the Council has to prepare an annual report reviewing the activities and progress of the industry as a whole.

THE CENTRAL ELECTRICITY GENERATING BOARD.

The Generating Board was created by the 1957 Act. Its main function of generating and transmission was transferred by the former British Electricity Authority.

The Board consists of a Chairman and not less than seven or more than nine members, one or two of the members are Deputy Chairmen, all appointed by the Minister.

The Board's responsibility, stated by the 1957 Act, is to develop and maintain an efficient co-ordinated and economical system of supply of electricity in bulk to the Area Boards. For that purpose the Board has to generate or acquire supplies of electricity to be acquired in turn by Area Boards, for distribution to various consumers in England and Wales. The Generating Board, plans the provision of new generating and transmission plant, and it is responsible for the construction and operation of generating stations, and the main transmission system known as the Grid. For the implementation of such plans, the Board's territory is divided into five operational Regions - North Eastern - North Western, Midlands, South Eastern and South Western - each region being managed by a Regional Executive Committee which is responsible for the operation of the power stations and transmission system in their areas. Four of the five Regions are sub-divided into Divisions each in charge of an Assistant Regional Director.

Major construction projects are in charge of four Project Groups. Three of these Groups deal with the construction of power stations, the fourth with transmission problems. The structure of the Board

contains also special committees for particular purposes. For example the Steering Committees which were established to re-inforce co-ordination of engineering and scientific research especially in the nuclear generation stations environments. The Headquarters Transmission Design Branch organised into three separate branches individually responsible for the development of plant design and system design. There are also special committees responsible for the welfare, safety and health of employees, such as the Medical Advisory Committee composed of the five regional medical advisors and Headquarters medical specialists under the Chairmanship of the Chief Personnel Officer. The Committee is responsible for medical matters of concern to the whole of the Board's organisation.(48)

AREA BOARDS.

Area Electricity Boards in the present structure have been reduced to twelve instead of fourteen. This was a result of the Re-organisation (Scotland) Act in 1954 which abolished two of these Boards served the South of Scotland.

(48) Central Electricity Generating Board Annual Report and Accounts 1962 - 63 para 328.

Either the Area Boundaries or their internal organisation have remained unchanged since the industry was nationalised, but the 1957 Act introduced a number of new provisions and conferred additional powers and duties to Area Boards.

The present Constitution is that each of the twelve Boards consists of a Chairman and not less than five or more than seven other members, in addition, the Chairman of the Area Electricity Consultative Council is ex-officio a member of the Area Board. The Area Boards are now required to purchase bulk supplies of electricity from the Generating Board and carry out the efficient distribution. The Area Boards have also had since the 1957 Act the power to generate themselves with the approval of the Minister.

THE PRESENT STRUCTURE, IN EGYPT, UP TO MARCH, 1964.

The structure of the Electricity Supply Industry in Egypt (up to March, 1964) has been re-shaped several times according to changes in political conditions and the socialist laws in 1961.

Before 1961, there were three main authorities undertaking the supply of electricity in the country. These were the Egyptian Electricity Commission, a number of Government Departments and some private enterprises.

The socialist laws of 1961 abolished completely all private enterprises dealing with electricity. The Egyptian Electricity Commission was re-organised under the name of U.A.R. Electricity Commission. Government Departments have not been changed. Most of these Departments related to the Ministry of Public Works, others are branches of different Ministries.

This situation was still in operation until the creation of the Ministry of Electric Power late in 1964.

Because of the lack of published data about the new Ministry our discussion will be mainly on the structure which was in existence first before the creation of the Ministry of electric power.

Beside the U.A.R. Electricity Commission which served more or less as a central authority, there are five other Government Departments. Namely:-

- (1) The Cairo Electricity and Gas Administration (CEGA)
- (2) The Alexandria Electricity and Gas Organisation (AEGO)
- (3) The Hydro-Electric Power Department (HEPO)
- (4) The Mechanical and Electrical Department of the Ministry of Public Works, (MED)
- (5) The Mechanical and Electrical Department of the Ministry of Housing and Public Utilities.

These authorities supply all types of loads over the country, such as domestic uses, irrigation and drainage pumping stations, industrial plants, public utilities and traction.

U.A.R. ELECTRICITY COMMISSION.

The U.A.R. Electricity Commission came into being in 1959 after the re-organisation of the old Egyptian Electricity Commission in 1954.

The new Commission was established, as a Government Department by a Presidential Decree. The Decree appointed the Minister of Public Works as the Chairman and having as members:-

- (1) Directors of the power producing Departments of the Ministry of Public Works, the Ministry of Housing and Public Utilities.
- (2) The Deputies of the Ministers of Public Works, Treasury, Communications, Industry and Public Utilities.
- (3) The Director of the Railways organisation.
- (4) The Director of the Electricity Department of the Ministry of Planning.
- (5) The legal Councillor of the Ministry of Public Works.
- (6) The President of the Organisation of Chemical Industries.

The new Commission was faced with new duties to carry out in addition to those stated in relation to the old Egyptian Commission. These duties were necessary because of the growing industrial sector in the country and the first five year plan. These responsibilities are:-

- (1) Planning the electrification and the promotion of electrical energy utilisation in the U.A.R.
- (2) Proposing the electrical projects to be executed either by the different electricity authorities or the new industrial public organisation.
- (3) Giving advice to the electrical power organisations concerning the selection of the best tenders for the construction of generating stations, transmission lines and substations of voltage higher than 66 kv.
- (4) Assisting the electricity organisation in financing the new projects of the five year plan out of its budget.
- (5) Studying electricity supply tariffs and proposing changes.
- (6) Collecting data and information on electricity and the preparation and study of the accumulated statistics.

The Commission is divided into three main departments; Administrative, Secretariat, and Technical. The latter, as it is called the Technical Bureau, is headed by the Secretary General of the Commission, and it is responsible for technical problems of the industry. For example, it is entrusted at present with the planning and execution of the High Voltage interconnection system and the construction of some generating stations and distribution lines.

EGYPTIAN ELECTRICITY DEPARTMENTS.

There are five main Government departments which generate and supply electricity in Egypt. In contrast with the British Electricity Area Boards, the functions of each of these Departments are widely different. For example the C.E.G.A. and the A.E.G.O. supply all types of consumers in their respective areas. But the Mechanical and Electrical Department of the Ministry of Public Works supplies only the electrified irrigation and drainage stations in the country.

There are two Ministries with the function of controlling the industry. First, the Ministry of Public Works and second, the Ministry of Housing and Public Utilities. There is no evidence of co-ordination between the two Ministries. However, the former controlled three

Departments, the C.E.G.A., the M.E.D., and the H.E.P.D. and the latter is in charge of the A.E.G.O. and the M.E.D. "of the Ministry of Housing and Public Utilities."

The first three Departments are:-

1. Cairo Electricity and Gas Administration.

It is a Government Department supplying the city of Cairo and some of its suburbs including the industrial areas at Helwan and Abu-Zaable. It is the largest electricity organisation in the U.A.R., serving more than 3.5 million people. Originally it was a private company owned by the French firm Lebon which had supplied most of Cairo for about 42 years. The Government took over all the company's power stations at the end of 1947 and have since operated the organisation through this Department. Under Law No. 145 - 1948 and its amendment by Laws No. 384 - 1953, and 404 - 1954, the internal organisations and the functions of the Department were laid down. (49) The Administration of the Departments is the responsibility of the following authorities.

- (A) The Board which is responsible for running the organisation according to the administrative and financial legislation followed by the ordinary Government Departments, except when

(49) Appendix (6) shows a chart of the Organisational structure of the C.E.G.A.

it is specifically written down by its governing laws. The main functions of the Board are:-

- (a) planning for supplying electricity requirements in the area for every five years ahead.
 - (b) the sanction of the annual budget estimations before submission to the Minister.
 - (c) the suggestions of property sequestrations for the national interest.
 - (d) the fixing of prices to different authorities and consumers for every five years subject to any modifications during this period.
 - (e) the contracting for selling and buying electricity to and from other authorities.
 - (f) the sanction of other contracts valued more than £E1,000.
 - (g) the Board lays down the internal legislation in the organisation and also all matters affecting wages and salaries of the workers and employees in the organisation.
- (B) General Manager who is responsible for managing the Organisation and dealing with many of the day-to-day affairs. Some of these functions are:-

- (a) the appointment and the exceptional promotion of employees up to a certain grade and the transfer of any of them.
 - (b) all other problems of employees such as holidays and punishments.
 - (c) it is his responsibility to deal with commercial and financial problems not within the responsibilities of the Board.
- (C) Department Officers who assist the General Manager in supervising technical and economic problems of the Organisation. The C.E.G.A. also contains three Inspectorates, headed by three General Inspectors, for:-
- (a) inspecting the generation of electricity.
 - (b) inspecting the networks and the attached projects of electricity.
 - (c) inspecting incomes and expenditures of the Organisation.

There are also other Inspectorates in every power station dealing with local problems.(50)

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- (50) Nezam-EL-Amal Be Edart El Kahraba walgas wa Aksamha El Moukhtalfa wa Ta Wzia El-Ekhtesat wa El-Ma Souliatt Beha. Special Report on the work of the C.E.G.A. departments. Unpublished data Cairo (In Arabic).

In 1961 when the Societe Egyptienne d'Electricite was nationalised, it was considered as a part of the C.E.G.A. supplying the suburb of Heliopolies near Cairo, Tramway Company and a large industrial area in the north of Cairo.

2. The Mechanical and Electrical Department (MED) of the Ministry of Public Works.

This Department supplies all electrified irrigation and drainage pumping stations in the country, some municipalities and industrial plants, waterworks and public utility projects in the same areas. The internal organisation of this Department is not known, but it is apparently similar to ordinary Government Departments.

3. The Hydro-Electric Power Department.

This Department is in charge of the Aswan Hydro-electric power station which is considered as the second largest power station in the U.A.R. Its main consumers are the Kima Fertilizer Factory at Aswan, the High-Dam construction site and the electrical power requirements of the irrigation, land reclamation and industrial projects at Aswan and Quena Governates. There is also no evidence about its internal organisation.

The second Ministry'of Housing and Public Utilities' controls the remaining two electricity

Departments. They are:-

1. Alexandria Electricity and Gas Organisation (A.E.G.O.)

It is very similar to the C.E.G.A., supplying the city of Alexandria and some of its suburbs. Its power system was originally owned and operated by the Lebon Company. It came under public ownership in 1961 after the end of its concession in 1961. It serves a population of nearly 2 million.

2. The Mechanical and Electrical Department (municipalities).

Though this Department carries the same name as the (MED) of the Ministry of Public Works, it is responsible for different activities, and it belongs to another Ministry. It is in charge of supplying a great number of towns and villages with all types of current in different municipalities.

Apart from the Electricity Departments examined above, there are several resources of generating and supplying electricity. They are mainly large industrial organisations which own and operate power stations for their own utilisation. Examples of these organisations are, the Suez Canal Authority, the Kom-Ombo Land Company, the Alexandria Water Company, railways, tramways which are not supplied by S.E.E., broadcasting stations and the Maadi Land

Company. The importance of mentioning these resources of supplying electricity is that they are subject to the supervision (especially technical) of the U.A.R. Electricity Commission, but they are owned and operated by the said organisations.(51)

(51) Information about the structure of the Egyptian Electricity Supply Industry are partly based on unpublished data.

Conclusion.

It may be seen from the discussion above that in Britain as well as in Egypt the two Governments have taken measures to keep the administration of the electricity supply industry under public control. In both countries the industry has been re-organised several times.

However, it could be concluded that the structure of the electricity supply industry has some similarities but differs widely in many points.

The Egyptian Electricity Commission established in 1954 had many functions to the similar Central Electricity Board in Britain established in 1927. The main difference between the two structures is that electricity supply in Britain is managed by public corporations while in Egypt it is managed by Government Departments.

The relationship between the central authority in the British electricity supply industry and the Area Boards under either of the two systems (that of 1947 or 1957) is much more organised and closer than in the Egyptian case. It seems difficult that one central authority, the U.A.R. Electricity Commission, to supervise the general function of various Government Departments attached to different Ministries. Lack of this

relationship may result in non-utilisation of the advantages of a centralised planning system in the industry.

In Egypt the Electricity supply Departments undertake widely different functions between them. In Britain Electricity Area Boards undertake similar functions. For example:- the M.E.D. of the Minister of Public Works in Egypt is mainly responsible for electric irrigation and drainage projects while the C.E.G.A. supply electricity to all types of consumers.

It is obvious from the discussion of the two structures that the generation function is more highly organised in Britain than in Egypt. There should be an authority which would be responsible only for generation and main transmission.

It may be noted in the structure of the Egyptian industry that the C.E.G.A. and A.E.G.O. are responsible for supplying electricity as well as gas to consumers. This is due to the small consumption of gas in the two cities as compared with the rest of the country. But as electricity and gas consumption is increasing rapidly, there should be separate Departments for each industry.

Lastly, it may be useful for the Egyptian electricity supply system, in any future organisation, to adopt a

method which ensures that the electricity supply activities are managed in such a way as to avoid the Government Departments' routine. It seems that commercial activities of the electricity supply industry cannot be successfully undertaken by civil servants.

CHAPTER II.

THE STRUCTURE OF BOARDS.

The Structure of Boards.

The governing boards of public enterprises, indeed, deserve the first place in any discussion of the various aspects of organisation and management of the public sector. In this chapter an investigation of the following questions will be made: in what aspects are public boards different?, who runs these boards?, what is the work of full-time and part-time members?, who selects and appoints the members?, and lastly the question of, in what activities should boards have freedom of action?

The first question includes two main points: differences in aims and in size.

Differences in aims.

It is well-known that public boards are entrusted with different spheres of economic activity. Some of them govern industries of a purely commercial nature. For example, the nationally-owned productive enterprises such as coal, electricity, gas and transport in Britain. They are of major economic importance in the whole economy, carrying out the responsibility of producing products and services which are basic to the British economy. Their production is estimated at about 12 per cent of the gross national product. (1) In Egypt boards

(1) Hanson, A.H. (Ed.) Nationalisation, a book of readings, London, 1963 p.11

with the same aims control nearly the whole industrial sector. For example, manufacturing and mining are overwhelmingly under government control. Public transport is also entirely owned and operated by the Government. It includes railways, country and city bus lines, tramways, river navigation, shipping and airlines.

There are also public boards which are only concerned with the financing of private or mixed enterprises. In Britain the Colonial Development Corporation and the Bank of England, commercial banks, insurance companies and other financial corporations are wholly owned and operated by public bodies.

Some of the cultural activities are also run by public boards. The chief examples are, B.B.C. in Britain and the Egyptian Broadcasting Corporation in Egypt.

The aims of public boards may include both commercial and cultural ones. An example in Egypt is the 'Egyptian Public Organisation for News, Publishing, Distributing and Printing' which has no equivalent in Britain. The tasks and main functions of this Organisation are laid down by a Republican Decree as being 'to direct its efforts to taking part in the

general guidance of the nation, elevation of the popular cultural, social and political level, acquainting public opinion with local and foreign news, enlightening it on the principal current of world affairs and propagating information to foreign countries on the United Arab Republic and the Arab world.(2) The way of achieving these aims is based on the commercial methods of the distribution of newspapers, magazines and films of a national and political character in Arab Countries and elsewhere.

Another type of public body is the development corporation. It is found in Egypt and some other countries, but there is no evidence that it exists in Britain. A.H. Hanson describes the form of these development authorities as "the most radical method of attempting to short-circuit the normal government machinery, in a research for developmental drive and coherence." (3) In Egypt there are three examples, the Economic Development Organisation, El-Nasr Organisation and Misr Organisation. Their responsibility is studying, initiating and operating the public sector.

(2) Republican Decree No. 1813 of 1961 Article 2.

(3) Hanson, A.H. Public enterprise and economic development, London, 1959 p.210.

It combines planning with executive and advisory functions. Examples in other countries are the 'Chilean Corporation de formanto de la Produccion' and the 'Iraqi Development Board.'(4)

The discussion above shows, first, that the aims of public boards by whatever names they bear, are different both in Britain and Egypt. Secondly, there are some particular boards, in Britain and Egypt, with similar aims. Some are found only in Egypt and others exist in Egypt and other developing countries, but not in Britain.

The importance of this analysis is that differences in aims may be one of the main factors deciding the constitution of the board and may also affect other problems attached to the members of these boards, which will be examined in this chapter.

Difference in size.

There is no dogma in fixing the size of public boards. The number of members does not only differ from one industry to another, but also the same board could change from one year to another. Differences in size between one board and another is quite clear from the following examples. In Britain the Court of the

(4) Ibid pp. 211, 219.

Bank of England consists of eighteen members, the Governor, Deputy-Governor and sixteen Directors. The B.B.C. has seven Governors in addition to the Chairman and Vice-Chairman. The boards of B.O.A.C. and British European Airways have each not less than five or more than eleven members in addition to the Chairman. The old British Transport Commission had a Chairman and between four and fourteen other members. The present National Coal Board consists of twelve members. In Egypt the board of the Central Bank of Egypt consists of fifteen members including the Chairman. The board of each of the public joint stock companies (affiliated to the Economic Development Organisation) consists of seven members. In contrast with the above examples some foreign public boards have fixed size. For example, Electricite de France, Gaz de France and Carbone de France each has fifteen members on its board.

The disadvantage of fixing the number of members, as in the French example, involves a loss of flexibility required to accord with differences in the activities of the industries, while in Britain nearly all the productive public enterprises assured this flexibility in the size of their boards. The danger of a dogmatic

fixing of the number of members comes from the consequences of a board being too large or too small. If the board is too large it will lose the spirit necessary for joint deliberation. On the other hand, if it is too small, it will not have the necessary diversity of outlook and experience for a comprehensive view of all major aspects of policy. This strikes Professor Robson in the case of the Damodar Valley Corporation in India and the Tennessee Valley Authority in the U.S.A., which have boards consisting of only three members.(5) Thus the argument may conclude that giving a range between minima and maxima of number of members can assure the flexibility and co-ordination necessary in a public board. To apply this method, a wide discretion for the appointing authority to add more members must be given. But this wide discretion is a risk except if there is some assurance that the choice of such additional members is likely to be good. However, this is a minor disadvantage against this method in order to constitute a board of an optimum size. Generally speaking the size of the board may be influenced by two main factors.

(5) Robson, W.A. Nationalised industry and public ownership, 1962 p.214

- (A) The technical complexity of the industry. This means, the need for more of less technical personnel may be a guide for widening or lessening the size of the board.
- (B) The dimension of the industry and the activities carried out by the board. In this connection it is important to remark that in Egypt the board of the E.D.O. is directing a large number of different industries and participating in the management of many public and semi-public companies. The Board of the E.D.O. consists of only eight members, while it seems necessary for such a board to be relatively large. A suggestion of not less than twenty members could be made in order to ensure that decisions are taken with wider views. The importance of these two points is that they are the only alternative working against the constitution of a board on a special agreement or special interests.

The second aspect of the problem of size is that there is a variation in the number of members on the same board at different periods. This was obvious in the British National Coal Board since its creation. The original Coal Board consisted of a Chairman, Deputy-

Chairman and seven other full-time members. The 1949 Act increased the maximum size of the board to twelve members instead of nine provided that not more than eight should be full-time. "This higher maximum was doubtless introduced to enable the Minister to strengthen the board without infringing the rights of the previously appointed members." (6)

Turning to the electricity supply industry, again the electricity boards are different in aims and in size. In Britain the Electricity Council is a policy-making body, as could be seen from its functions. (7) The Generating Board is entrusted with generation and bulk transmission. The Area Boards are mainly the distributors of electricity to various consumers. In Egypt the U.A.R. Electricity Commission is to a greater extent similar to the British Electricity Council in its aims except that it is a Government Department. It is responsible for drawing up the general policy for the industry and studying the problems of the electrification of Egypt. There is no board in Egypt similar to the British Generating Board, unless, but to a lesser extent, we consider the Technical Bureau which is charged with

(6) Robson, W.A. Op.Cit p.214

(7) See p. 62

technical problems in the industry. However, it is not by any means a generating board.

Although Area Boards in Britain and Electricity Departments in Egypt are similar in their main function, i.e. distribution, there are two differences worth noting.

- (1) Whilst Area Boards in Britain have the same character, Electricity Departments in Egypt differ from each other. Some of them distribute electricity to a variety of consumers, others are charged with supplying specific fields as in the case of the M.E.D. which supplies only irrigation and drainage systems in the country.(8)
- (2) Electricity Departments in Egypt have full power to generate as well as to supply electricity. Regarding generation it is practically impossible for them to rely on a central bulk supply, because some of them are geographically remote, as the H.E.P.D., and the construction of an efficient grid system is not yet in existence. In Britain Area Boards have also the power to generate electricity but with the permission of

(8) M.E.D. of the Ministry of Public Works. See p. 73

the Minister. However, generating is not one of their main functions as in the Egyptian case.

Differences in size also exist between different electricity authorities. The British Electricity Council consists of twenty-one members, the Generating Board has ten members on its board and each Area Board consists of only nine members. In Egypt the U.A.R. Electricity Commission is comparatively smaller in size than the Electricity Council. It consists only of thirteen members. But if we take into consideration the difference in population, consumption per capita, standard of living and differences in the degree of usage of electricity in industry, agriculture and households, the Commission's Board is reasonable in size. There is no data available about the number of the Board's members of Electricity Departments in Egypt. If the size of an electricity Board is determined by the technical complexity and dimension, the British Electricity Council is a very well balanced board. This is clear from the representation of the twelve Area Board Chairmen, the Chairman and two members of the Generation Board and six other independent members. This makes the Council an efficient body for consultation and formulation of general policy of the industry as a

whole. In Egypt the U.A.R. Electricity Commission is reasonably constituted. The Board combines the Under-Secretaries of State of Electricity Departments, the Chairman of the Technical Bureau - who is already the Secretary General of the Commission - plus representatives of large industrial consumers in the country, such as the Railway Organisation and the Federation of Chemical Industries.

The second question to be answered in this chapter is who runs the boards. This question may be examined under two main headings: the qualifications of the members and whether they are full-time or part-time.

(1) Qualifications of Membership.

The success of any enterprise depends on many factors, one of which is the staffing of the enterprise. To take the example of manufacturing public enterprises, there are three categories of employees. Men 'at the top' who formulate the general policy, employees who supervise the execution of this policy, and workers who carry out the operations.

There is no doubt that the success of the enterprise depends more on the first category than the other. This might be illustrated if we assume that a

mistake has been made. The effect of mistakes made at the top is more damaging than those which happen at any other level. For example, a wrong decision to invest several millions of pounds on a project in the electricity supply industry will have serious consequences on the prosperity of the industry. The general wages or pricing policies have also a similar effect if they were not to be decided with great care. For these reasons, members of the board must be selected. Selection of members must, first of all, satisfy one important condition, namely, what sort of ability is it that we are looking for? This question has been answered by F.C. Hooper as "a great administrator above all has judgement, personality and common sense judgement that makes his decisions right more often than they are wrong."(9) In addition to this general description of personality, the qualifications necessary to be held by any member may be broadly classified into two:

- (1) Technical, that is men who have a wide experience in certain fields of applied science and technology.
- (2) Professionals, these are men who hold non-technical qualifications such as accountants, lawyers and economists.

(9) Hooper, F.C. Management in the public services, Public Administration Vol. 28 1948. p.218

According to differences in the aims of boards, public enterprises engaged in production of goods and services must have on their boards a combination of these two qualifications. An example of a well-balanced board of this type, is the original Coal Board formed in 1946 from experts in different fields. They were: the Vice-Chairman, a former Civil Servant, and other members were:

- (a) a mining engineer, (b) a leading physicist,
- (c) an accountant, (d) a specialist in marketing,
- (e) the secretary of the Mine Workers Union and
- (f) the secretary of the Trades Union Congress.

But it should be noted that the constitution of such a board must not follow any fixed formula. What is needed is a combination of personal qualities and of special experts in particular fields.(10) Public enterprises engaged in cultural activities may be governed only by the second category, i.e. by non-technical professionals, the B.B.C. in Britain and the Egyptian Broadcasting Corporation in Egypt are examples. But Professor Robson stressed the need for technical qualifications on the B.B.C.'s board. He

(10) Cole, G.D.M. National Coal Board, Political Quarterly Vol. 17 1946, p.318

explained that the Board of Governors, occupying a position of responsibility towards the public and of authority over major policy should have moral calibre, intellectual equipment, political opinions, social assumptions and general capacity.(11) He went on to say that the governing body of the B.B.C. provided the poorest example mainly because technical qualifications are considered unimportant in selecting the governors.(12) It may be true that technical abilities are important even in the boards of cultural aims such as the B.B.C., but they do not have the same importance as in electricity, gas or coal boards. Although Professor Robson argues for the need for technical qualification in a board of cultural aims, one of the Egyptian public organisations, which practically need these technical qualifications, does not have them on its board. This is the 'Egyptian Public Organisation for News, Publishing, Distributing and Printing'. It is an enterprise of cultural and commercial character. Its present board of Directors is composed only of people of administrative and political quality. These are,

(11) Robson, W.A. (Ed.) Public enterprise, London
1937 p.86

(12) Ibid. p.370.

the Minister for Information Affairs, as a Chairman, the Director of the Broadcasting Organisation the Director of the Information Department, the Director of the Tourism Department and a Member of the State Council as members. (13) This type of board would need at least one member of technical qualifications to deal with technical problems concerning for example printing.

An example of an Egyptian public organisation which gives a reasonable constitution of its board, is the Economic Development Organisation which functions in the studying, initiating and operating an important part of the whole public sector. Its board is composed of persons who have had a long experience in planning, financial and legal matters. The Board's members are:

- (1) A retired officer as Chairman.
- (2) A former Deputy Minister of Finance.
- (3) The Sub-Governor of the National Bank of Egypt.
- (4) The Secretary-General of the National Planning Committee.
- (5) A former Company Director.
- (6) Councillor at the Presidency.

(13) Republican Decree No. 1813 of 1961 Article 3.

- (7) Director General of State Budget.
- (8) Director at the Ministry of Industry.(14)

The above examples show the qualifications required or already existing in some of the British and Egyptian public enterprises. Apart from this, the general pattern laid down by the various Acts constituting the British public board select those who are considered to have had wide experience on and shown capacity in specified fields. The types of experience vary between corporations but they nearly all include industrial, commercial and financial matters, administrative and the organisation of workers. One of the pre-war nationalisation boards, in Britain, the London Passenger Transport Board, consisted of seven members, two of whom were required to have had not less than six years local government experience. (15) Also post-war Acts of gas, transport and coal required specific qualifications related to each industry's scientific field. In the electricity supply industry, the 1947 Act stated that the Chairman and other members of the Central Electricity Authority

(14) Egyptian Economic and Political Review March, 1957
p.215.

(15) Morrison, H. How London is governed, London, 1949
p.129.

should be selected from amongst persons appearing to the Minister concerned as having had experience of and having shown capacity in generation and supply of electricity, industrial, commercial and financial matters, applied science, administration and the organisation of workers. Reference to generation has been omitted and experience in local government or agriculture is added as an acceptable qualification. This is also applied in the constitution of Area Boards. To satisfy these requirements the Minister tries to make a balance between the technical and administrative qualifications. It has been claimed in the evidence of the Select Committee on Nationalised Industries that 'as a rough rule, if the Area Board Chairman is an engineer then his Deputy-Chairman would probably need to be somebody more on the commercial or administrative side or vice-versa'.(16)

In Egypt, the first Egyptian Electricity Commission consisted of only sixteen engineers.(17)
The lack of administrative quality and other professions

(16) Select Committee on Nationalised Industries, Electricity Supply Industry, Minutes of Evidence H.C. 236 - 11 May, 1963 Q 55.

(17) National Planning Committee memorandum No. 233 Report of the Central Committee for Industries and Electric Power (in Arabic).

on the board lead to the re-organisation of the commission. The U.A.R. Electricity Commission established in 1959 has a reasonable combination of engineering and administrative qualifications. The administrators are, namely, the Deputy-Minister of the Treasury and the Director of the Railways Authority, an economist, but in general electrical engineers provide a great proportion of the qualities of the electricity boards. (18)

Sources of Membership.

A problem which is closely connected with the qualifications' issue is, where to find these people. Will they be promoted from within the industry or recruited from other sources? This will lead to the controversy about workers and consumers' representation on the boards of public corporations. Also the question of whether members of Parliament or Ministers should be board members, could be raised in this context.

With regard to the conception of 'within the industry', it is the general practice in private enterprises that nearly all full-time members are

(18) See Chapter I p.67

recruited and appointed from within the company.(19) The main reason given is that these men have been trained and have gained experience of the problems of the industry. In British public enterprises, also, most of the full-time members have had previous experience of the industry before nationalisation.(20) But the principle of 'within the industry' in public enterprises is still a controversial issue. It has been advocated by Simon and by the Fleck Report. Both consider that full-time members should be drawn from within the industry. Although Simon excludes the appointment of the Chairman if he was a distinguished outsider, he emphasises the principle by saying 'this will certainly not improve the morale of the industry if the ablest men in it have no confidence that top posts will be available to men from within the industry'.(21) Professor Robson does not fully agree with the principle. He says, that in the future men who will direct the public corporations will have been trained and will have grown up in the nationalised industry itself but: 'we must

(19) Simon of Wythanshaws Lord: The boards of nationalised industries.

Hanson, A.H. (ed.) Nationalisation, p.187

(20) Hanson, A.H. Managerial problems in public enterprises, New York 1962 p.50

(21) Simon, Op.Cit. p.194

nevertheless take care not to imply this principle too rigidly or too soon'.(22) He gives the example of railways and coalmining industries as they had been under mismanagement for a long time and they still need men of higher administrative quality from other occupations rather than those available in the said industries. The Political Quarterly commented on 'the Fleck report's conception that full-time members would normally come from within the industry' by saying that if this practice were to be adopted in the nationalised industries the board would suffer from a shortage of experience in other walks of life.(23) It was again explained that this shortage is the major defect of both coal and railways in Britain.

It could be concluded from the argument about the principle of 'within the industry', that even the advocates of this conception could exclude a distinguished outsider. It is true that a complete neglect of outside experts is a loss for the nationalised industry concerned. But, as a normal practice, the appointing authority must try first to select members required from within the industry, secondly, from another nationalised industry and thirdly, from outside private industries which have

(22) Robson, W.A. Nationalised industries and public ownership p.221

(23) Op.Cit. Vol. 26 1955 p.99

similar management problems. This device would be applied to full-time members. The advantages of following this line are, first, if the member is appointed from the industry, he will be aware of most of the problems concerning the industry which will enable him to contribute in a correct policy. Second, if the member comes from another nationalised industry he will at least have knowledge about the common problems concerning the whole public sector. He will easily adapt himself to become familiar with the industry concerned. If these two ways fail there is no alternative except to appoint a member from the private sector. But in this case he must come from a large-scale organisation. The interesting argument about the appointment of Dr. Beeching, a former Chairman of the I.C.I., as a Chairman of the B.T.C. in 1961, shows the importance of this device. There has been much said about the case. To summarise, the opponents of this appointment accused the Minister of not having made any serious attempts to find a man with the necessary qualifications who had already been in the railways service. Such a man would have had enormous advantages, as this promotion within the organisation would have stimulated morale among railwaymen instead of depressing it. They also accused the Minister

of not searching among the able staff of other large nationalised industries. The Minister's reply was, first, that this appointment assured the rapid remedy for the urgent need of the railways, that was to find a man who has proved himself in top management of one of the most successful industrial concerns. Secondly, the introduction of new blood from time to time will be of a benefit to any large organisation be it nationalised or not.(24)

One can criticise this reply by saying, that an able man either within the Railway's Organisation or any of the other nationalised industries could be found to be promoted to the post of Chairman. Even within the Railway's Organisation, if it is considered unprofitable by the profit and loss account measurement, it is known that the railway services work as a commercial undertaking as well as for the national interest. Thus if it is considered unprofitable it does not necessarily follow that it does not have a man with the ability to be a Chairman. Moreover an able member of the Board's Organisation who may prove himself to be a successful Chairman should be promoted. If this was not the case in the railways, there must be another member in other

(24) H.C. Debates (1960-61), Hanson, A.H. (ed)

Nationalisation: a book of readings. p.181

successful nationalised industries. The electricity and gas industries are examples.

The second point is not convincing, because new blood from other large nationalised industries is more beneficial than any other from the private sector. It is at least of the same type.

So far as the Egyptian public enterprises are concerned the problem must be examined under three types of organisation:

- (1) Nationalised industries which were already well established under private ownership as in the British nationalised industries. The problem was either to appoint the former directors of these enterprises or outsiders. The main objection to appoint the former directors could be expressed in the words of the left-wing section of the labour movement in Britain quoted by A.H. Hanson. They are described as 'The same old gang is in control; we expected to have a new moral world, that the wicked old capitalists would depart and bright new socialist managers come into power. This has not happened and consequently what we have on our hands is not socialism but capitalist's nationalisation.'(25)

(25) Hanson, A.H. Managerial problems in public enterprise New York 1962 p.51

To a greater extent this criticism was taken into consideration in appointing the former directors of the Egyptian industries. The authorities only appointed those directors who could adapt themselves to the new socialist methods of the country. Of course the rest of the members were outsiders.

- (2) Government Departments which run some of these industries. There is no acute problem here. Appointment of members follows the State regulations.
- (3) Newly created industries brought into the public sector. The problem here was the lack of experts to manage these industries. They mainly came from Senior officials in the Civil Service who had had long experience and special reputation in managing large-scale organisations and from the other important category, University staff.

In the electricity supply industry, in Britain, the normal source of appointments of a full-time member is by promotion from the industry itself. This applies within the whole of Area Boards, but not necessarily from within the same Area Board, and include both technical and administrative qualifications. Appointments

are made from within the industry not only for full-time membership of an Area Board but also for the posts of Deputy-Chairman and Chairman of the Electricity Council Headquarters. In fact the industry has not gone very much outside the industry for any appointments. It is the exception rather than the rule. Two examples only were given. They are the Chairman of the South Western Board who came from the aircraft industry and the Chairman of the South Wales Board who came from the Uganda Electricity Board.(26)

This would be the normal practice which should be followed by all other nationalised industries in Britain. Apart from reasons given above the electricity supply industry is involved in particular economic and technical problems which seem to be impracticable for an outsider to deal with successfully. Although it seems that economic theories can be applied to any industry and by any economist, but when we come to the practical application of these theories, a member of the board must have a practical background to contribute in formulating a general policy. Planning and pricing policies in the electricity supply industry are examples.

(26) Select Committee on Nationalised Industries

Electricity Supply, May 1963 Q 331, 54, 56 and 58.

In the Egyptian Electricity Departments, they also have the same rule, simply because they follow State regulations of recruitment and promotion which normally imply that appointments are from within the industry. But in the case of the U.A.R. Electricity Commission some of the members are outsiders. These are, the representatives of large consumers, Deputy-Ministers of the Treasury, Communications and Industry, and the Legal Councillor of the Ministry of Public Works.(27) In the future, and particularly after the creation of the Ministry of Electric Power in 1964, it is expected that all full-time members will be chosen from within the industry.

Workers' and Consumers' Representatives.

In Britain representation of workers at board level in the nationalised industries has been a controversial issue for a long time. D.N. Chester gives a brief history of the participation of workers in the management of nationalised industries.(28) Two different views have been expressed on this problem. G.D.H. Cole believes that industrial democracy means

(27) See page 67

(28) Chester, D.N. Management in the nationalised industries Public Administration Vol.30 1952 p.27

that when a worker receives orders he must, if he is to be free, feel that these orders come from himself, or from some group of which he feels himself to be a part, or from some person whose right to give orders is recognised and sustained by himself and by such a group.(29) ^{At} ~~An~~ an annual Labour Party conference in 1933 it was declared that wage earners have a right 'which should be acknowledged by law' for direct representation through their trade unions on the boards directing nationalised industries.(30) A.H. Hanson states that workers' representatives will normally be nominated by the most representative trade unions in the industry in such a way as to secure representation for the main categories into which the labour force is divided. He went on to say that this is not always easy: 'it may be rather difficult, particularly if there is a large number of rival overlapping trade unions.(31) It is true that representation of workers on the boards of the nationalised industries is a difficult problem. Even trade unions have different views.

(29) Ibid. p.69

(30) Robson, W.A. (ed) Public enterprise 1937 London,
p.370.

(31) Hanson, A.H. Managerial problems in public
enterprise. p.49.

G.D.H. Cole (32) states that the N.U.R. have the view that trade unions' representatives must have seats on the boards without being obliged to resign from their trade union responsibilities. Against this view the N.U.M. preferred to be independent of the N.C.B. They suggested that the government had better be left to appoint the boards without any direct representation of the workers.

The main criticism against workers' representatives is that this will endanger the efficiency of the industry and in particular the interests of consumers. The report of post-war reconstruction in 1944 explained that the problems which would rise from the participation of the unions and workpeople at all levels of control could perhaps not even be foreseen. The truth of this statement comes from the fact that we cannot foresee the extent to which the forces of a high staff level is going to succeed. Nor could we assess what the actions of organised labour might be in the event of success. However, the Report made one point quite clear: that it would not be in the interests of workers of a nationalised industry to have as direct

(32) Cole, G.D.H. Labour and staff problems under nationalisation, Political Quarterly Vol.21, 1950 p.161.

representatives of them, members of the controlling board who would be committed to joint decision. It will be essential, they added, not only for the maintenance and improvement of the standards and conditions of the workpeople but because of the power of independent criticism that they can exert, that the trade unions shall maintain their complete independence.

From the different views discussed above, one could conclude that direct representation of workers' representatives may lead to undesirable effects upon the general policy of the board. First, the danger feared for consumers' interests which can be summed up in the question, 'higher wages or lower prices.' Secondly, it could be argued that a board member should be concerned fully with all problems in the industry including workers and consumers problems. It may be expected that a workers' representative will be in favour of human problems even if it is against other interests. It has been claimed that even ex-trade union leaders, should they be members, are expected to behave as though they were still employed by the union. The reasonable solution to this problem is that which is clearly stated in the nationalisation Acts. Among the qualifications accepted for membership

is qualification in the organisation of workers. One should add that such a member should not necessarily be an ex-trade unionist, but in any case he should be a member who has had qualifications in the organisation of labour and other problems of industrial relations. In addition he should be a member whom the workers are satisfied that he will look after their problems.

In Egypt, the problem can be examined within two types of boards. There are boards which carry overall responsibility for building the whole economy and for supervising the public sector and secondly, boards of public companies and organisations which manage the various industries. There is no evidence that workers are represented on boards of the former type. Those of the latter type, workers and employees are granted the privilege of being represented on the boards of directors of each public company or organisation by two members elected by a secret ballot.(33) This right prevents the trade union's intervention in the matter. They have thus been described as "they are no longer groupings for the seizing of rights or defence of interests in opposition to employers but have become

(33) National Bank of Egypt, Economic Bulletin Vo.XIV

centres of or the concentration of workers and parliaments for the expression of their opinions; unions are no longer charitable societies helping the distressed and treating the sick - they must become centres of revolutionary instruments for pushing the wheels of production."(34)

It is too early to foresee the economic consequences of the Egyptian experiment of giving two seats to the workers on every board of public companies consisting of seven members only. The general direction on the problem in the British case stated above cannot be applied on the Egyptian case, because of completely different environments. But one may think that representation of workers here is merely a socialist view to give the workers some of their rights. But from the managerial point of view it may be against the autonomy of the board required to formulate a major policy.

Consumers' Associations as a source of membership presents a more difficult problem. The main difficulty lies between two points of view. One is that the consumer's councils should have one or more of their

(34) Al-Ahram al-igtisadi. 1. December 1961 Quoted by Issawi, C. Egypt in revolution, New York 1963 p.196

executives as members on the board, the other is that complete independence of these councils ensures the effectiveness of their role to safeguard the consumer's interests. The Herbert Committee investigating the problem in the British electricity supply industry find a value from the presence of the consumer's council's chairman in the Area Board. They state that this 'enables him to appreciate the background of the board's policies and to influence these policies on the consumer's behalf in their formative stages.(35) Against this view A.B. Griffith states that one of the main defects in consumer councils' relationship with the boards is that they are too closely linked which is a weakness in the suggestion that consumer's representatives should sit on the boards of the corporations.(36) Also Professor Robson refers to the recommendation of the Chambers Committee that the Secretary of the Transport User's Consultative Committee for London should not be from the staff of the London Transport Executive. This will ensure the

(35) Report of the Committee of Inquiry into the Electricity Supply Industry Comd./9672 January, 1956
para. 454

(36) Griffith, L.A.G. The voice of the consumer The Political Quarterly 1950, Vol. 21, p.178.

independence of the committee. He also refers to the Labour Party statement on the same problem which will result in a conflict of the Secretary's interest, a conflict between his career and fighting the board on behalf of the consultative council. He finally suggests that 'one way of avoiding these difficulties is to appoint able civil servants on local government officers either shortly before or soon after they have retired'.(37)

A.H. Hanson's view on the problem is that consumers of the product of a nationalised industry are not an organised body. The various organisations such as chambers of commerce, local government authorities, industries which purchase the products, co-operative societies and so on are not satisfactory representatives. He quotes Bye's opinions saying 'under these circumstances, the law either designates the categories of consumer to be represented, or leaves it to Governments to name, at its discretion, the representatives of the consumers. The disadvantage of the former procedure is that it is arbitrary, while the disadvantages of the latter is that it permits the Government to increase the number of its own representatives.(38) The question I am

(37) Robson, W.A. Nationalised industry and public ownership, p.264

(38) Hanson, A.H. Managerial problems in public enterprise p.49-50

concerned with, regarding this problem, is whether to adopt the device that the consumer council's chairman should sit on the board, and whether this would strengthen the voice of the consumer regarding any complaint; or should consumers' councils be independent for the sake of their interests, from whatever categories they are formed into?

The present management in the British electricity supply industry, in which the chairman of the Consumer Consultative Council, is a part-time member in the Area Board, does not prove that the consumer has any power. This is made clear from an answer by R.H.M. Barkham, Deputy Chairman of Yorkshire Electricity Board, given in 1962. The question was, what power has a consumer to force the Electricity Authority to supply electricity within the statutory voltage limits of plus or minus 6%. In the long answer to this question, he stated 'I do not think, if we are honest, (the consumer) has any real power at all.'(39) But this does not mean that we should abandon the idea of representing Consumers' at the board. In fact, the evidence above shows that it is important to strengthen the Consumer's voice in the board especially where worker's interests are already represented.

(39) Summer school, Electricity Council publications, 1962 p.72

In Egypt, there is nothing mentioned in the nationalisation Republican Decrees about consumers' representation on the board. Nor is there enough known about consumers' councils as a whole.

The question of whether members of Parliament and Ministers should sit on the board or not, is differently answered between British and Egyptian public enterprises. While in Britain Members of Parliament are disqualified from sitting on public boards, in Egypt there is no statutory legislation which indicates that they should not. Also while Ministers in Britain are not allowed to be members of public boards, it is already practised in Egypt as we have seen in the case of the E.D.O. and the U.A.R. Electricity Commission. With regard to Members of Parliament, they are not in a position to be useful as board members. One of the reasons given by A.H. Hanson is 'from the very nature of his job, he is susceptible to pressures from interest groups, from his constituency and even from individuals who want jobs for themselves or their relations.(40) For this reason one should say that this principle must not be applied in the Egyptian public enterprises.

(40) Hanson, A.H. Managerial problems in public enterprise p.53

For Ministers it is a different matter - while in Britain, the principle will reduce the autonomy of the boards they are fighting for, in Egypt it will not practically make any difference. The relation between public enterprises and Ministers concerned in Egypt is far greater than that in Britain. Also it may be of necessity to some types of public enterprises that the Minister should be a chairman as in the Development Organisations. This will foster decisions of national economic planning which are the main functions of these organisations.

The work of full-time and part-time members.

In the last section sources of membership were discussed. The first part, i.e. from within the industry or from other sources was mainly applied to full-time members. The second part, i.e. for workers and consumers associations, was applied to both full-time and part-time members. In this section the work of both categories of members will be examined.

In a pamphlet by the Acton Society Trust 'the men of the boards', it is shown that the twelve boards under review were manned by 47 full-time and 48 part-time members.(41) Of course the proportions between

(41) Op.Cit. No.4 1951 p.4

these two classes differ from one public board to another. While the Coal Board consists of eight full-time and four part-time members, the Gas Council consists of two full-time and twelve part-time members. The latter are the twelve Area Board's chairmen.

This difference depends on the distinction between the functional board and the policy-making board. In Britain, there is no purely functional board or purely policy-making board among the public boards. But the assumption is, if the majority of the members are full-time appointees, the board is nearly functional, and policy-making if the majority of the board are part-time members. Again this principle is not universal. For instance the T.V.A. Board in the U.S.A. consists of three full-time members none of whom has functional responsibility.(42) However, the main interest here is to examine the work of these members within this classification. To start with the full-time members: in a functional board a full-time member is ultimately responsible for a particular department or group of departments in the industry according to the various aspects of the

(42) Hanson, A.H. Managerial problems in public enterprise p.40

industry's work. For example in the constitution of the National Coal Board recommended by the Fleck Report, every full-time member except the Chairman and the Deputy-Chairman is responsible for a specific department. There are full-time members for production and reconstruction for marketing, for purchasing and stores, for finance, for industrial relations, for staff and for scientific affairs. Such a functional board can be criticised on the following points: First, the full-time members will bring too much detail to discussion at the top which may be a waste of the board's time. Secondly, a specialised member may be unable to take a broad view on the general policy of the enterprise and, thirdly, there is a possibility that decisions will be made by a process of rather unprincipled compromise along the lines of 'I will support what you want if you will support what I want.' (43) Thus the whole concept of functionalism could be damaged if these criticisms appear or have any force. A lesson from private enterprise can be given from one of the most successful private enterprises in Britain, Unilever Limited. In this company the maximum number of directors is

(43) Hanson, A.H. Managerial problems in public enterprise p.39

twenty-five. All members of the board are full-time, each with a managerial appointment in the enterprise in addition to their post on the board. But to avoid the first criticism, above, there is a special committee appointed by the board consisting of a few members who are freed from all routine executive duties.(44) The idea here is based on the assumption that a full-time member who sits on the board table to discuss the general policy must not in practice be the head of the department or departments which he supervises. There must be an executive, at the head of each department, responsible for its day-to-day management. Limitation of the duties of the full-time member must be specified to ensure that a clear policy is laid down to cover the whole work of the departments coming within his sphere of interest. He would also have to be satisfied with the organisation of staffing and progress of such departments.(45)

The work of the full-time member in a policy-making board is different. He has not a functional

(44) Bonham, A.D. The case of Unilever Limited, Business enterprise by Edwards, R., and Townsend, H. London, 1958 p.338.

(45) Robson, W.A. Nationalised industry and public ownership p.227.

responsibility. His duty on the board is to deal with specific problems concerning the industry beside the general policy. In this case he should come from within the industry. For example in the transport industry full-time members should be professional transport men who have to come up in the service. They are also expected to be experts in some fields of transport.

In doing his work, a full-time member is expected to give up all his outside jobs such as directorships and other paid commercial or trade union posts. Hilda Kahn emphasised the importance of this statement by saying that the Iron and Steel Act of 1953 foreshadowed the position which states that 'the whole concept of full-time service has thus become rather elastic and the line between full and part-time has become further blurred by the creation of what may well become a new category of most-of-the-time posts.(46)

Turning to electricity, it seems that the principle of functionalism is applied in the Central Electricity Generating Board in Britain. Apart from

(46) Kahn, H.R. Payments for political and public service, Public Administration vol. 32, 1954 p.190.

the chairman who exercises an overall responsibility, all full-time members have functional responsibilities. There are full-time members responsible for engineering, for operations and personnel, for finance and administration and for research and development. Even the Deputy-Chairman is functionally responsible for commercial trading and nuclear health and safety.(47)

The 'British' Electricity Council and the Area Boards are different. The former, as a policy-making body, has only one full-time member apart from the Chairman and Deputy-Chairman. He has no departmental responsibility. An Area Board too has only the Chairman and Deputy-Chairman as full-time members, with no functional responsibility.

The role of part-time members in the boards of public enterprises in Britain is an important one. They are nearly equal in number to full-time members. In British nationalised industries, it is a universal practice that the Minister appoints a group of part-time members to each board. The general idea about the part-time post is to bring to the board from the outside world fresh ideas and wide experience in

(47) Turner, E.J. The Generating Board - organisation and development, summer school Electricity Council London, 1962 p.8.

public affairs. The work of the part-time members was considered by the Herbert Committee as of great necessity to the electricity supply industry. The Report described them as being men who can bring fresh ideas and uncommitted minds to bear on the problems of electricity supply; men who may not know all the answers but who will ask the right questions, men whose presence will stimulate a healthy discipline on the executive and secure that any project which may have been ill-considered is rejected.(48) In justification of this principle the Committee recommended that the Chairmen of the Area Electricity Boards should be appointed for part-time duty only.(49) In fact, this recommendation cannot be accepted because it works against the principle of 'from within the industry' examined in the last section. Also the Chairman of the Area Board must devote all his time to major policies in the board, without being committed to other occupations outside the electricity supply field, as is mentioned above in the Iron and Steel Act.

(48) Op.Cit. ~~Cmd.~~ 9672 1956 para. 277

(49) Ibid para. 281

The Committee itself was not sure of the success of this recommendation. They say in the same paragraph that 'we do not suggest that all Area Board Chairmen's posts could be converted to part-time appointments overnight; but we consider that an early start should be made in one or two boards as opportunity offers.(50) However, the recommendation was not adopted by the 1957 Act although there is no statutory requirement that the Chairmen of Area Boards shall be full-time members. The importance of the work of part-time members is also recognised by other authorities. For example, in a Report of the Select Committee on Nationalised Industries, British Railways 1960, the Commission justified the principle of appointing part-time members on Area Boards on the ground that such men with their wider experience will be able to bring to the railways' affairs the value of their contact with other industries.(51) The Fleck Report on the Coal industry assigned an important role to part-time members, that is apart from advising the board that they would advise the Minister on the selection of full-time members. This principle will be examined in

(50) Ibid para. 281

(51) Op.Cit. H.C. 254 Q 1776

the next section.

If the role of part-time members has this importance, they are expected in carrying out their job to give much of their time to the board. This was remarked by the Report on the Nationalised Industries, B.O.A.C. 1964, that a part-time board member who just comes to one meeting a month and is not seen again until the next board meeting is quite useless. Members, on joining the board, should give 50 days a year in discussing the board's affairs. This would enable them to take a greater interest in the corporation and at the same time they would be available for committee meetings.(52) Supporting this view Kelf-Kohen says that part-time members could play a valuable part in the function of the board on condition that they give up some of their responsibilities outside the board. But comparing them with the full-time members, he concluded that part-time members would not have a sufficient knowledge about the problems of the industry because of their lack of detailed knowledge. Therefore they are not of great value to the board. They will only have a marginal influence and the 'public will be misled if they assume that the presence of three

(52) Op.Cit. H.C. 240-1 Q 453

of four part-time members on a board will make any difference to the policy of a nationalised industry.(53)

One should agree that if part-time members do not give much of their time to the board they are serving, they would not be of great value. This is logically applicable to any other job. Also, it is true that they are not comparable with the full-time members regarding their value to the board. But this would not reduce their important role assuming that they give sufficient time to the industry's problems. An example of the qualifications of part-time members working in the Central Electricity Generating Board in Britain gives us an indication of their value to the electricity supply industry. They are:

- (1) the past president of the Royal Institute of British Architects who has a wide reputation and a particular interest in questions of amenity and who may give a great deal of help on matters of siting power stations and transmission lines.
- (2) a member of the I.C.I. who has a special interest in finance problems.
- (3) an ex-regular soldier with considerable industrial and business experience.

(53) Kelf-Kohen, R. Nationalisation in Britain,
London, 1958 p.205

(4) a member of the National Coal Board who has a wide experience and knowledge of labour relations and representing an industry whose operations are so closely connected with the Generating Board.(54) There is no doubt that these members can give a valuable contribution in discussing the board's affairs.

Also in the Electricity Council or any of the Area Boards, part-time members are expected to bring to the board's table their outside experience in different economic and technological spheres, and the views of distribution trades, housewives, trade unions etc. But they should not represent any particular interest or section in the community.(55)

The whole problem of full-time and part-time members in the Egyptian public enterprises can be discussed within two main types of boards. Development Organisations which are mainly policy-making in character, usually consist of part-time members only. These are Ministers, Senior officials in Civil Service, University Staff, and Directors of other organisations.

(54) Stafford, A.H. The Generating Board and its work, Summer school Electricity Council, 1963 p.12

(55) Select Committee on Nationalised Industries, Electricity Supply Vol.II. Minutes of Evidence H.C. 236-II May, 1963 Q. 71 and 78

The three main examples are the E.D.O., El-Nasr Organisation and Misr Organisation. The second type is public companies which have boards consisting wholly of full-time members. This is understood from the Republican Decree which states that no-one is allowed in his personal capacity or on behalf of another person, to be a member of more than one joint stock company.

In the Egyptian electricity supply industry, it is found that members of the U.A.R. Electricity Commission are working on a part-time basis, but there is no evidence about the members of boards of the Electricity Departments.

Selection of members.

In the previous sections examination has been made of the problems attached to board members both full-time and part-time. If the qualifications of proposed members and the work which they have to carry out are known, the question which arises here is who appoints them and how they should be appointed.

True, the role of the appointing authorities, concerning public enterprises is of major importance. On their choice of the competent members of the enterprise's board depends to a greater extent the success of the enterprise.

From the British experience, a discussion will be made of the general procedures which have been suggested and others whereby the selection of members might be made.

It is clear, in Britain, that the appropriate Minister is nearly the sole power of appointing public boards' members. Even in the case of the old London Passenger Transport Board, the original Bill of setting up this board provided that the appointment of members should be done by the Minister of Transport, but, as Morrison says, the anti-socialist views of the national government caused them to provide for an appointing body called the Appointing Trustees. This was introduced in the L.P.T.B. Act of 1933.(56) The Appointing Trustees procedure was overwhelmingly criticised from all sides. Other formal exceptions are the boards of the B.B.C. and the Bank of England of which the Chairman and Governors of the former and Governor and Directors of the latter are appointed by the Crown. In practice these appointments are made by the Government of the day. For example, the Chancellor of the Exchequer in the case of the Bank of England and the Postmaster General in the case of the B.B.C.

(56) Morrison, H. How London is Governed. London, 1949

The procedure by which the Minister should select the members of public boards has been suggested by different authorities. The Fleck Report on the organisation of the coalmining industry suggests that the Minister before appointing the Chairman, Deputy-Chairman and the full-time members should seek the advice of part-time members. And before appointing part-time members he should consult some experts in different fields such as the President of the Federation of British Industries, the Chairman of the T.U.C. and the President of the British Employees Confederation and one or two other persons.(57) This scheme is intended to help the Minister in making the proper selection. But it can rightly be criticised on the following grounds:

- (1) In consulting part-time members, it will make an undesirable distinction between part-time and full-time members. It will also undermine the authority of the Chairman and other full-time members and result in dividing the board rather than uniting it.
- (2) If part-time members are to be consulted because they know those who will be selected, the

(57) Report of the Advisory Committee on organisation, N.C.B. Jan. 1955 para 62 and 63

weakness is that naturally the Chairman, Deputy-Chairman and other full-time members are expected to know those individuals better than part-time members, since full-time members spend their whole time serving the enterprise and knowing closely those individuals. The criticism is particularly true if the principle of 'from within the industry' is applied, unless the Minister thinks of appointing an outsider it could be desirable to consult any of the part-time members. But as a rule it is certainly unadvisable. The Political Quarterly concludes its criticism of the method by saying 'it is strange indeed that the voice of the part-time members should be sought in making the highest appointments.(58)

The proposal of consulting a group of experts in appointing part-time members is based on the idea that such intermediate channels are supposed to make up, in view of the Minister's limited knowledge, a panel of names submitted by the representatives of the consuming public, trade unions etc. The Acton Society Trust, while it disagrees with the Appointing Trustees

of the L.P.T.B., suggested a permanent appointing commission to help the Minister in this task. The concept is similarly based on the idea that the Minister who is fully occupied is bound to be limited, both in his knowledge of possible candidates, and in the number of such candidates he has time to approach.(59)

A more practical method is given by Simon. He says that if the Minister is to make a wise appointment it is essential that he should, with the help of his advisors, know rather intimately the personalities and the problems of the board. This may happen by close relations between the Minister, his senior officials, the Chairman and leading members of the board, not only by formal meetings, when necessary, but by a good deal of informal contact. 'In appointing a full-time member the Minister should ask the existing board for advice no doubt through the chairman. If he finds that the whole boards - Chairman, executive and part-time - are unanimously in favour of a certain nomination, then, so long as he has confidence in the Board, he would naturally accept that nomination.(60)

A similar method is proposed by a Labour Party publication by which the Minister should seek the advice

(59) Op.Cit. The men on the boards No. 4. 1951 p.18

(60) Simon of Wythenshawe, Lord The boards of nationalised industries 1957 Hanson, A.H.(ed.) Nationalisation p.193.

of the Board in selecting a new full-time member, because the Minister who appoints the chairman and members should have sufficient confidence in that board to ask their advice. In this respect Professor Robson thinks that it may or may not be true that the Minister who appoints the chairman and members should have sufficient confidence in that board. The Minister in office is not often responsible for the existing members of the board concerned or some of them. And even if he does appoint them he may not be satisfied with the result which may change his opinion. For these reasons the Minister should be left free to consult whoever he considers will give him the best advice.(61)

To this school of thought belongs the Herbert Committee which considers the statutory requirement under the Electricity Act of 1947 to consult the Central Authority before making the appointment of the full-time members as 'unnecessary, damaging to morale and suggests that it should be abolished. The Committee also recommends that the Minister should be left free to consult any authority or individual he considers necessary for nominations.(62)

(61) Robson, W.A. Op.Cit. - p.220

(62) Op.Cit. para 319.

The discussion above shows a wide difference among points of view. From the analysis of these views one could argue that the concept of consulting part-time members in appointing full-time members seems to be unpracticable owing to the disadvantages examined above. Other permanent intermediate channels as suggested by the Acton Society Trust are also unfavourable, because they are not expected to be fully aware of the industry's problems, especially internal. But, on the other hand, the Minister cannot be left completely free to select the members. The reason is that the numbers nominated by him are so great that no one individual can know intimately such numbers to select the most suitable person. Thus the method of Simon which implies that the Minister should consult the existing board for full-time nomination can be adopted. The only modification to this method is that it is not necessarily that the board should be unanimously in favour of the new member, because it is not practically easy to find the whole board unanimously in favour of a certain individual. This is one of the human problems. Thus if the majority of the board are in favour of a certain appointment, the author thinks it will work well.

It is right that the Minister in appointing a full-time member may consult informally the Chairman of the board concerned. The Chairman in turn may take the advice of the other full-time members. The effect of this method is that the Chairman and full-time members know from the reports of the senior officers in the industry the best man who could be promoted and this will to a greater extent ensure a harmonious board. The Chairman, the full-time members and senior officers in the industry would know very well the new member and be happy with his views and talent.

For part-time members, one could adopt what is already applied in the British electricity supply industry. The Chairman of the board makes a suggestion to the Minister of one or two people who will provide the necessary balance of qualifications at the board.(63) This is emphasised by the evidence of the Select Committee which shows that the majority of recommendations for selecting part-time members comes from the Chairman.(64)

In Egypt the procedure of selecting board members of public enterprises has a different history and at

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- (63) Select Committee on Nationalised industries
Electricity supply industry, Minutes of Evidence
May, 1963 Q.71
- (64) Ibid. Q.81

present is laid down by different legislation from the British methods.

When most private enterprises came under public ownership in 1961, it was difficult for the appropriate Ministers to undertake the appointment of the members of the whole public enterprises' boards. So it was stated in the nationalisation laws that the President of the Republic would issue a Republican Decree indicating the establishment of a competent Administrative Authority. One of the functions authorised to this Authority was to relieve the old managing director, Chairman of the board of directors and some or all members of the board of any of these newly nationalised undertakings and appoint a provisional board, a managing director or a delegate having the powers of a board of directors pending the appointment of a new board. The Authority was also authorised to relieve any of these new Directors or boards and appoint another.

The objection against this method may be the same as that made against the permanent intermediate channels suggested in the British case. But, it may be claimed in supporting this method that the large number of companies which had to be nationalised made it impossible for the Minister concerned to do the

nominations even with the assistance of advisors he wanted to consult. The Administrative Authority was the only solution to deal with a long list of companies of various types, aims and sizes. After the re-organisation of public undertakings which classified them under groups, each group of industries concerned with one economic activity, and supervised by a competent Minister,(65) it may be desirable to give the Minister the power to select the members after consultation with the existing board of the industry concerned, as suggested in the British example. But it would be impracticable to apply this method on such a case where the Minister supervises nine public organisations controlling 168 public companies,(66) each having a board of Directors consisting of seven members. In this case a permanent committee is important.

In other examples in the Egyptian public enterprises the appropriate Minister has a statutory power to nominate or sanction the appointment of members. For example, in a Decree amending law No. 71 of 1961 organising the Cotton Exporting Organisation, the Minister of Economy with regard to the said Organisation can

(65) Appendix 5

(66) Appendix 5 as in the case of the Minister of Industry.

relieve the managing directors from their duty and appoint a temporary board or a managing director or a representative with all the powers of the board of directors. Another example is found in the case of the first Commercial Bank established by the Government. The law concerning this bank states that at least three members of its board must be Government representatives. The nomination of them, the managing directors and the president of the board are sanctioned by the Minister of Finance. There is no evidence about the procedure of their appointment.

The President of the U.A.R. is another authority in appointing members of some public boards, for example, members of the E.D.O.'s board are chosen by him. Also public companies in which the E.D.O. owns more than 25% of the capital, the president of each of the company's boards or the managing directors or director general are nominated by the President of the Republic. The procedure of nomination is that the President of the Republic shall take his decision from among three candidates chosen by the board of the public company, and also he shall take the opinion of the E.D.O.'s board.(67) It would not be practicable

(67) Appendix 2 Article 12.

for the President of the Republic to have the time to exercise this authority. Perhaps the Chairman of the E.D.O., who is a Minister, makes these appointments. But in the case of the E.D.O. itself, the President of the Republic may select at least the Chairman who is a Minister.

Whatever happens in practice it is shown here that consultation with the existing board of the industry concerned, no doubt through the Chairman, is adopted in some of the Egyptian public enterprises. One should conclude that this is the best method of selection of members.

Powers of the boards.

Once the Board is appointed by any of the methods discussed in the previous section, the question arises whether the board will be free in exercising its functions, and why it should or should not be free. In Britain, it was thought that the creation of the public corporation would ensure the autonomous operation of the boards, free from ministerial and parliamentary comprehensive control. In fact, from the very start the legislation which controls public boards had not given complete independence to the management of these enterprises. One exception could be recorded, that is

the case of the Port of London Authority which was immune from such control. The pre-war corporations such as the London Passenger Transport Board or the Central Electricity Board had not much more autonomy than the post-war ones. The general reason, however, which may be given for such control is the desire of the Government through the Minister to use these industries to assist in the planning of national investment or to participate in the economic stability of the country.(68) The national interest is an important factor in this intervention.

This growing limitation on the board's economic activities has narrowed the gap of the traditional difference between the Government department and the public corporation. Another reason for narrowing the gap is the relations between the Minister and the Chairman of the public corporation's board, if it is as confidential as between the Minister and his Under-Secretary. Professor Robson observes that there must be something seriously wrong because a similarity between the board's Chairman and a permanent head of a Department has never been intended.(69)

(68) Discussed in detail in Chapters 3 and 4.

(69) Robson, W.A. Op.Cit. p.144

The main reason for these fears about the autonomy of the British public corporations is the increasing powers of the Minister concerned. The Minister has statutory powers specified by the Acts as well as powers given to him under the term national interest which can use whenever he wants. In addition the Minister also uses informal contact with the Chairman of the board to whom he wants to give directions. The result of these powers will leave very little to the board's discretion. A.H. Hanson states in this context that a listing of the formal powers, general and specific might give the impression that there was little that the industry could do without consulting the Minister or obtaining his approval at one stage or another.(70)

Following the argument about comparison between the public corporation and Government department, there are the day-to-day affairs in which it may be claimed that the public corporations have complete freedom or at least more freedom than a Government department. For example, in the electricity supply industry, the decision whether to install a certain kind of turbo-generator or a certain kind of switchgear or other

(70) Hanson, A.H. Parliament and public ownership
London 1961 p.39

matters affecting the location of power stations should be resided within the Board's discretion. But even here there is a fear that the Minister interferes in the day-to-day affairs of the public corporation. This has been, observed by the Economist when discussing the expected relationship between the Chairman of the railway board and the new Minister. They say that nationalised industries are managed from day-to-day by professionals several of whom have been specially picked for their known intolerance of outside interference. Although the Economist emphasised that the Chairman of a nationalised industry's board is virtually immune from ministerial interference in day-to-day affairs, they show the strong position of the Minister regarding these activities by saying 'in a clash of views on policy a Minister has only two ways open to him of making the Chairman of a nationalised industry do what he does not want. One is to give the Chairman a written order to do it, the other is to find a new Chairman.(71)

However, the question now is, why Ministers have this strong position over the activities of the public boards in Britain. There is a school of thought which strongly favours the complete independence of a public

(71) The Economist 24.10.1964

board. They regard the Minister as a layman who is unlikely to compete with the board and its officers in the expert knowledge of their operation. According to Frank Milligan, this opinion under-estimates the influence of the permanent officials who advise the Minister, and they over-estimate the foolhardiness of the Ministers.(72) The role of the Minister is proved by the general philosophy of nationalisation which is based on the assumption of public interest in these undertakings. It may concern investment, employment policy or the effect of the public board's activities on health and public welfare or strategic questions involving output capacities and services. If the shareholders in private enterprises look after these interests, theoretically or in practice, we have to have somebody to replace the shareholders. This must be the Minister. In serving the public and contributing in the decisions of policies mentioned, the Minister has powers, limiting the board's movements which could be classified in three categories.

(72) Milligan, Frank. Ministerial control of the British nationalised industries, Canadian Journal of Econ. and Pol. Science
Hanson, A.H. (ed) Nationalisation, p. 283

- (1) Statutory powers clearly defined in the various Acts.
- (2) Powers expressed as the right of the Minister to give general directions in the national interest, and
- (3) Informal powers by which the Minister gives directions to the boards by unofficial means, such as telephone calls, discussions with the chairman etc. But usually these directions are given under the term 'national interest.' To limit the discussion it will be dealt with in the first two categories.

Specific statutory powers.

On exercising these powers the Minister may choose one of two ways. Either to leave the actual operation of these functions to the board concerned assuming that he has complete confidence in their ability or he may supervise the operation himself or via his subordinates. In the first case his role is just to sanction the Board's decisions but in the second case he scrutinizes these decisions. This, of course, depends wholly on the Minister's own way of dealing with such matters. However, it seems that Ministers do not usually try the first way. The

statutory powers of the Minister vary in number and degree of importance from statute to statute, but on the whole they cover most of the industry's aspects.

Examples of these are:

- (1) One of the important powers which the Minister possesses is that of approving plans for the re-organisation of the industry concerned, especially when they involve a substantial capital expenditure. This includes not only the central re-organisation but also regional ones as in the gas and electricity industries. Under the coal industry nationalisation Act of 1946 it was stated that in framing a programme of re-organisation or development involving substantial outlay on capital account the board shall act on lines settled from time to time with the approval of the Minister. Similarly under the Transport Act of 1947 the Minister's approval must be given from time to time to the Commission's general lines of re-organisation and development.(73) The same power applies to the electricity supply industry, whereas under the Electricity Act of 1947 it is the Minister's

(73) Hanson, A.H. Parliament & public ownership
London 1961 p.35

responsibility to determine questions about the exact boundary of an Area. He also has the power to vary, create and amalgamate Area Boards.(74)

- (2) Programmes of pension schemes, training, education and research are some specific aspects which must have the approval of the Minister. It should be noted that while some Acts such as coal and transport require ministerial approval, others such as electricity only require consultation between the Electricity Council and the Minister.
- (3) Financial control. It is the Minister's power usually in conjunction with the Treasury to control all financial matters of public boards. The Minister and the Treasury retain annual control over the board by fixing the sum available each year for capital development. In the Government's view, long term statutory limits of borrowing powers are essential for planning the investment programmes demanded by great development schemes. In the British electricity supply industry the Minister of

(74) Op.Cit. Section 4 (2)

Fuel and Power and the Treasury have powers covering nearly the whole policy of finance and investment. This could be seen from a listing of these powers given by the Select Committee on nationalised industry.(75)

Powers for the national interest.

There has been much said about this point in Britain. The main criticism of economists against this statutory power is that the 'national interest' is a vague term. The Minister can intervene in the Board's affairs under this statutory power. The nationalisation Acts make it clear that the Minister concerned has powers of general character in relation to matters which appear to him to affect the national interest. The traditional theory is that since the Government is responsible to Parliament, all regulations for the public interest must be performed by the head of one of the Departments of State, in order that he may be made answerable to Parliament for what he does. The question here is how far these powers affect the economic decisions of the public board.

(75) Select Committee on Nationalised industries, the electricity supply industry May, 1963 Appendices 64 p.262

Statutorily the Minister can amend, modify or disapprove any policy initiated and formulated by the board for the national interest. Many examples of interventions, under this statutory power could be found in the Reports of the Select Committee on Nationalised Industries. The Committee Reports on Airways, (76) Railways (77) and the Electricity supply industry give evidence of such intervention.

In the electricity supply industry ministerial intervention in the national interest is applied as in any other nationalised industry. Moreover there has been an agreement for some years between the Minister and the boards by which the latter should give the Minister notice of proposed changes in their tariffs. The object is to enable the Minister to express to the Area Boards any views which the Government may have on matter of national interest. The Area Boards in turn should give effect to such directions.(78)

The increasing formal and informal powers of the Minister and consequently more limitations on the board's freedom may result in uneconomic decisions.

(76) May, 1959 H.C. 314 para 215, 217, 218.

(77) July, 1960 H.C. 254 para 75 & 76.

(78) Select Committee, H.C. 236 - II May, 1963 Q 277

Examples in all the British nationalised industries are reported by many economists and other authorities. For example, it was reported that there have been two occasions in the electricity industry at which the Minister interfered, in 1957 and 1958. In the latter occasion the Minister asked for a reduction in the bulk supply tariff, at the time when the Government was anxious to keep prices down for consumers. This resulted in a reduction in revenue by £2 million.(79)

It must be mentioned in connection with this problem that limitations on the Board's powers apply on central and regional ones. To give an example, in the electricity industry though Area Boards are by statute autonomous in character they are restricted in their activities by pressure from three sources. First, the Minister has the right to give general direction to any Area Board. Second, the Electricity Council controls most of the Area Boards' activities according to the Council's own opinion or by transmitting the Government's view and, third, the Consumer Consultative Council can also have, legally, an effect on the Area Board's policy. Under the

(79) Select Committee on Nationalised industries, electricity supply industry May, 1963 Q.1416.

Electricity Acts 1947 and 1957 a Consultative Council could make representations or reports to an Area Board. If the Area Board does not give effect to such reports the Consultative Council can ask the Electricity Council to persuade the Area Board concerned to remedy the defect. If this will not have the expected result the Consultative Council could lay the matter before the Minister. The Minister can directly give directions to the board if he thinks it necessary to solve the problem.

One could conclude that if all these limitations on the Board's activities exist in practice, then it would be true that freedom of the public corporations are limited to the extent of narrowing the gap between the traditional freedom of the public corporation and the Government Department.

Conclusion.

In this chapter many problems concerning the members of the public Boards have been examined. The most important points of this discussion are:

- (1) In the whole set of public boards in Egypt and Britain, the boards have different aims. Some of these boards have similar aims in Egypt and in Britain, but others are only found in Egypt, such as the Economic Development Organisation.
- (2) It is wrong to fix the size of all boards because number of members should be related to the nature of the industry. It is also wrong to fix the size of one board because this would damage the flexibility of increasing or decreasing the number of members according to the industry's activities.
- (3) Acceptable qualifications of the members should be stated to suit the nature of the industry.
- (4) The most important source from which to select full-time members is the industry itself. In exceptional cases where no suitable qualities are available in the industry, the appointing authority should try in other nationalised industries and lastly in large-scale private enterprises.

- (5) Representation of workers in the constitution of the Board should be carefully studied. Consumer's representation seems to be ineffective at the present time. The increasing of consumers' vote at the board is important.
- (6) Members of Parliament are rightly disqualified from being members on the Boards in Britain which should be followed in Egypt. But, while by the very nature of the British public corporation Ministers are disqualified from being members, it is, in some Egyptian public enterprises, essential to let Ministers head the Boards.
- (7) It is preferable that full-time members should not have functional duties. These duties should be left to senior officers and heads of the departments in the industry. Also full-time members should not occupy other external jobs. The role of part-time members is important provided that they give sufficient time to discuss the industry's problems.
- (8) Although intermediate channels, such as a procedure of appointments of members, have been strongly criticised in British public

corporations, it has been proved that it was a reasonable method of appointing members of a great number of nationalised industries in Egypt.

The best method for selecting full-time members should be through the chairman of the board concerned, and an informal contact between the Minister concerned and the Chairman. But in consulting the Chairman and the existing board members for a new appointment it is not necessary to get full agreement of the whole board.

In contrast with the British examples, the President of the Republic of Egypt is one authority in appointing the Chairman of some Boards.

- (9) The powers of the Minister over the British public boards should be confined to his statutory powers. Other formal powers under the term 'national interest' should be clearly defined. And lastly, day-to-day affairs should be left completely to the public board in order to emphasise the idea of the public corporation's creation.

CHAPTER III.

PROBLEMS OF PLANNING.

INTRODUCTION.

Problems of planning.

In the previous chapter an examination of the structure of boards in public enterprises has been made. We arrived at conclusions about the suitability of men to run these boards successfully. In this and the following chapter some of the problems of public enterprises will be examined with which these boards have to deal. Special reference will be made to the electricity supply industry in Britain and Egypt.

There is no doubt that the aims of every economic organisation are to satisfy the needs of its consumers. To do this, the organisation must first of all plan for the construction of projects necessary to meet the demand for its products.

To plan for these projects the board faces many problems. Two of them will be investigated in this chapter, these are: manpower planning and financial planning. To examine these two problems the author feels that it is necessary first to explain the importance of formulating plans, methods of planning and the projects which are planned to meet the consumer's demands, especially with regard to electricity supply industry in Britain and Egypt.

Generally speaking, the object of economic planning anywhere is to use the national resources in the best interests of the nation. For this Governments of developed and under-developed countries are required to frame and carry out comprehensive policies, involving a considerable degree of direction and regulation of economic activities. The scope of governmental action in under-developed countries must be more than in developed countries. This is due to the weakness of the private sector in carrying out certain important plans. In Egypt, for example, the national planning policy aims to double the national income every ten years. The main planning principle is to distribute investments among the various sectors in the economy in such a manner as to produce the highest possible yield, after a certain period of time, which the private sector cannot afford. The planners, for instance, decided to direct a part of the society's income away from expenditure on consumer goods and services to invest in productive capital goods. This, in underdeveloped countries, must be done mainly by the Government.(1) In Britain, nationalisation is one of the effective tools in carrying out the

(1) Full details on the five-year plan 1960/65 in Egypt is explained by Issawi Charles, Egypt in Revolution London 1963 p.69

government's plans because of the effective role of the Government in formulating the nationalised industries' plans. In carrying out their plans public boards have to give consideration to the Government's policy. This is clear from the nationalisation Acts, which require that nationalised industries should supply adequate service to the public. To do this every public board has to plan its policy programmes well in advance to ensure the provision and maintenance of an efficient public service in future years. Programmes with social and economic implications should be adjusted as much as possible to the social framework within which it will take place. In doing that the industries sometimes plan for uneconomic projects, rural electrification being an obvious example.

Planning in the electricity supply industry involves many problems. Electricity authorities must start with a prediction of the probable demand, which will arise from new consumers to be connected and the increasing demand of the existing consumers. This is not only a public regulation in most countries but also a duty, if the industry is nationalised, to the public to be served.(2) So electricity authorities are required

(2) Bellamy, D. The consumer, the creator of demand - the next five years, Electricity Council 1962 p.5.

to make the necessary planning to meet this growing demand.

Planning schemes in the electricity supply industry are based on a number of specific purposes. For example, there is short-term planning for the operation of existing plants, middle-term for the provision of new plants and its capital and personnel problems, and long-term planning for the future advancement of new technologies, location of generating stations and their types, the main transmission lines, especially those for long distances and also financial and personnel problems of these projects.(3) According to this classification, the time required for implementation of these schemes varies from six months or one year in the short-term, six, seven or eight years ahead in the medium term and probably twenty or more years in the long-term planning. Moreover the difference between these terms is due to the type of work expected to be done. Short-term is for the maintenance and re-inforcement of the supply system, middle term is required for the design, construction and commissioning

(3) Melling, C.T. Long-term planning for electricity supply. An address given to the Royal Institute of Public Administration November, 1963 Electricity Council Pamphlet p.6.

of generating stations and long-term is required for establishing a grid or super-grid system in the country.

These plans for supplying more electricity exist not only because the expected demand is growing fast but also the electricity industry, as a commercial undertaking, has an interest in increasing the number of consumers and selling more to the existing consumers. In both ways the industry can expand.(4)

To plan for expansion in the electricity supply demand we have to look at the general standard of consumption in the country, consumption per capita, and the consumption of category of consumer. This can give us a general background to the situation in the country as a step towards the necessary planning. If we know these points in detail we can plan for projects aiming at achieving better standard in consumption per head. The history of electricity consumption can give us an indication of the rate of increase in consumption, but for future plans we have to review demand periodically owing to the expected changes. Methods of estimation will be examined from British experience.

(4) Logan, E.A. Planning to meet the load.

Summer school of the Electricity Council 1962 p.56

Electricity consumption: general survey.

The production and distribution of electricity throughout the world has increased and is increasing at a high rate. In both Britain and Egypt, electricity consumption has increased markedly. In Britain, Table 1 shows the growth in number of consumers and consumption of electricity in Britain between 1920-1962/63.

The table shows that numbers of consumers have increased more than 16 times within about forty years and units sold have increased about 30 times. But the percentage of increase of units sold was much less in correspondence with the percentage of increase in numbers of consumers from 1925 to 1951. From 1955 to 1959 percentage of increase in units sold was above the percentage of increase in numbers of consumers due to the increase of consumption per consumer as shown in Column 3, and as illustrated in Figure 1. In fact, consumption per consumer shows an obvious decrease from 1925 to 1951. Columns 6 and 7 show no growth of average annual consumption from 1925 to 1935 due to the well known depression. From 1940 to 1951 there was a slight growth as it was war time and then the situation has improved from 1955 to 1959.

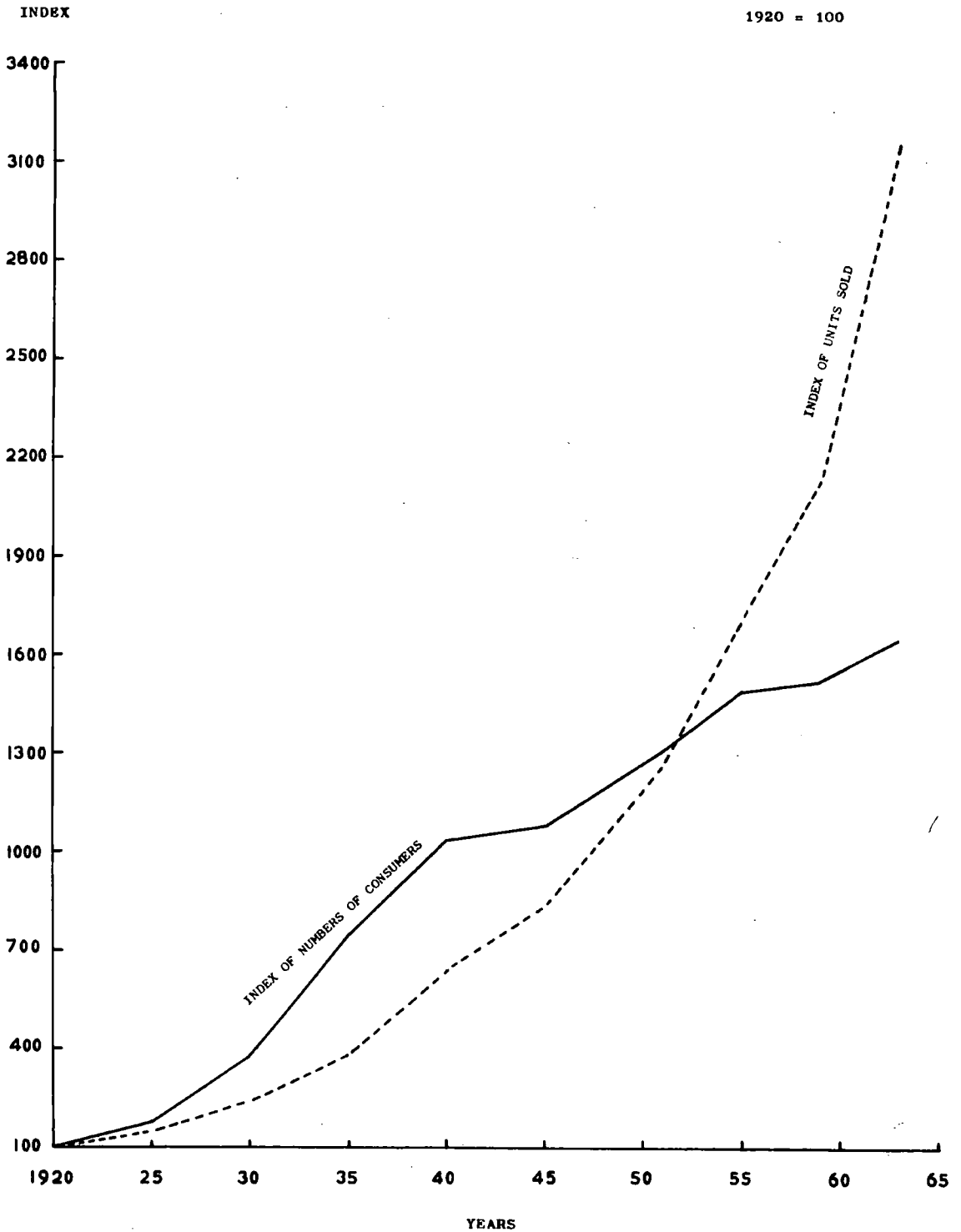
TABLE 1.
GROWTH OF NUMBERS OF CONSUMERS AND CONSUMPTION
OF ELECTRICITY SUPPLY IN BRITAIN.

Year	Number of Consumers in all classes		Units sold		Units supplied per Consumer	5 year growth Million units sold	Average annual growth	5 year growth per Consumer	Average annual growth per Consumer
	Million	Index 1920=100	Million	Index 1920=100	+				
1920	1.0	100	3660	100	3660				
1925	1.8	180	5585	153	3103	1925	385	-577	-111
1930	3.8	380	8930	244	2350	3345	669	-753	-151
1935	7.5	750	14290	390	1905	5360	1072	-445	-89
1940	10.4	1040	23775	650	2286	9485	1897	381	76
1945	10.8	1080	30601	836	2833	6826	1365	547	109
1950-1	13.1	1310	46580	1273	3556	15979	3196	723	145
1954-5*	14.9	1490	62410	1705	4189	15830	3958	633	158
1958-9*	15.2	1520	78098	2134	5138	15688	3922	949	237
1962-3*	16.4	1640	115517	3156	7044	37419	9355	1906	477

+ Units supplied per consumer are the result of dividing units sold by numbers of consumers, which is different than consumption per capita. Numbers of consumers are the people who foot the bill. Consumption per capita is to divide the whole consumption by the population.

* Four years growth.

FIG. 1 THE RELATION BETWEEN INDEX IN NUMBER OF CONSUMERS AND INDEX OF UNITS OF ELECTRICITY SOLD BETWEEN 1920 - 1962/3 IN BRITAIN



During 1963-4 numbers of consumers have increased to 16,648,096 (in England and Wales). Sales of electricity during the same period amounted to 121,524 million units. The rate of increase in units sold depends, in Britain, to a greater extent on the weather, for instance, in 1962-63 the increase in consumption was 11.4% while in 1963-64 the increase was much lower at 5.2%. This was a result of the contrast in weather in those two years.(5) Future consumption of electricity is estimated to be increased by 10% per annum to achieve a figure of 230,000 units by 1970.(6)

In Egypt there is no comparable figures of growth of numbers of consumers and consumption of electricity, but growth of consumption could be illustrated by the increase of electricity in production.

In Egypt, electricity production has also increased at a high rate. As early as 1936 the whole installed capacity was 194,000 KW generated from 75 power stations (15 in Cairo of 87,500 KW, 5 in

(5) Electricity Council Annual Report and Accounts 1963-64 para 50.

(6) Marsh, N.F. Electricity and Economic Growth, Electricity Council 1964 p.2.

Alexandria of 44,400 KW, 26 in lower Egypt of 39,700 KW and 27 in Upper Egypt of 23,200 KW.)(7) From 1954 to 1962 the production of electricity in Egypt has increased by more than 11% per annum. The following 2 tables can illustrate this increase. Table 2 shows the evolution of production (without the contribution of the Aswan Dam hydro-electric which is confined to supplying the Kima fertilizer factory and the construction of the High Dam project.)

TABLE 2.

GROWTH OF ELECTRICITY PRODUCTION IN EGYPT
WITHOUT THE CONTRIBUTION OF THE ASWAM DAM
HYDRO-ELECTRIC.

Year	Installed capacity	Generated energy		Annual load factor
	M.W.	M.K.W.h.	% increase	
1954	469	1247		60%
1955	565	1422	14.0	60%
1956	596	1548	8.9	62%
1957	723	1712	10.6	63%
1958	784	1905	11.3	63%
1959	827	2125	11.6	64%
1960	874	2388	12.4	65%
1961	963	2709	13.4	65%
1962	963	2939	12.2	66%
Average			11.8	63%

(7) The Vienna Sectional meeting of the world power conference, Engineering 1938 Vol. 146 page 454.

It can be seen from this table that generated energy has been increased at an average rate of 11.7%, the annual load factor at an average of 63.1%. The reason for a low load factor is due to the lack of a grid system, so that generating stations are not yet fully interconnected. All the stations have to keep a higher reserve capacity.

With the inclusion of the Aswan Dam production the following Table 3 and diagramatically in figure 2 shows the evolution of generated energy of the whole country classified according to the type of producers.

The table shows an increase of supply from 1247 M.K.W.h. in 1954 to 4,100 M.K.W.h. in 1962. It could be also noticed from the table that though the total energy generated has nearly trebled in the whole period under discussion, yet the energy generated and supplied by the Cairo Electricity and Gas Administration has increased nearly four times, because the area served by this Organisation is the main centre of consumption in the country. Generation by all producers has been slightly more than doubled. Estimation of electricity production in 1965 will be 6400 M.Kw.h. and after the full utilisation of the High Dam will be approximately 16,500 M.KW.H.(8)

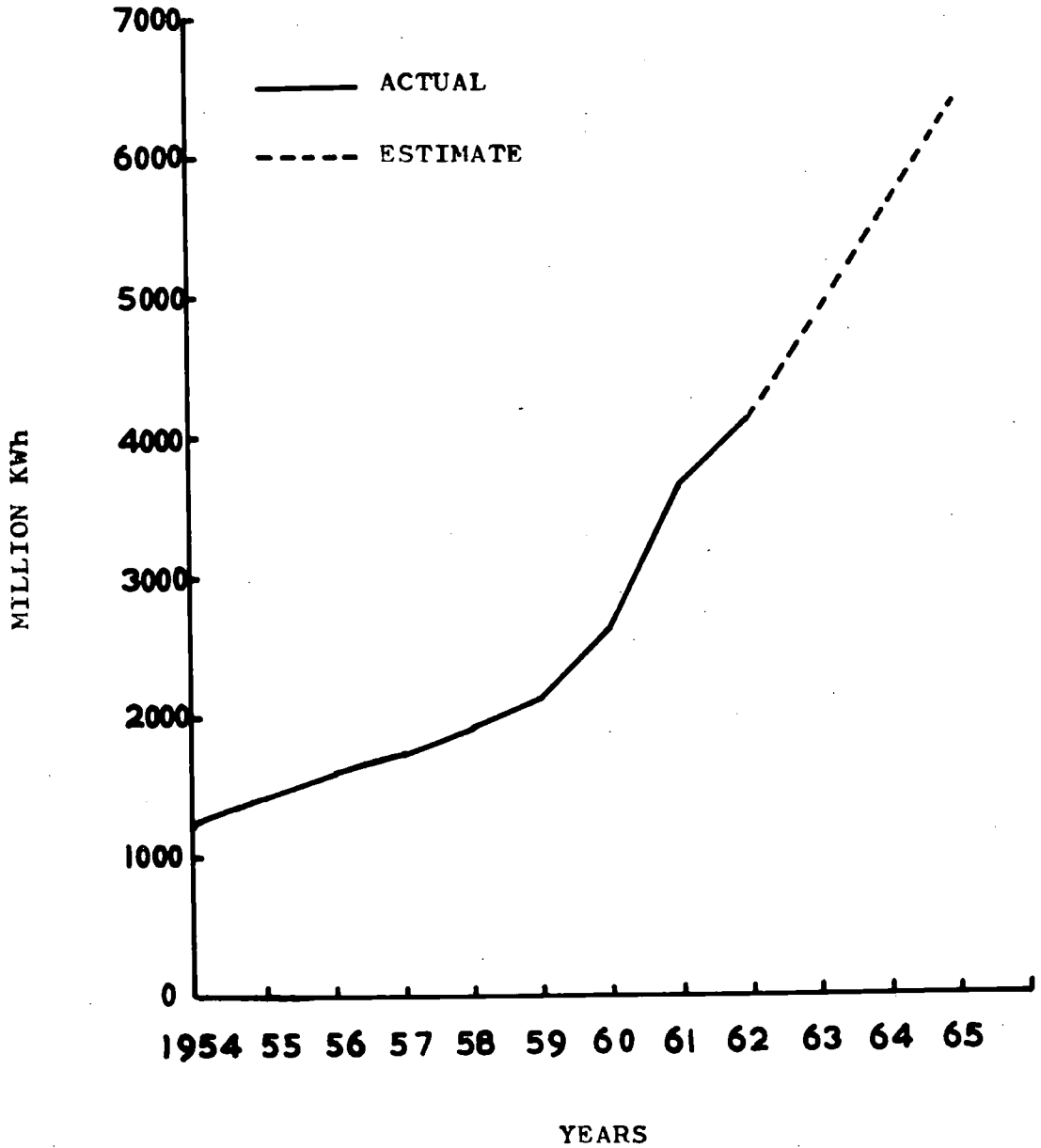
(8) U.A.R. General Congress of the National Union, the five year plan for the economic and social development of the U.A.R. 1960-65 Cairo 1960 p.35

TABLE 3.

EVOLUTION OF GENERATED ENERGY IN EGYPT MILLION K.W.h.

No.	Authority	1954	55	56	57	58	59	60	61	62	%
1	Cairo Electricity Gas Administration	221	263	356	426	520	617	794	927	1051	376
2	Nationalised Societe Egyptienne d'Electricite	178	200	183	197	209	217	199	195	220	24
3	Alexandria Electricity & Gas Organisation	184	211	226	259	291	303	332	466	452	146
4	Municipalities	97	107	111	110	104	102	111	112	102	5
5	Independent Electric Power Stations (Utilities)	82	94	96	86	83	86	92	89	73	-11
6	Aswan Dam	-	-	-	-	-	-	250	1003	1161	364
7	Mechanical & Electrical Dept. Mainly Irrigation & Drainage	79	100	108	117	140	183	212	238	300	280
8	Industrial Companies	406	447	468	517	558	617	648	682	741	83
9	Total of U.A.R.	1247	1422	1548	1712	1905	2125	2638	3712	4100	229

FIG. 2 EVOLUTION OF ENERGY GENERATION IN EGYPT
1954 to 1962 AND ESTIMATE 1962 to 1965

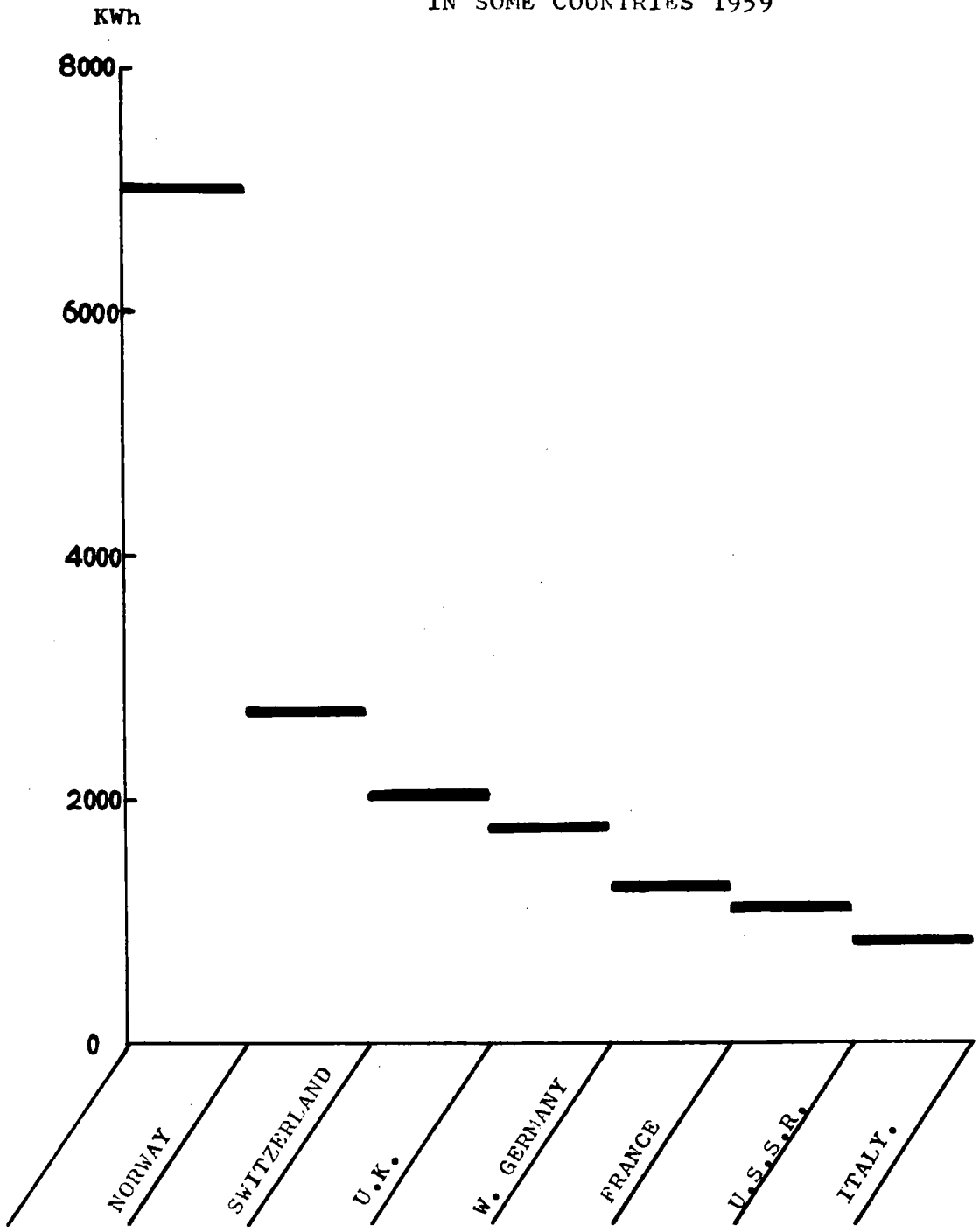


Though the analysis shows that figures are not precisely comparable they show that in both countries especially after 1954 production and consequently consumption of electricity have increased considerably.

Consumption per capita.

The average consumption of electricity per head provides a measure for comparing in different countries. Consumption per head is influenced by such factors as size of population, climate, the standard of living, degree of industrialisation and the potentialities of the country. The latter factor is one of the main elements which favours countries with hydro-electric power resources. This could be shown from a comparison, done by the Electricity Council 1960/61, between groups of countries including Britain. From Figure 3 it is seen that consumption per capita is at a higher rate in countries with large development of hydro-electric power such as Norway, and Switzerland. It could also be noticed that in spite of the abundance of cheap hydro-electric power in the countries mentioned, Britain ranks fairly high in consumption of electricity per head. It amounted to 2005 KWh per capita in 1959 and it is increasing at an average annual rate (from 1950 to 1960) of 10.5% as shown in Figure 4.

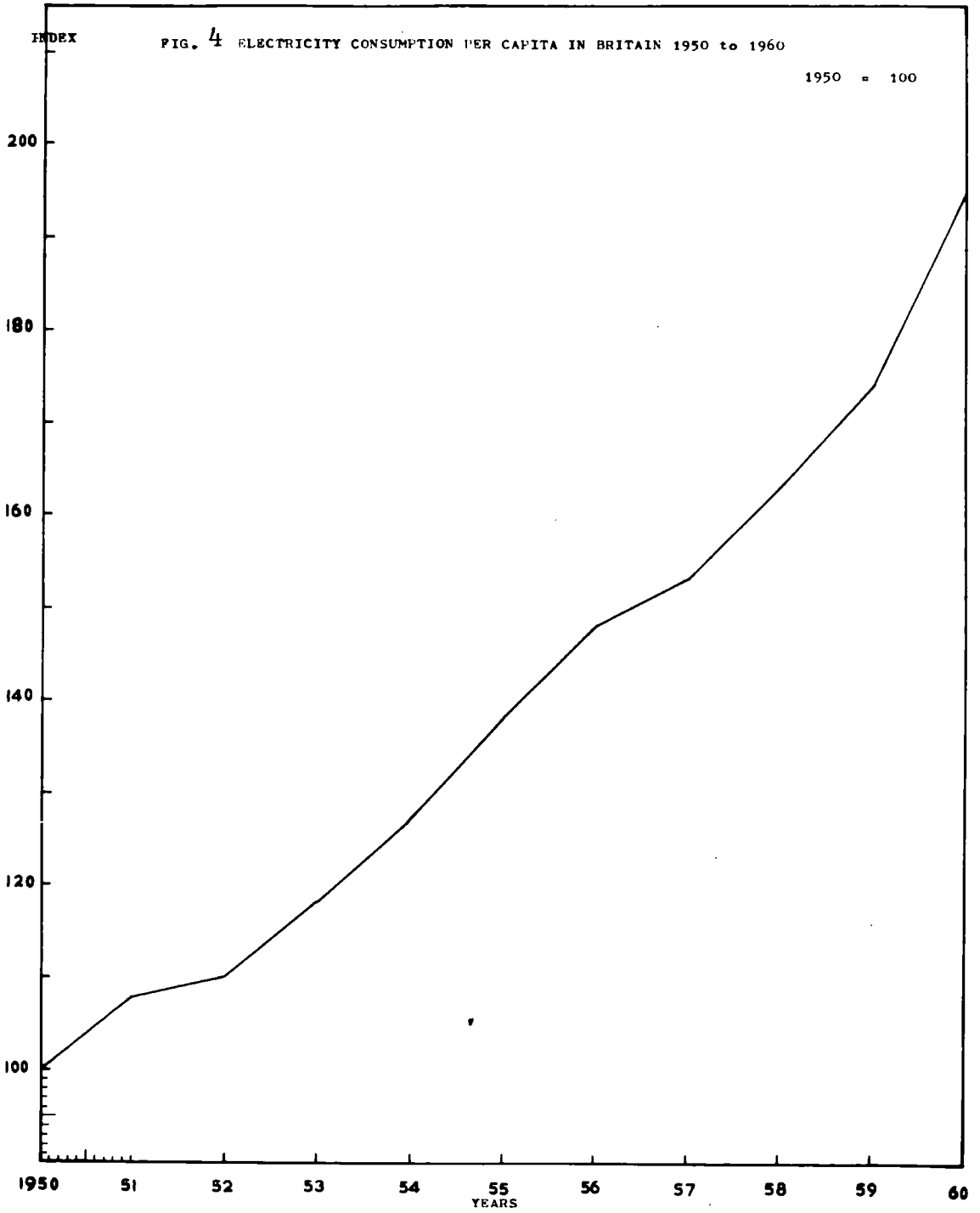
FIG. 3 THE ELECTRICITY CONSUMPTION PER CAPITA
IN SOME COUNTRIES 1959



INDEX

FIG. 4 ELECTRICITY CONSUMPTION PER CAPITA IN BRITAIN 1950 to 1960

1950 = 100



In Egypt consumption per capita has increased in the last decade at a markedly high rate, due to the industrial revolution in the country and the rise of the standard of living. In 1936 the average consumption per head was 20 KWh per year. After nearly 20 years, consumption per capita was 66 KWh.(9)

From the recent available data, Table 4 shows generated energy per capita from 1952 to 1962 and the estimated figures from 1965 to 1980.(10)

TABLE 4.
PER CAPITA GENERATED ENERGY IN EGYPT

Years	1952	1960	1962	1965	1970	1980
KWh.	47	102	145	210	350	700

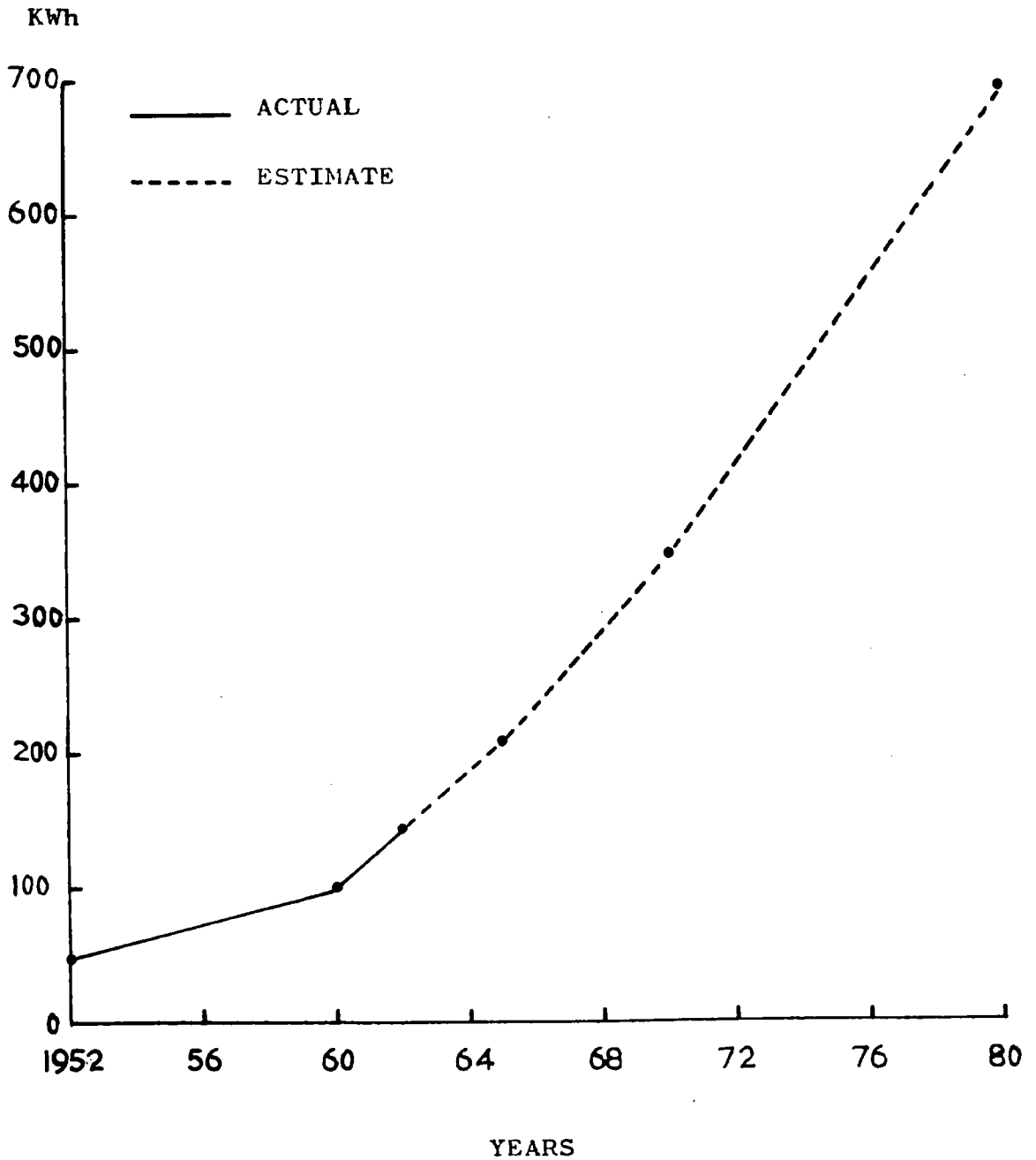
The noticeable feature in this table is the sharp increase in generated power per capita in the years from 1952 to 1962 which is at an average annual rate of 9.8%.

In comparison with Britain, it could be noticed that consumption per capita in Britain is much higher than in Egypt. For example, while in Britain consumption

(9) United Nations, The development of manufacturing industry in Egypt, Israel and Turkey, New York 1958 p.18

(10) Generated energy could be comparable with consumption, taking into account the percentage of transmission losses.

FIG. 5 PER CAPITA GENERATED ENERGY IN EGYPT.



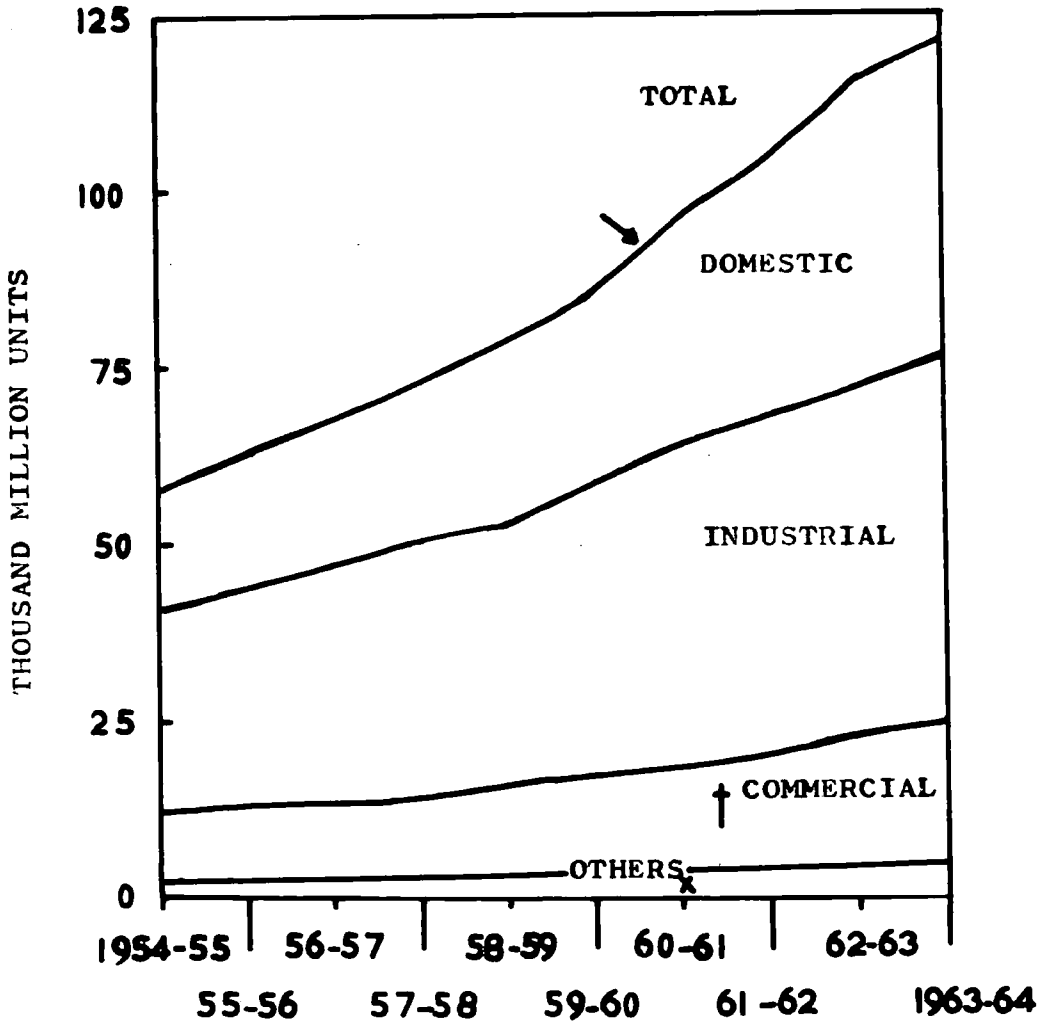
per capita in 1959 was 2005 KWh, in Egypt it was near 90 KWh per year. The average rate of increase in consumption per capita in Egypt is lower than in Britain. For example, in the eight years 1952-60 the increase in Britain was 9.5% (Figure 5) while in Egypt in the eight years 1952-60 the rate was 7%.

The average rate of increase in consumption per capita in Egypt, while it appears to be reasonable in a developing country, compared with a developed country like Britain, is, in fact, related to a greater extent to the new industrialisation schemes in the last decade or so, and other categories of consumers do not contribute much in this percentage. Details are discussed below.

Consumption by consumers' categories.

The planner in the electricity supply industry must know the role of each category of consumer in order to programme for plant expansion. The level of demand of each category and the expected increase by them are important for successful planning. This is because electricity requirements differ from one category to another. The capacity of a power plant, to be planned for, would differ greatly between a heavily industrial area and an area where commercial consumers

FIG. 6 ELECTRICITY SALES BY CLASSES OF CONSUMERS
IN BRITAIN



†

Includes combined domestic and commercial

×

Farms, public lighting and traction

or farming consumers are the dominant part. In Britain this could be described in a (Figure 6) showing the sales to the main classes of consumers during the last ten years (1954/55 to 1963/64). The planner may take also into consideration the important changes in the rates of growth of the different consumer classes, which have an effect on planning to meet these changes. Such changes in Britain are presented in Table 5.

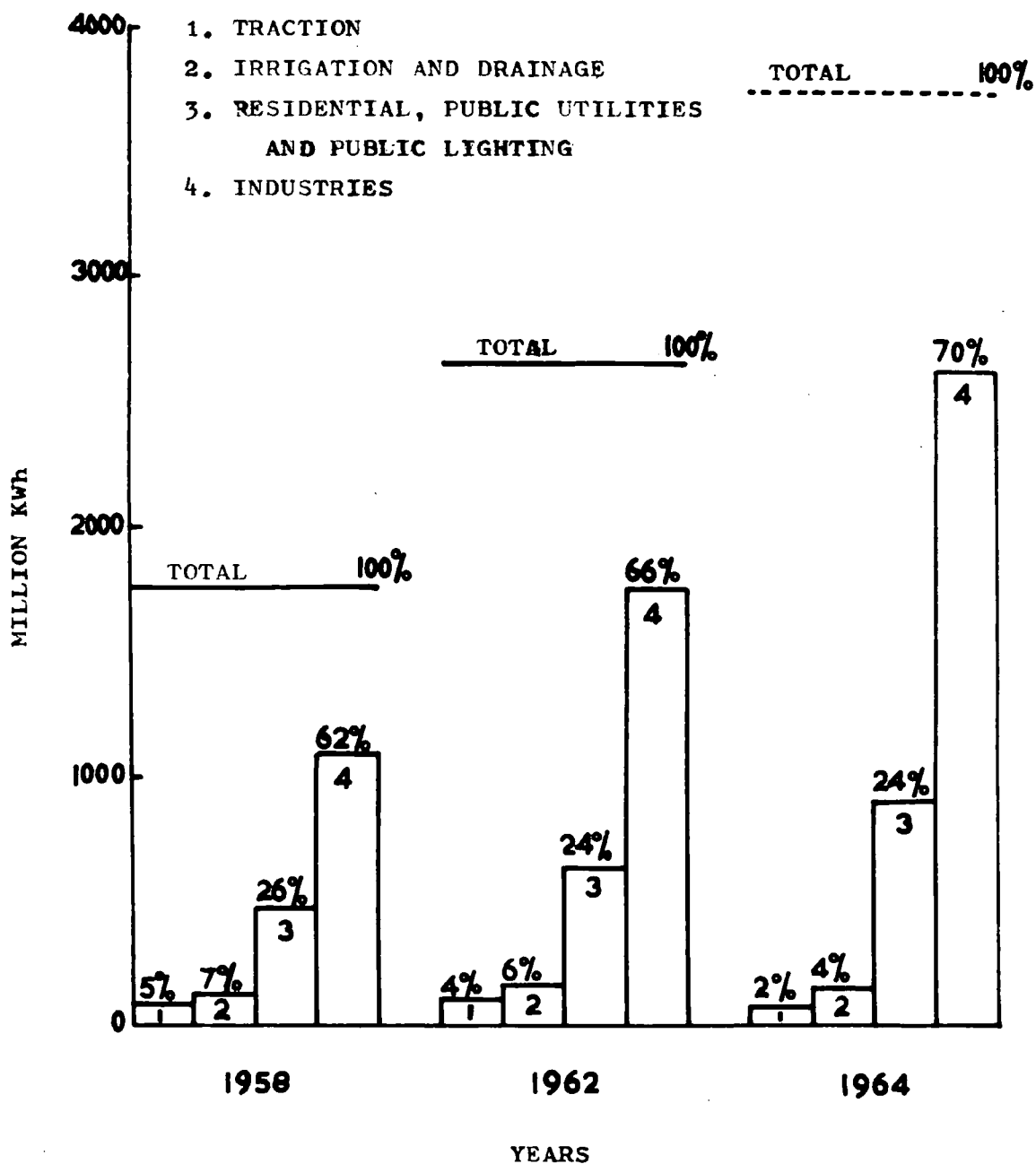
The table shows that during 1963/64 the rate of increase of domestic and commercial consumers was lower than in recent years, whereas sales to industry went up faster. Consideration of changes of this character is necessary for economic planning, assuming that there are some areas which are mainly industrial, commercial or domestic. Thus if it is expected that the standard of living is going to rise, there will be an increase in commercial and domestic consumption. This is a result of improvements in lighting and display facilities on the commercial side, and an increase in consumers' expenditure on the domestic side. The same proposition applies to the industrial sector. An expected expansion of certain industries, such as chemical, iron and steel and general engineering industries must result in an increase in electricity

TABLE 5.

UNITS SOLD TO CONSUMERS IN BRITAIN.

Consumer Classifi- cation	Units sold MKWh										Average annual increase in con- sumption over the period 1957/58- 1963/64	
	57/58	% of total	61/62	% of total	63/64	% of total	% increase over previous year					
						63/64	62/63	61/62	60/61	59/60		
Domestic	22108	30.4	35962	34.7	45158	37.2	3.6	21.2	13.7	17.6	7.9	
Farm	1279	1.8	1923	1.9	2303	1.9	2.8	16.6	7.3	18.3	1.2	
Commercial	9060	12.5	13103	12.6	16103	13.3	5.5	16.4	9.8	13.9	4.9	
Combined Domestic & Commercial	1032	1.4	1741	1.7	2081	1.7	3.5	15.5	10.5	14.2	9.6	10.9%
Industrial	37000	50.9	48443	46.7	53137	43.7	6.8	2.7	3.6	8.3	12.9	
Public Lighting	630	0.9	852	0.8	969	0.8	5.8	7.4	8.0	8.2	8.0	
Traction	1552	2.1	1661	1.6	1773	1.4	-6.6	7.4	5.4	1.8	2.3	
Total	72661	100.0	103685	100.0	121524	100.0	5.2	11.4	7.9	12.1	9.8	

FIG. 7 CLASSIFICATION OF ENERGY CONSUMPTION ACCORDING TO PURPOSES, (WITHOUT CHEMICAL FACTORIES IN ASWAN) IN 1958 AND 1962 AND ESTIMATE FOR 1964



consumption in areas where these industries are located or planned.

In Egypt the proportion of electricity consumption according to the main classes of consumers is shown in Table 6 and Figure (7).

TABLE 6.

CLASSIFICATION OF ENERGY CONSUMPTION ACCORDING TO PURPOSE
(WITHOUT THE CHEMICAL FACTORIES IN ASWAN) IN 1958, 1962
AND ESTIMATE FOR 1964.

Purpose	1958		1962		1964		Average annual increase in consumption 1958-64
	Million KWh	%	Million KWh	%	Million KWh	%	
Industries	1092	62%	1750	66%	2610	70%	
Residential, public utilities & public lighting	468	26%	636	24%	900	24%	15.6%
Irrigation & Drainage	120	7%	160	6%	150	4%	
Traction	85	5%	104	4%	75	2%	

It is shown in the table and figure 7 that industrial consumers consume most of the electricity produced in recent years. The table shows also that while industrial consumption is increasing at a high rate of growth, other classes show a clear absolute and relative

decrease in their consumption. This is a result of new industrial developments in the country consuming more than two-thirds of electricity generated.

In the comparison between the rate of consumption of the main classes between Britain and Egypt, it could be noticed from the analysis above that, while industrial consumers in Britain in 1964 show a percentage of 43.7%, in Egypt they are estimated to share about 70% of the total consumption. In contrast with this, commercial, domestic, and public lighting in 1964 consume in Britain a high percentage of 53.0% whereas in Egypt they are estimated to share 24%. This is due to the wide differences in the standard of living which influence the consumption of these classes, as explained above. Traction in both countries consumes a small percentage of the total.

It could be also noticed that the average annual rate of increase of consumption of all categories between 1958 - 1964 is higher in Egypt than in Britain. The rate in Egypt is approximately 15.6% while in Britain it is 10.9%.

Industrial consumption.

Electricity as a fuel in industry has been used as early as 1904 in the Iron and Steel industry in

Britain. In recent years the improvement of technologies, automation and new methods of operation - the main factors for higher productivity depend on electricity supply.

In Britain, industrial consumption of electricity has increased by a rate slightly less than $7\frac{1}{2}\%$ annually over the decade 1952-62, while the increase in the index of production was slightly more than 3%. On the basis of the 4% growth, an increase in industrial production by 6.8% as estimated by N.E.D.C., requires the electricity supply industry to plan for a 9% growth of industrial electricity consumption.(11) This means that supply has to be more than doubled in ten years. The increase in industrial consumption arises from the expansion of modern industries using relatively large amounts of electricity. The largest industrial consumers of electricity in Britain are the chemical and allied trades, iron and steel, engineering and electrical goods and coal mining. They consume nearly half of the total electricity sold to industry. Table 7 shows the total sales in 1963/64 to the main industrial groupings in Britain. In addition to the

(11) Edwards, R., The Electricity supply industry. The present position and aims for the future Electricity Council 1964 p.6

larger industries mentioned, the table shows a notably higher percentage of use of electricity in vehicle and textile industries.

TABLE 7.

GROUPING OF INDUSTRIAL CONSUMPTION IN BRITAIN
1963 - 64.

Industry group	Share of industrial sales 1963-64 %
Gas water etc.	4.1
Coal mining.	9.0
Other mining & quarrying, bricks, pottery, glass cement etc.	5.8
Iron & Steel.	14.7
Non-ferrous metal.	2.6
Chemicals & allied trades.	15.2
Shipbuilding & marine engineering.	1.5
Engineering etc.	10.0
Vehicles.	6.0
Miscellaneous metal industries.	4.8
Textiles, leather & clothing.	6.8
Food, drink & tobacco.	5.6
Paper printing & publishing.	3.4
Construction.	0.6
Other industries.	8.4
Total	100.0

Chemical industries are the largest consumers of electricity, and are expecting to use more electricity in the future. A significant feature of this expansion is the growing dependence on such things as plastics and manmade fibres, which require large amounts of power to produce the equivalent of traditional material. The expected increase in demand of iron and steel industry will come from the replacement of traditional furnaces with electric furnaces. It is claimed that the difference between the cost of electricity and other forms of fuel, in the steel industry, has been so reduced that production of the common varieties of steel using electric furnaces has become a commercial reality.(12)

In Egypt the industrial sector has, as mentioned above, absorbed the major part of electricity produced. Most of the electricity used in manufacturing in Egypt is produced by the industrial plants for their own consumption. As in Britain the largest consumers of electricity in Egyptian industries are the fertilizer and steel industries. The Kima fertilizer factory at Aswan consumes most of the generated energy from the

(12) King Robertson. The supply industry's perspectives, The next five years, Electricity Council, 1962 p.53

hydro-electric power station at Aswan. (The factory is still not working at full capacity.) Other industries are also increasing their demand for electricity, especially those located in Cairo and Alexandria. According to the available data the whole industrial consumption in Egypt has increased as shown in Table 8.

TABLE 8.

INDUSTRIAL CONSUMPTION IN EGYPT.
MILLION KWh.

Year	1950	1953	1954	1955	1958	1962	1964
MKWh	540.0	720.6	790.6	896.8	1092	1750	2610

Figures 1950, 53, 54 and 55 published in United Nations Economic Development in the Middle East 1958. Figures of 1958, 1962 and 1964 are shown in Table 6.

The remarkable increase in industrial consumption in Egypt compared with other categories, is due to comprehensive industrial schemes and the fact that the average charges for industry are much lower than in most of the countries.(13)

(13) See p. 280

Commercial consumption.

Commercial consumption arises from a diverse group comprising shops, hotels, offices, hospitals, public buildings etc. The increase of demand of this class is due to the rising standard of living, of Government expenditure and the advancement of technologies in electrical appliances.

In Britain, during the 1950s there has been considerable improvement of commercial premises and their internal conditions and it is still growing. An example of government expenditure is the Shops and Railways Premises Act 1963, by which it is estimated that about one million premises accomodating about eight million employees will have its particular effect on the increase of commercial demand. It is required by this Act that lighting, heating, hot water supply and clothes drying facilities shall be provided. Also, and most effective on commercial consumption is the air conditioning which is installed in most public premises such as Universities, office blocks and the like. Examples of the technological advancement and its effect on commercial consumption are: the development of the fluorescent lamp which lead to an increase in lighting load, the development of the block

storage heater specifically designed to operate in off-peak periods which are at present rapidly increasing in numbers used in commercial premises, floor warming devices etc.

The effect of these factors, in the last five years, resulted in an increase of commercial sales by 10.3% and is expected to increase by 10.5% per annum until 1966, the period investigated by the N.E.D.C. In Egypt, separate figures for this category are not available, but on the whole it is expected that commercial consumption especially that which is influenced by Government expenditure will be growing.

Agricultural consumption.

The use of electric power in farms in the western countries is on a large scale which it may not be possible to reach in underdeveloped countries in the near future. Plans for using electricity on farms must be, in underdeveloped countries, drawn on a large scale to achieve a comparable standard with the western countries.

In Britain an average of more than 85% of farms have been connected with electricity. Electricity has been used for farm machinery such as hammer mills, mixers and pelleting machines for preparing foodstuffs

for livestock. Electricity supply has become a necessity in modern farms for harvesting, water heating, steam sterilisation, milk cooling and for the rearing of pigs, poultry and cattle.

In Egypt, planning to provide electricity for agricultural uses is of great importance. Egypt embraces a vast area of land which can be cultivated, if there is enough water. For example, in Upper Egypt where the level of land does not permit a continuous free flow for canals, electrically-driven pumping sets, large and small, can bring a copious supply of water to the surface, improving the yield of the land and bringing larger areas under irrigation. In Lower Egypt, where some of the land is salty, drainage will make it fertile. Electric pumping stations for drainage schemes can widen the cultivated area in Lower Egypt.

The benefits to be gained from the extra cultivatable area cannot be over-estimated: not only will it provide work for the unemployed, but it would also practically fulfill the country's economic requirements. Irrigation and drainage, provided by cheap electricity supplies, will help towards a further expansion in the desert on a long-term policy. For

instance, it can be extended to cover the shores of the Mediterranean as far as the western boundaries of Egypt. This region has suitable climatic and geographical conditions for habitation and seaside recreation as well as industrial and commercial activities.

Apart from the use of electricity in irrigation and drainage schemes, it can be used in the processing of agricultural products, which traditionally are made by other motive-power machines. A few of these processes are rice-hulling and polishing, cotton grining flour-milling, oil-extraction and timber-sawing. The flexibility and economy afforded by electricity is leading to its replacing other forms of motive power. The rural population in Egypt who live on agriculture are not busy all the year. Thus if improved methods of agriculture are introduced, other occupations will have to be found for a large number of cultivators who may become surplus manpower. In this case a rapid expansion of cottage industries must be created. Among these industries which can be established with the help of electricity are weaving on individual power looms, machine-knitting, button making, wooden toy making etc.

There have been intensive studies for the application of electricity to various types of farm work. Electricity supplies can aid, in some way or another, in the growing, processing and distribution of farm products. Some of the farm-work in which electricity can be used are: grain-drying where artificial grain-drying equipment is necessary to be used in bad weather conditions, grass-drying which secures high protein feed for livestock, if it is done rapidly by electric machines. The installation of adequate lighting in farm houses and other buildings will at least eliminate fire hazards due to the use of oil lanterns. Heating for water and steam are required for sterilization purposes. There are also many processes in farming in which electricity can be used, such as dairy farming, feed-processing, poultry farming, fruit-growing etc.

The main problem in bringing electricity to the farmers is the high cost of connecting them to the mains. But the solution in Britain is that if farmers can make full and varied use of electricity, they will get a return on their capital investment and at the same time this will help the Electricity Boards to get proper return on their capital investment.

The problem in Egypt may be more complicated, because of the lack of the grid system which is required for a rural electrification scheme and because of the scarcity of capital for all uses mentioned above.

Though it can be seen from Tables 5 and 6 above, that the percentage of agricultural consumption in Egypt is higher than in Britain but, in fact, this is not satisfactory, especially when, as shown in Table 6, that this percentage in Egypt is decreasing. The fact that Egypt depends on a great part of its economy on agriculture is a primary reason for the Government to encourage by all means the consumption of electricity of this category.

Domestic consumption.

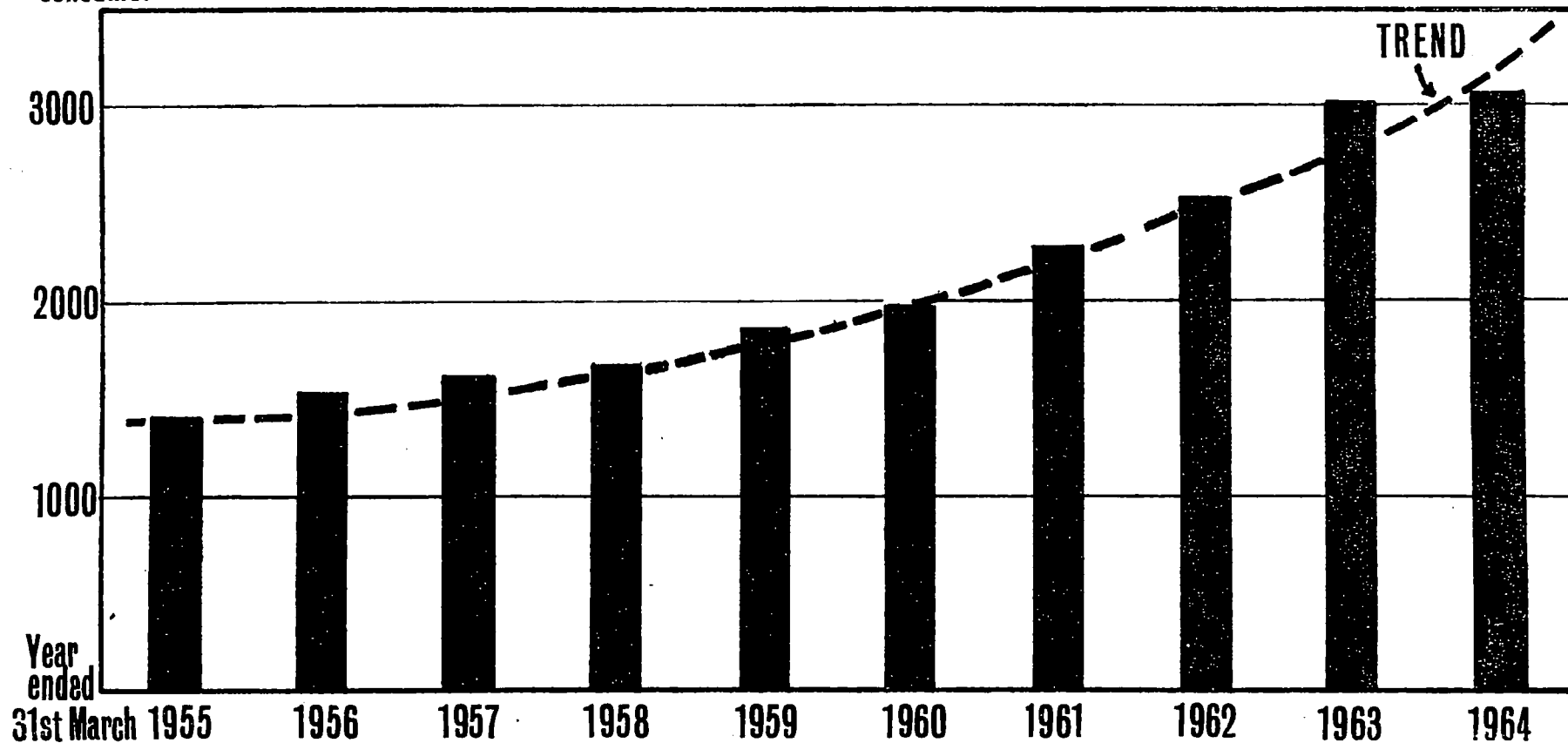
In domestic life the increase in numbers of domestic consumers and their average consumption represents a large part in the total of all classes in Britain.(14) Figure 8 shows the average sales of electricity per domestic consumer, which amounts to an average rate of increase of 9% per annum from 1954/55 to 1963/64. In the last five years the average increase of domestic consumption was 12.8%.

(14) See Table 5 p. 168

Fig. 8. DOMESTIC SALES OF ELECTRICITY — AVERAGE SALES PER CONSUMER

Average rate of increase 1954-55 to 1963-64 in Britain
9 Per Cent Per Annum

Units per
consumer



This substantial increase is due to the rising standard of living and the growing range of power-driven facilities at home. In Britain, in 1964, electric cookers were used by 32% of households, double the proportion just after the war. Consumers using refrigerators have risen from 2% to 33%, washing machines from 2% to 50% and water heaters from 10% to 42%, over the same period.(16) In addition to the growth of use of electrical equipment at home, domestic demand is expected to increase in Britain for reasons which a planner may take into consideration. Some of these are, the development of space and storage methods of heating supplied on off-peak tariffs, the establishment of smokeless zones under the Clean Air Act and the continued increase in the number of married women at work indicating a greater need for labour-saving electrical appliances in the home, according to the N.E.D.C. predictions.(17) In Egypt it is difficult to assess comparable figures in the domestic field because figures show no differentiation between domestic and commercial consumption. But generally speaking, it

(16) Edwards, R. Address given at the Annual Conference of the Electrical Development Association at Harrogate 18th Feb. 1964 Electricity Council publication p.9

(17) Marsh, N.F. Financial Times Annual Review of British Industry July 6th, 1964.

is expected with the rising standard of living and the production of electrical equipment such as cookers, heaters and especially refrigerators, domestic consumption will be increased in the near future.

Consumption Estimates.

The analysis above shows the actual consumption and the expected increase in demand by various classes of consumers. This indicates the necessity for planning for the construction of electricity supply projects to meet this demand. Planning for the installation of power plants is based on the forecasting of the growth of demand. The accuracy of these estimates are essential to ensure that -

- (1) sufficient plants are installed to meet the demand required and
- (2) not too much plant is on load as this will cause additional and unnecessary losses. (18)

From the British experience, these estimates are made from three sources, Area Boards, the Electricity Council and the Generating Board.

Area Boards' Estimates.

For short-term planning there is no difficulty in predicting the demand, peak and off-peak periods

(18) Rulsford, H.C. Second Conference of University Professors on problems in the Electricity supply industry Electricity Council, London 1962 p.18

are known. Sources of forecasts of the Meteorological Office for different times of the day are available. For example, light consumption can be estimated according to the hours of darkness, although it may be influenced by clouds covering visibility. Space heating demand varies according to the air temperature of the day during 24 hours, humidity and wind speed.(19)

In middle-term planning for the load growth, Area Boards have to consider both the demands of new business and the increasing demand of the existing consumers. Estimation of this load growth can be made by a constant day-to-day contact between the staff of Area Boards and Districts and their consumers. They can get sufficient information about the development in the number of properties which depends on the rate of building and the rate of increasing population. For example it would be known if the local Council was hoping to build a new housing estate and other builders were to produce more houses for sale. The staff can also get the necessary information about industrial consumption and the growth arising from the establishing of new factories or the extension of existing ones. They can also follow similar methods

(19) Ibid p.18

for the estimation of other fields of consumption. The rate of population can be made available by the Registrar General who will provide the necessary figures. Estimation of long-term demand, introducing long-term planning for schemes such as new bulk supply points, may also be done by Area Boards Headquarters, but these schemes will be discussed with the Generating Board and are decided upon according to any longer-term proposals for industrial growth and housing development in the area. The whole forecast for any of these periods of time must take into consideration the statistics of the past sales of electricity to give at least an indication of the rate of increase in demand for expected similar conditions. The main difficulty in estimation of demand by Area Boards is the degree of certainty while in short-term forecasting, for six months or one year, prediction may be precise, a period of two or three years there is a less degree of certainty. Long-term forecasting estimation is quite difficult because changes in industrial, commercial and domestic demand could fluctuate substantially in this period. In an attempt to reduce this difficulty, the Electricity Council are trying to improve sources of information on regional development

particularly in connection with industrial supplies.

The combination of estimates by individual Area Boards needs further assumptions, because 'the unit consumption forecasts can be aggregated but not the maximum demands. Diversity of incidence of demand between areas as well as estimated transmission losses have to be forecast so as to give the equivalent national simultaneous demand on generating plant.' (20) Electricity Council Estimates.

The second estimate is made by the commercial department of the Electricity Council. The commercial department makes a national estimate after consultation with the Generating Board, the Ministry of Power, the Treasury and industrial users about their future plans. The Electricity Council takes into account not only the ten-year trend, but also four main considerations:

- (a) The gross domestic product and its sub-division into industrial and other sectors.
- (b) Industrial production and its sub-division into main industrial groups.
- (c) Commercial activity and its sub-division into shops, offices etc. and

(20) Edwards, R., & Clark, D. Planning for expansion in electricity supply, Electricity Council p.4

(d) Growth in population households, saturation factors of the main electrical domestic appliances and annual consumption per appliance.(21) The object of the estimate is to check the Area Board's forecasts and to see whether they are reasonable in light of national economic and social development and if any divergence from past rates of growth is likely.

The Generating Board's Estimate.

The third estimate is made by the Planning Department of the Central Electricity Generating Board. The Board makes a national forecast based on the mathematical analysis of the national trend of consumption over the preceeding ten years. The use of the trend method is based on the assumption that electricity has been fairly steadily increasing over the last 40 years. The board chose the ten-year period after examining the trends over various periods and decided that a ten-year trend was the most satisfactory to use in six, seven or eight years forecast ahead. Besides the Board takes into account, in an annual review, any sign of tapering off according to the fluctuations of weather conditions in the year.

(21) Ibid. p.4.

The adopted estimate.

The Technical Planning Committee of the Electricity Council consider the three estimates before the full Council take the decisions on plant programmes and financial estimates. The Committee adopt reasonable forecasts taking into account the background of each forecast, even the personality of the forecaster.

The question now is what is the adopted forecast?, what is the margin of error?

In fact, there is difficulty in making an accurate forecast of electricity consumption. Forecasting the demand for electricity six years ahead is forecasting the decisions of about 16 million consumers in the future, many of whom have not yet considered the purchase of the appliances whose use will create a demand. However, a good degree of accuracy can be achieved by the improvement of market survey and forecasting methods. In recent years the Electricity Council has adopted demand estimates slightly below the ten-year trend estimated by the Generating Board. In 1959 the Electricity Council adopted a forecast equivalent to 6.5%, while the ten-year trend was 6.9%, in 1960 the trend figure

was 7% and the figure adopted was 6.6%. The reasons for adopting figures below the trend line, stated by Professor Edwards are; first, the chronic capital stringency existing for many years. Planning had to be on the basis of what was the minimum which the industry could get by. Secondly, engineers were steadily improving the effective supply of plant by improving the availability each winter. And lastly, the forecasters were always bearing in mind the fact that a doubling every ten years could not continue indefinitely and they therefore tended to slow up the growth rate in the following years of the forecasts.(22)

In 1961 the Electricity Council adopted the estimated trend figure of 7.2%, but in 1962 they adopted a figure of 7.9% which was above the trend figure of 7.6%. This has resulted in an estimated increase in the simultaneous maximum demand expected in the following years to 1967/68 as shown in Table 9.(23)

(22) Edwards, R., & Clark, D. Op.Cit. p.61.

(23) Marsh, N.E. Looking to the future Electricity Council Spring school 63 p.2

Fig. 9.

Estimated Maximum Demand in Average Cold Spell Weather in Britain

Megawatts

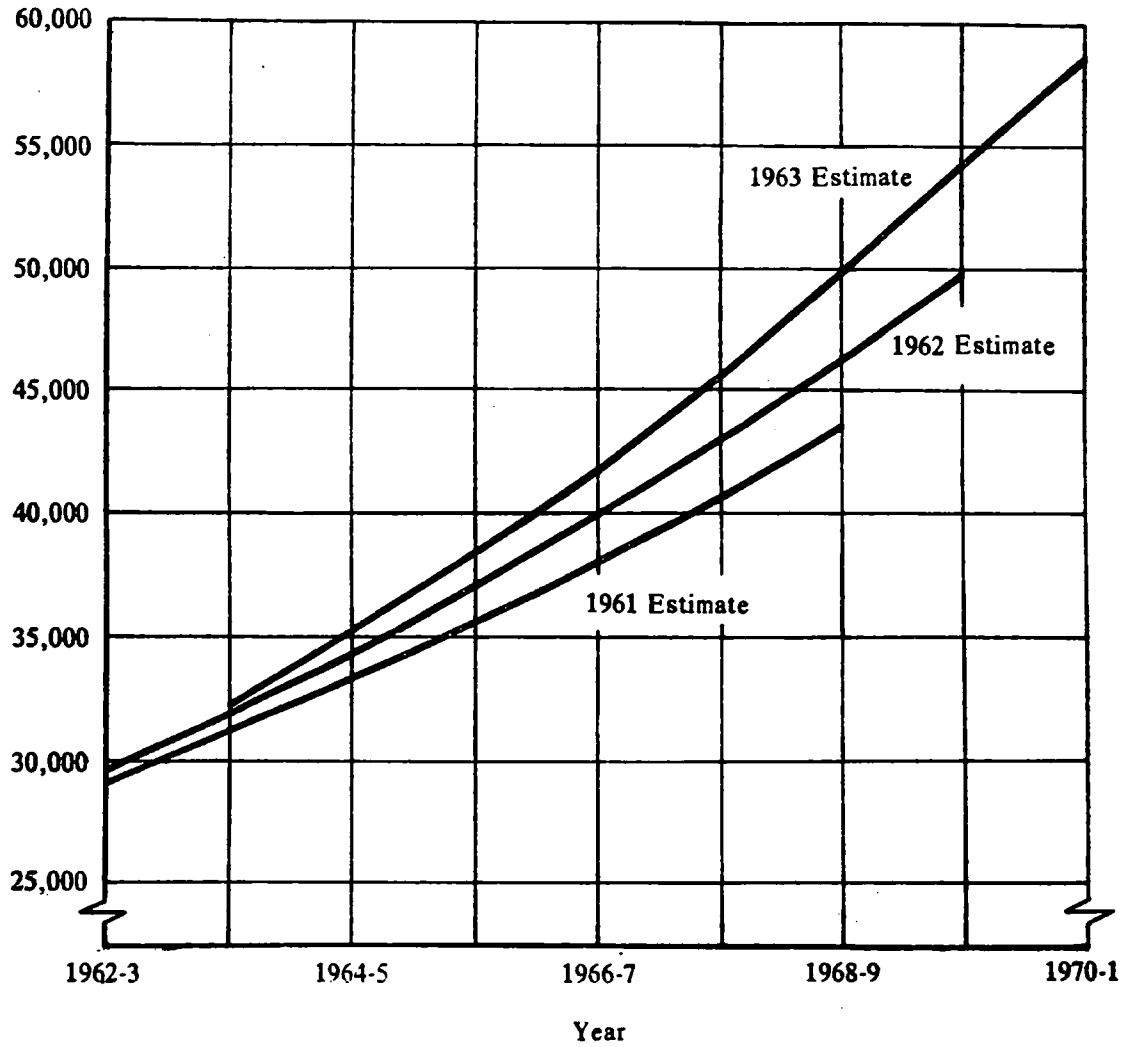


TABLE 9.

SIMULTANEOUS MAXIMUM DEMAND GENERATING BOARDS
SYSTEM IN AVERAGE COLD SPELL CONDITIONS (MW).

	<u>1962/3</u>	<u>63/64</u>	<u>64/65</u>	<u>65/66</u>	<u>66/67</u>	<u>67/68</u>
Estimate made in 1961	29000	31000	33200	35500	38000	40700
Estimate made in 1962	29600	31900	34350	37000	39900	43000

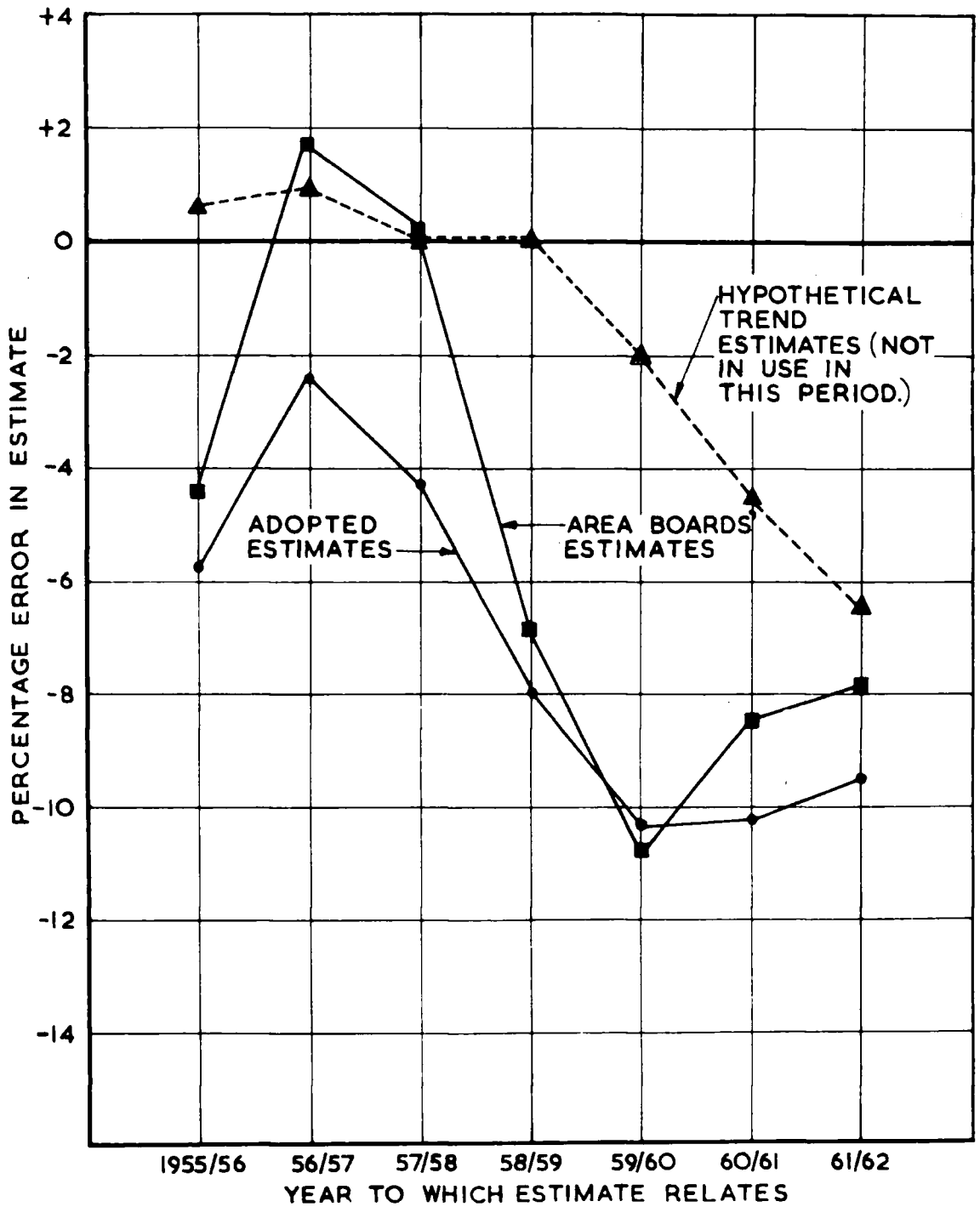
In 1963, the Electricity Council considered a forecast submitted by the C.E.G.B. based on a trend 7.9% growth per annum in maximum demand, the Area Boards' estimates and the N.E.D.C. objective of a national growth rate of 4% per annum. The estimates adopted were somewhat higher than those proposed by the C.E.G.B.(24) The three estimates of 1961, 62, and 63 are shown in figure 9, which demonstrates higher adopted estimates in 1962 and 1963.

The above discussion shows that there is a margin of error occurring in applying the ten year period trend method.(25) The sharp increasing demand in the winter of 1962/63 illustrate this. While in 1956 forecasts were made on an average compound rate

(24) C.E.G.B. Annual Report 1962/63 para 226

(25) Edwards, R., & Clark, D. Planning for expansion in electricity supply p.61

Fig. 10. Percentage Error in Forecasts of Demand
for the Sixth Winter Ahead in Britain



of growth of domestic consumption over the previous four years of 5.4% between the years 1959/60 and 1962/63 the rate of growth had increased to 17.4%.(26) It is clear from Table 5 that the percentage of increase in various categories in the year 1962/63 over the previous year was much higher than any other year. Changes in weather and patterns of consumption are factors which affect the trend method. However, as shown in figure 10, the ten-year trend method gave increasingly worse forecasts for the three years up to 1961/62. The remedy for the defect needs more intensive study of the concentration of markets as well as economic research on factors affecting the estimation of demand, for instance, the relationship between demand and price in the various markets for electricity.(27)

Electricity supply projects.

Having arrived at a forecast of demand, the next step is to decide the establishment of the necessary projects which should be planned to supply over and

(26) Melling, C.T. Long-term planning in electricity supply, 1963 p.9 (Electricity Council publication)

(27) Edwards, R., & Clark, D. Op.Cit. p.62

above the estimated demand. The projects of the electricity supply industry include the construction of new power stations, hydro-thermal or nuclear, and the establishment of grid or supergrid systems by interconnecting all power stations in the country which will result in a highly integrated system of generation and transmission. With the grid system any power plant can be used to supply electricity to any locality no matter how remote.

In Egypt, projection of power stations and the grid system have been decided in the first five-year plan 1960-65. The main scheme of this plan is based on generating electrical energy in large, interconnected, high efficiency thermal power stations situated at appropriate locations with respect to availability of cooling water, fuel facilities and proximity to load centres. The use of diesel-electrical stations is limited to regions of limited electricity consumption, far from the existing and planned distribution networks. Map I shows the expansion of major electricity power stations in lower Egypt according to the five-year plan 1960-65. The Map shows that some ~~seas~~ areas such as Suez, industrial area in the Delta and Alexandria, a greater expansion in the size of power station takes place and

face new industrial schemes located in these cities. In Cairo and its suburbs which are already heavily located it could be seen from the Map that there is little expansion in the size of power stations. The scheme also includes the erection of a 220 KV inter-connection and transmission network in Lower Egypt (Map 2), and 132 KV system for the utilisation of the Aswan Dam Hydro-electric energy in Aswan and Quena Governates (Map 3), as well as the erection of 66 KV, 33 KV, and 11 KV distribution networks for the feeding of the new industries, irrigation and drainage pumping station, water works and public utility projects and for the electrification of municipalities and villages.

In addition to the five-year plan a provision plan for the establishment of high-voltage networks have to be ready in 1967 to transmit and distribute the electrical energy generated from the first High-Dam units which are expected to be commissioned at the end of 1967. Transformer substations are included in this plan to supply the load centres in Upper and Lower Egypt as shown in (Map 4).

A long-term plan ending in 1985 has also been drawn up including the available resources of power

supply until this date, as shown in Figure 11.**

The most interesting feature of these plans is the attempt to exploit the hydro sources of the country from dams and reservoirs sited and planned to be established on the River Nile. The priority given to hydro-electric power arises from the fact that the country's fuel resources, during the five-year plan, could scarcely meet 68% of its needs.(28) Moreover, cheap electricity supply has become a necessity in Egypt, for economic and social development, which requires a constant increase in production through the use of modern machinery. The provision of hydro cheap energy, no doubt, will stimulate the establishment of new industries and consequently the hope of raising the standard of living. Sweden, Switzerland and Italy

** Footnote. According to Figure 11 it is expected that nuclear power generation will be operated in 1967 instead of being commissioned in the first five-year plan as mentioned. There is no indication why changes in the plan has been made, but probably this is due to the difficulties attached to nuclear generation discussed in page

(28) Industry after the revaluation and the five-year plan Egyptian Min. of Industry July, 1957
Cairo p.2

M.W.
3000

FIG. 11

DEVELOPMENT OF ELECTRICAL ENERGY GENERATION
REQUIREMENTS IN THE U. A. R.
(1952 - 1985)

2500

2000

1500

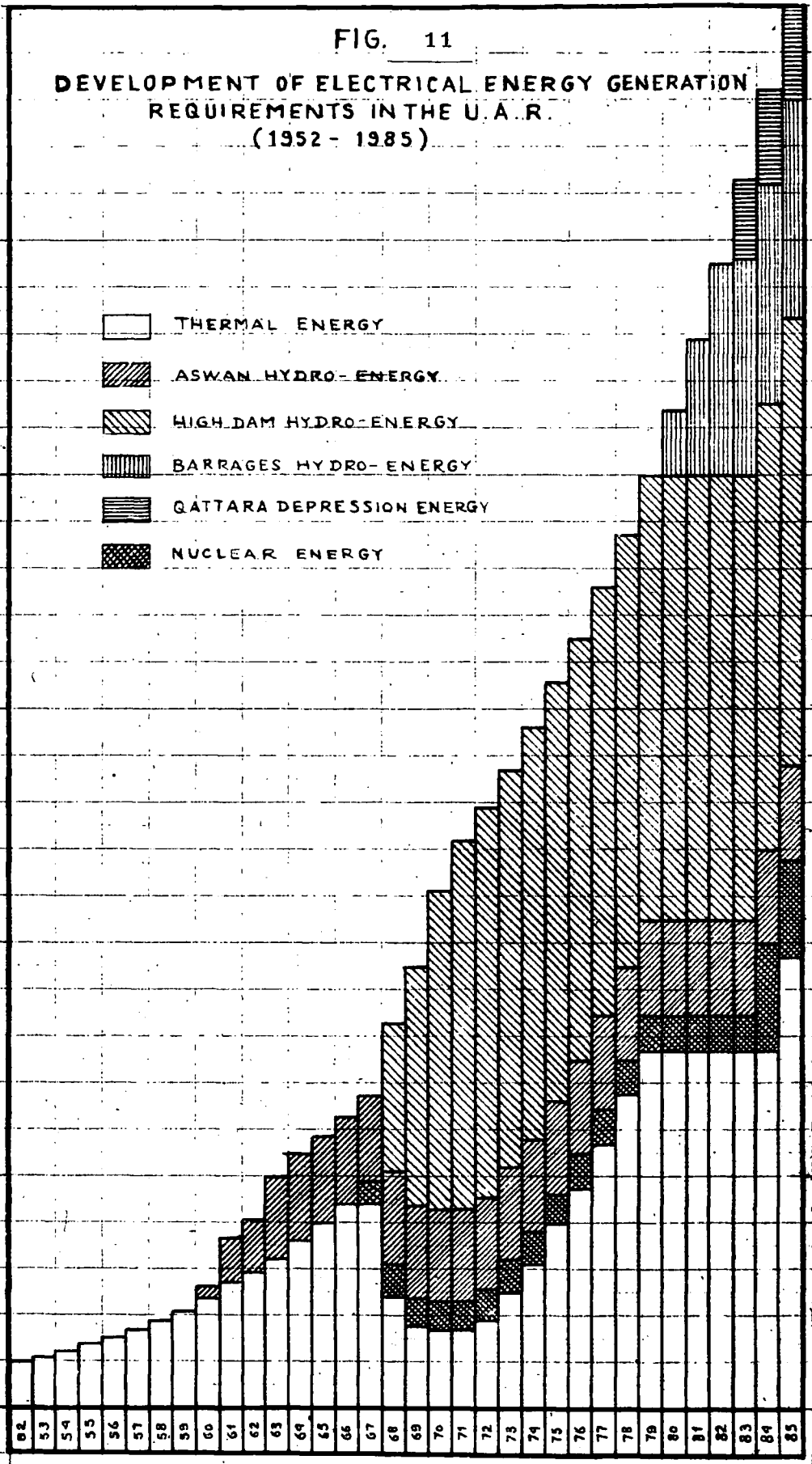
1000

500

0

- THERMAL ENERGY
- ▨ ASWAN HYDRO-ENERGY
- ▧ HIGH DAM HYDRO-ENERGY
- ▩ BARRAGES HYDRO-ENERGY
- ▨ QATTARA DEPRESSION ENERGY
- ▣ NUCLEAR ENERGY

82 83 84 85



provide examples of this.

At present the electricity supply system in Egypt contains three hydro-electric power stations. They generate nearly one quarter of the total generated energy in the whole country as shown in Table 10.

TABLE 10.

CLASSIFICATION OF ELECTRICAL POWER STATIONS IN THE U.A.R. ACCORDING TO TYPE OF PRIME MOVER 1961.

Type of prime mover	Installed capacity		Generated energy	
	MW	%	MKW h	%
Steam turbines	755.7	57.8%	2352.3	65.9%
Diesel engine	182.8	14.0%	246.5	1.5%
Gas engines	19.0	1.4%	11.6	0.3%
Hydraulic turbines	351.0	26.8%	1012.0	27.3%
Total	1308.5	100%	3622.4	100%

The largest and most important of these stations is the Aswan Dam. Most of the power generated from the Aswan Hydro-electric project is used by the Kim Fertilizer Company. The rest is supplied to the irrigation scheme in the area, iron mines and other industries of sugar cane, conservation of date etc. The planned hydro-electric projects are the High Dam hydro-electric power station, the Nile Barrages and

the Quattara Depression hydro-electric power projects.

The High Dam project will start its operation in 1967. By 1970 the full installed capacity will be reached and the total annual generated energy will reach its full capacity in 1980 with a maximum 9500 MKWh per annum, as shown in Table 11.

TABLE 11.

ESTIMATED GENERATED ENERGY FROM THE
HIGH DAM POWER STATION.

<u>Year</u>	<u>Installed capacity MW</u>	<u>Available energy per annum MKWh</u>
1967	525	
1968	1050	3140
1969	1575	6100
1970	2100	7400
1971	2100	7800
1972	2100	8200
1973	2100	8500
1974	2100	8700
1975	2100	8900
1976	2100	9000
1977	2100	9100
1978	2100	9200
1979	2100	9500
1980	2100	9500

The economics of this project can be briefly summed up as it would provide a cheap energy for the newly created electro-chemical and electro-thermal industries.

In agriculture the project will provide electricity for machinery, for irrigation and drainage pumps, which ultimately will have at least three economic results.

- (1) The cutting down of production costs and allowing higher volumes than present techniques.
- (2) By replacing animal power by electrical machinery will permit a major part of the land used for cultivation of animal food to be converted to production for human use.
- (3) Electrical machinery will release dairy animals from the present necessity to perform farm work and thus raise their meat and milk production. This means that the substitution of conventional feeding stuff out of harvest by other scientific food would result in saving of land and energy of animals.

The rest of the energy generated from the project will be transmitted by means of 500 KV extra high voltage transmission lines to the consumption centres in Upper and Lower Egypt.

After the construction of the High Dam, a long range plan is formulated for the electrification of the Nile Barrages estimated to supply an annual energy

production of about 4700 MKWh, foreseen in 1980. Also the Quattara Depression power station planned to be constructed in 1985 is estimated of 1500 MW capacity.

Conclusion.

To sum up, it has been explained in this section that the general aims of economic planning in any country are to raise the standard of living, and planning in the electricity supply industry aims at raising the level of consumption per capita as a measure of the standard of living. To achieve these aims, it is essential to take into account the following considerations.

The participation of the Government in formulating economic plans is essential, especially in a developing country such as Egypt, whenever the private sector fails in carrying out an effective role in the balanced development of the country. One of the main industries in Egypt which needs a Government comprehensive planning programme is the electricity supply industry.

Comparison between Britain and Egypt shows that production and general consumption in Britain are much higher than in Egypt. In the periods examined 1958-64 the average annual rate of increase in general consumption is higher in Egypt than in Britain. Consumption per capita is lower in Egypt than in Britain. The average rate of increase in consumption

per capita in Egypt is slightly lower than in Britain, i.e. it is reasonable in a developing country, but this average is distorted by the heavy consumption of the industrial sector. As mentioned, compared with Britain the industrial category in Egypt consumes a greater proportion of the whole production. Though in Britain the industrial category consumes the largest proportion, this proportion is lower than in Egypt. It is essential that agricultural consumption in Egypt should be increased more than at the present rate. Commercial and domestic consumption in Egypt also represents a low proportion compared with Britain. The lower standard of living is the main factor in this respect.

However, the actual consumption of these categories must be known as a basis for future estimation of demands, although it is not always a reliable method. It is found from the British experience that the trend method is not always correct. The use of the actual data in forecasting of demands should be reviewed periodically combined with more studies of the markets. Once estimates have been made the necessary projects to meet these demands have to be planned. Examples of these plans were given about the Egyptian electricity supply industry with their economic expectations.

MANPOWER PLANNING.

The aim of manpower planning is to ensure that the required number of workers with the required qualifications are available. At any time it is the duty of planners to budget for manpower requirements and to ensure that they can be met, as in planning to meet financial requirements discussed in the following section.

An investigation of manpower problems should lead to policies for

- (a) Securing the size and qualifications of manpower required for various activities contemplated under the plan and
- (b) An effective contribution to absorbing excess workers by increasing the number of available jobs in the enterprise concerned. Both policies are more difficult to carry out successfully in Egypt than in Britain, because the first of these policies mainly involves finding technical and other personnel for different activities. In Egypt, as in most of the less developed world, there is a large surplus of unskilled manpower which coincides with considerable shortage of workers of the skilled and the highly skilled

grades. The second policy is associated with problems of under-employment and unemployment which are of a higher order in Egypt than in Britain.

To assess the necessary data to be considered in carrying out these policies, some questions arise: what is the proper size of manpower in the industry concerned, and what are the factors determining the increasing or decreasing numbers of workers, and finally the education and training schemes which are adopted or suggested to improve the productivity of manpower. These problems will be examined within the public sector in Britain. Also a comparison with Egyptian public enterprises, with special reference to the electricity supply industry, will be made.

Size of manpower.

To secure the required size of manpower, each public enterprise should have a manpower committee which investigates the existing size and qualifications of workers and staff and forecasts the manpower requirements over the period under planning. To make an assessment of these requirements, planners must have at their disposal a knowledge of past employment trends in the industry concerned, provided with

statistics showing the facts of the past years. Also a knowledge of any existing shortage of technical manpower is necessary. This information will be useful in forecasting. The knowledge of the existing shortage of technicians would indicate the probable effect of technical progress on the level of employment in the enterprise. Statistical data about the kind of skill required and the probable supply of this kind of manpower are also of major importance.

Before giving information about the current and future trends in employment, it is necessary to know the magnitude of men and women of working age. In fact, the range of working age depends on the educational system of the country. Therefore factors have to be considered, such as the continuation of further education at higher schools, universities and other educational institutions. This group have not yet begun their working life. In addition, the will to retire at a certain age, has to be taken into account, or people who do not want to work, or married and unmarried women of working age who stay at home. The balance are those who are able and willing to seek employment.

Returning to the employment trend, in Britain, the N.E.D.C. reported in 1963 that there will be a steady increase in the labour force in the whole economy and that there will be an annual increase until 1966 of about 0.7%, but in 1964 they estimated that this increase would be slightly larger at an annual rate of 0.8%. In the British nationalised industries the employment trends fluctuate. While there is a decrease in numbers employed in the coal and gas industries, there is a slight increase in the electricity supply industry. The main reason for the tendency for decrease in numbers employed is technical improvements. In the coal industry the average number employed, in 1961, was 570,000 and at the end of 1962 536,000. The N.E.D.C. considering the 4% growth, think that the labour force in the coal industry will not exceed 500,000 in 1966.(29) Similarly in the gas industry improvements in technology account for the decline in its labour force. The following table shows this decline and the prediction of the numbers employed in 1966 based on the 4% growth of gross national production estimated by N.E.D.C.

(29) Report March 1963 para 49 - 50

TABLE 12.
THE GAS INDUSTRY TOTAL EMPLOYMENT
(THOUSANDS)

	1956	1961	1966 ^{4%}
Production	58	45	38
Distribution	16	16	15
Consumers services and others	64	65	64
Total	138	126	117

The technological progress can be clearly seen from the remarkable decrease in numbers employed in the production processes in which technical improvements have a greater effect in reducing the number employed. On the other hand consumer services show that there was more employment required between 1956 and 1961. This is probably because employment in this process is not greatly affected by technical progress. On the whole the tendency of employment in the gas industry is to decrease, as the latest figure shows that the number employed in mid-September 1964 is 122.0 thousand.(30)

Planning for manpower requirements should be reviewed annually to take into account all possible changes derived from the recent enquiry and to reduce as much as possible the error in estimation of the

(30) Ministry of Labour Gazette Vol. LXXXII No.11

proper size of employment. This has been made by the N.E.D.C. in revising the manpower estimates in 1964, and gives different results from those which had been published in 1963. The following table shows a downward revision of earlier (1963) forecasts of manpower requirements for 1966 in coal mining.

TABLE 13.

THE GROWTH IN EMPLOYMENT 1961 - 1966.

	1961 mid-year Thousands	1966 mid-year Thousands	<u>Changes 1961 to 1966</u> Thousands % per annum	
Coal mining	665	540	-125	-4.1 (-2.7)
Gas	127	123	-4	-0.7 (-1.2)

(Estimates in brackets published in 1963 by N.E.D.C.
(Growth to 1966))

The reason given for these new estimates, is the expectation of productivity to proceed at a faster rate than was assumed and this will enable the achievement of the output expected in 1966 with a smaller labour force.

On the other hand, the manpower decline in the gas industry shows an upward revision according to the last inquiry. The reason is that according to the improvement of output expected which involves a

continuing increase in sales of domestic gas heating appliances, the gas industry would need more manpower than was expected in 1963 Report.

In contrast with the two examples of the coal and gas industries, the current and the forecast of manpower requirement in the electricity supply industry shows an increasing trend. In the last five years ending in March, 1964 the average annual increase in numbers employed in the industry is 2.4%.⁽³¹⁾ The estimated annual increase till 1966 will be 3.1% based on the N.E.D.C. inquiry published in 1964.⁽³²⁾

This significant difference with other nationalised industries in Britain proves that technical progress in the industry concerned does not necessarily coincide with decreasing employment requirements, because the electricity supply industry in Britain is technically improving.

The question which may arise here is why employment in this industry is increasing. The reasons are:

- (1) to take advantage of recruitment of more manual workers from the flow of school leavers.

(31) Electricity Council, Annual Report and Accounts
1963-64

(32) Op.Cit. para 59.

- (2) additional employees are required on the generating and transmission side, for operating and maintaining new power stations both conventional and nuclear, and for maintaining and expanding of transmission networks.
- (3) perhaps the most important reason is the expansion of the distribution side of the industry, which is much less influenced by the technical progress. For example, the need for more employees to maintain the new installations of sub-stations and transmission lines. Also raising the standard of consumers' services due to the improvement of testing consumers' installations would lead to substantial increase in the number of inspectors required.
- (4) the remarkable expansion of the industry on both sides (generation and transmission and distribution) necessitate the increase in the technical engineering, research and development staff required.
- (5) Any temporary re-organisation of administrative processes in the industry, for instance, preparing for the transfer of the accounting process from dispersed to centralised points

involving the re-writing of records etc., require additional employees.(33)

To conclude, it is obvious that although technical progress and improvement in sales are universal factors between gas and electricity, increase in the size of manpower is shown in electricity and not in gas. This is because the electricity supply industry mentioned is expanding with a higher rate especially in the distribution side which needs more manpower and is not affected much by technical progress.

The problem of skilled manpower.

The discussion above shows that the size of manpower required is partly influenced by the technological progress in the industry and partly by other factors stated in the case of the electricity supply industry. To draw up a policy aiming to achieve the size required, a major consideration must be given to the problem of the shortage of skilled labour.

(33) Memorandum by the Electricity Council, manpower and productivity, Report of the Select Committee on Nationalised industries, May, 1963
Appendix p.250

In public enterprises, both in Britain and Egypt the expansion of using highly modernized machinery necessitates the appreciation of skilled labour requirements. For a balance between the future demand and supply of technical skills, a planner must acquire the statistical data showing the existing shortage of skills and an accurate estimate of the kinds of skills required within the period of planning. A classified list of the various occupations of the industry which need such skills and based on regional requirements may indicate the position of the demand factor. The supply factor may be known from the possible proportion of technical manpower graduated from universities, other technical institutions and the number who attend courses of training in the industry who will be recruited. But a balance of this kind is difficult to set up. Because it involves all the problems of manpower mobility, for instance, it is not easy to move workers with particular qualifications from one industry to another. Competition with the private sector in the demand for this rare commodity should be faced. It is true that skilled manpower is not a less rare commodity than capital and needs more

than the mechanisms of a free labour market to achieve the balance between skilled manpower supply and demand.

The problem of skilled manpower in public enterprises is more acute in Egypt than in Britain. As mentioned above in most of the less developed countries there is a large surplus of unskilled manpower co-inciding with considerable shortages of skilled and highly skilled grades of manpower. What makes the situation more difficult to solve is the fact that Egypt in carrying out the tremendous industrial schemes, through the public sector, can utilize the most advanced technology and machinery which industrialized countries have taken decades to develop.(34) Technical advances inevitably lead to an increase in the demand for the highly-skilled labour force with a simultaneous decrease in demand for unskilled labour which urgently needs to be absorbed.

The problems of mobility may be also more acute in Egyptian public enterprises than in Britain.

(34) Harbison, F.H., & Ibrahim, I.A. Some labour problems in Egypt, The Annals of the American Academy of Political and Social Science May, 1956 Vol. p.114

Because of the large number of newly established public enterprises, which for other economic factors must be located in areas with 'no inherited tradition of skill, no ready familiarity with mechanical appliances, no idea of standards of output or productivity and no appreciation of the exacting standards of mass production or even of occupational hazards.'(35)

In the electricity supply industry, perhaps, the problem is the serious shortage of highly-skilled scientific and technical personnel required in connection with the construction of nuclear power stations. In planning for manpower requirements to operate nuclear power stations three questions arise: the future demand of kinds of skill, how these skills can be supplied, and the factors which may affect the future supply of skilled manpower required. The operation of nuclear power stations requires scientific and technical qualifications such as those of physicists, chemists, engineers, technicians, mechanics, electronic workers, electricians and others.

(35) United Nations. Organisation and administration of public enterprises in the industrial field New York 1954 p.32

The supply of these qualifications may be drawn from three main sources; first, from the ordinary skilled labour in other industries such as mechanics and electricians, who need a comprehensive adult vocational training; second, from skilled workers who work in other atomic power organisations, as atomic research centres and similar industries using atomic energy; third, from young qualified workers who have recent theoretical training on industrial uses of atomic energy.

As regards the first category, the electricity supply industry is not likely to be successful in solving the problem of shortage of this particular skill by transferring the skilled labour from conventional to the atomic energy industry, (36) because these persons who are already employed in other industries have assumed a permanent character. The second category is difficult to approach because the demand for these skills arises at the time when other centres using atomic energy are short of these skills. Perhaps medical and military centres are strong competition in this field.

(36) United Nations Economic application of atomic energy; power generation and industrial and agricultural uses. New York 1957 p.89

The third sector is understandably the most available source for recruitment. The young people who have had some theoretical knowledge would be easily adaptable to work in nuclear power stations. Similar difficulties concerning the requirements for atomic skill will face the Egyptian electricity supply in future. Therefore proper planning for this kind of skill should be made in advance.

Education and training.

The overwhelming demand for skilled labour may make it essential to develop large-scale training programmes in order to safeguard manpower planning targets.

It is essential in public enterprises that the widest facilities should be given for the education and training of workers. Workers should not only know how to do the job but also should know why they do it and some of the economic and managerial problems of the industry concerned.

It is also essential that other categories of manpower such as foremen, instructors and management personnel should have adequate training facilities to further their knowledge. Training, either of manpower employed in the industry or of new entrants,

has a considerable effect on economic development. As technology advances, training and retraining, on an increasing scale, will promote the necessary shifts and adjustments. Bad programming of appropriate training schemes will result in faulty planning of production, faulty choice of materials, incorrect assignment of machines, inadequate maintenance of plant and equipment, and bad staff relations due to untrained works managers.

Training of foremen and senior managers.

To avoid these repercussions proper methods of training manpower should be adopted and carefully applied to suit the country's circumstances. For example, the reconstruction of the Egyptian economy and the tremendous expansion in manufacturing during recent years have combined to make the lack of experienced supervisors and senior managers one of the most difficult problems. The difficulty is to provide training facilities for large numbers of this category quickly, and even if these facilities were to be provided, the training process is not easy enough to be compressed into a short period of time.

In Egyptian public enterprises there are three methods from which to choose. First, training within

the enterprise, supplemented where necessary by foreign skills. By this method foremen and other intermediate employees go through three courses: job instruction, (i.e. how to instruct,) job relations, (i.e. how to handle staff effectively) and job methods, (i.e. how to organise work). The merit of this method is that it offers a general programme, which is not confined to the individual industry.(37)

The second method is to establish a supervisory training centre. In this centre supervisors in various enterprises attend courses dealing with technology of their specific industry, techniques of supervision, theoretical and practical study of the condition of labour forces in the public sector as a whole, analysis of methods of training adopted in developed countries and how to adapt them to national conditions and so forth. Such a method requires co-ordination between existing educational institutions and Government assistance.

The third method may be to send some of these supervisors abroad to learn and see the

(37) United Nations. Some problems in the organisation and administration of public enterprise in the industrial field. p.37

efficiency of the supervisors in the firms they visit and suggest various ways of improving productivity and output in their home plants by better production techniques, etc.

If one of these methods is to be adopted in Egyptian public enterprises, it seems practicable to choose the second method. Most of the industrial plants in Egypt are located in two big cities, Cairo and Alexandria, and their suburbs. A centre for teaching supervisors could be placed in these two cities where also the assistance of educational institutions and other facilities are available. Although the other two methods may also be adopted, the main obstacle is the high cost involved in sending supervisors or bringing foreign skills to a great number of enterprises newly established. But, of course, if it is found that in particular enterprises foreign skill is inevitable, as in the iron and steel industry, electricity supply industry, and chemical industries, these two methods may prove superior.

For senior managers and other highly specialised personnel such as accountants, sales managers etc., national sessions, by lectures could be arranged to give a picture of modern techniques and of the progress

made in foreign countries. These lectures could be followed by discussion of practical problems of using these techniques and policies.

Training of skilled labour.

Training skilled labour is also a difficult problem although in Egypt, technical colleges and schools usually cater for a class of skilled labour that may be needed in all kinds of industry. College and school leavers of this kind may be easily adapted to the kind of skill needed in plant training.

Two difficulties have to be faced in connection with skilled labour: first, although it may appear that there is an adequate flow of this class, the problem is that considerable numbers are reluctant to work in a factory where in early industrialisation pioneering service is required. This means that in a newly established enterprise it is expected that welfare facilities would not be sufficient, in addition that technical school leavers prefer to have clerk jobs to avoid difficulties in the new industry. Secondly, facilities required to train this class in the plant are lacking. If these difficulties are to be overcome, two methods of training may be adopted; on-the-job training under skilled guidance by which

the individual undertakes gradually the job he is going to do, or attend a special course of training in a centre under artificial conditions similar to those in the industry.

Perhaps the first method, on-the-job training, may be suitable in Egyptian public enterprises to avoid the cost of establishing a centre of highly expensive equipment.

Training of unskilled labour.

For training unskilled workers, theoretically, there is no problem. The newcomer can be shown what to do, and after a short time he will do the job reasonably well. But practically there may be two problems involved. First, such workers should have had preliminary education, which depends on Government schemes to abolish illiteracy in the country, and secondly, such training may be a costly operation and may result in a loss of material. Handling of expensive material is an example. The proper method in this connection is to provide local technical schools teaching specific cultural background. Enterprises and the government should integrate their efforts to prepare a new type of worker who has besides a specific cultural background, the capacity

to attain an overall perspective of productive processes.

Training in the electricity supply industry.

The electricity supply industry has to employ people of many professions and talents. The technical side of the industry, generation, transmission and distribution requires a considerable number of electrical, mechanical and civil engineers, architects, surveyors and draughtsmen. Also the running and maintenance of power stations and networks depends on a variety of crafts and manual skills such as blacksmiths, electricians, fitters, joiners, linemen and other trades. On the administrative side, the electricity supply industry need highly qualified administrators, accountants, secretaries, clerks and other professions.

In training these people the British electricity supply industry has had a long experience until it has reached a high level of training. Provision for education and training schemes has been introduced in the Electricity Act of 1947. The industry has to provide the facilities for employees at all levels whether technical, administrative or otherwise. In carrying out this duty the Area Boards have to draw

up a general programme for education and training discussed and approved by the National Joint Advisory Council, to be submitted to the Minister concerned. The need for these programmes is increasingly important to provide skilled manpower required for the large construction programmes and distribution networks outlined in the long-term planning of both generation and distribution projects.

The question now is how to train these people, what are the methods adopted in the industry and what is the importance of training schemes? Methods of training in the British electricity supply industry are designed to suit all grades.

For newcomers in the industry, school leavers are trained to be junior operatives and ultimately semi-skilled or skilled workers. The electricity supply industry, in this connection, apply the apprenticeship method, which is applied in most of the engineering industries in Britain. Craft apprenticeship covers all trades in the industry. Under this method trainees are prepared to be electrical fitters, electricians, meter mechanics, joiners and linesmen. Entrants to this class should have, before signing a formal apprenticeship

agreement, six or nine months to gain basic workshop training as a probationary period.(38) They are also given a release of one day a week to attend a city and guild course, following the 'educational incentives'.(39) The contents of these courses are based on the educational standard of the entrant, his age, the type of training to be undertaken, duration of the course and the conditions of the services.

Besides this class, the technical processes of the industry require trained technical engineering staff. The industry draw up graduate training schemes for people already holding qualifications of university degree or higher national certificate standard. Programmes are designed to deal with technical problems of generation, transmission and distribution. These programmes include three courses of two years each by which the trainee would be able to gain all-round experience in the various branches of the industry, and then specialised in one of the three

(38) Self, Henry, & Watson, E.M. Electricity supply industry in G.B. London 1952 p.140

(39) Bellamy, P.G. Aspects of Education and Training Summer school 1962 Electricity Council, p.59

main branches. There is also the engineering apprenticeship method by which some of the entrants into the industry can attend a four or five year course divided into six months in the technical college and six months in the industry every year.

Manual workers in the electricity supply industry are trained on the job, or having within the industry elementary instructions by means of lectures, experimental apparatus, films and so on, concerning the jobs they undertake.

The clerical staff has had no similar schemes of apprenticeship until the N.J.A.C. recommended a method of training this class in 1962. Under this method recruited clerical staff and selected members of the existing staff would have to be trained in a number of departments over a period of three years in office skills. The staff can also attend courses in technical colleges to gain educational qualifications through one-day release every week. Students who show a certain progress can have a chance of training of two more years.(40)

Apart from the specified programmes and methods of training discussed above, the Electricity

(40) Electricity Council Annual Report and Account ending 31st March, 1962 para 172.

Council in Britain undertakes a centralised training scheme. The important example, is the establishing of summer and spring schools. By this method the industry groups all grades in summer or spring in a residential college for one week. The system in these schools is to hear papers and lectures given by members of the electricity authorities, by trade unionists or by some of the students themselves. Subjects taught cover the organisation and development in the industry. Study groups are organised to ask questions to be answered by lecturers.

The idea of this method is twofold: first, to give the chance to employees in the industry to know the top management and to ask questions of particular importance. Secondly, students may get to know each other's work as they live together for a period of time. A combination of these two factors realises the harmony between employees and management required in a successful industry.(41)

The Central Electricity Generating Board run as well a training centre for technical subjects especially

(41) Self, H. & Watson, E.M. Op.Cit. p.139

courses in nuclear power and computing techniques.

In the electricity supply industry in Egypt, no data is available on specific programmes and training methods adopted. But, how far can we adopt the British methods in this context.

As regards the centralised courses, adopted by the Electricity Council and the Generating Board, it may be of great use to adopt them in the Egyptian electricity supply industry with some modification, for example, there is no need for a residential place at the present time, to avoid costs. Technical and managerial qualifications to teach in such schools can, beside the industry's qualifications, be provided by interested people in universities and planning institutions.

Programmes for clerical staff can be successfully applied in Egypt, but instead of one-day release as in British methods, students of this kind in Egypt can attend evening schools available.

Manual workers' methods of training can also be adopted provided that it will be only on-the-job training as mentioned earlier in this section.

The main problem appears to be in applying a suitable method of training newcomers in the industry

to skilled labour, and also the training of high grades such as engineers. As mentioned before, the skilled labour in Egypt generally comes from technical colleges. Thus the most suitable and inexpensive method here is training on the job and probably for those who show a certain progress the industry may grant them more advanced studies in higher technical colleges available for a period of one or two years.

For engineers, there is already a shortage, so it would be impracticable to train them for long periods. The industry may find a suitable method for this class to be trained in the plant, possibly by foreign skills.

The importance of the adopted British methods or the suggestions made for Egypt could be summarised as follows:

- (1) Training employees of the industry of all grades would identify them with the technical and administrative problems of the industry. This is a concept used in all large industries and it is of particular importance in the electricity supply industry because of its technical complexity and to ensure the safety from electricity hazards.

- (2) Technological advancement, for example, the introduction of nuclear power and computing techniques must be known by its technical staff.
- (3) As mentioned in the previous chapter, the importance of recruitment from within the industry requires training of particular groups of employees to fill the top management posts. For example, foremen should have courses teaching them how to conduct day-to-day affairs. They must also be trained to think about the problems that may face the industry.
- (4) Increasing the efficiency of the industry as a whole could be achieved by the training of all employees. But if this is not possible, especially in the short or medium term, it should be accepted that the greater the number of trainee, skilled workers in any of the industry's areas, the better the hope of solving the problem of shortage of skills in the whole industry. This implies that the movement of trained labour from one area to another lacking this particular skill is important, and is a means of solving the problems of redundancy. Trained workers within the electricity supply industry can do

the work in any area.

The problem of mobility is not so easy to solve. Mobility is always associated with economic and social obstacles, such as travelling and resettlement problems: provision of housing, the loss of income for workers transferred carrying relatively lower rates of pay, and the extra cost to the transferred worker while waiting for a house. These problems may be solved by either of two methods: by co-operation between the industry and housing authorities, public or private especially in areas of higher standard of living as London, or the extra costs may be met by an Exchequer subsidy. The N.E.D.C. investigating the problem in the coal industry states that the cost to the Exchequer of such transitional schemes would be small.(42)

Productivity of labour.

The economical staffing in the industry and the technical ability and knowledge resulting from proper methods of training are two of many factors accounting for productivity of labour.

When measuring productivity per labour in different industries two different methods could be

(42) Op.Cit. Report 1963 para 51

applied, one based on output per head, and the other on the value of output per head. On a comparison between different industries in different countries the measurement of output per head involves numerous difficulties. This is due to the fact that individual industries, as classified by the Censuses, each produce a group of products and by-products which are not identical in type and quality. A choice of standard unit cannot overcome completely the lack of homogeneity between different industries. Because of this practical difficulty measurement could be made in terms of value.

In the electricity supply industry productivity per manpower could be measured by output per employee. In comparison between different countries the same method could be applied. For example, figure 12 shows the development of output (measured as thousands KWh.) per employee in Britain from 1925 to 1959.(43) The figure shows that productivity per manpower has increased markedly with the expansion of the supply. The level in 1959 is about three and a half times that on 1925. Such increase is due to the modern

(43) Statistical Diagrammes relating to the Electricity supply industry, Electricity Council 1962 p.12 & 13.

capital equipment used, the improvement of organisation and management and the expansion of supply of electric power to various consumers. But the expansion of supply does not necessarily co-incide with increasing productivity per employee. The N.E.D.C. Report in 1964 shows that the expected increase of manpower in the industry by nearly 3% higher than estimated in the last inquiry published in 1963, would reduce the increase in sales per employee from 42% in KWh sold per employee to 37%.⁽⁴⁴⁾ Other reasons for this estimated decrease is that the higher proportion of workers employed is unrelated to current sales. This means that employment occurs in the development, design and commissioning of generating stations rather than the supply of output.

Figure 13 shows that comparison between different countries on productivity per manpower could be based on putput (thousands KWh) per employee. The difficulty in making a comparison of productivity per manpower in the electricity supply industry between different countries is not because the method of physical output cannot be applied but because of many

(44) N.E.D.C. The growth of the Economy, London
1964 para 228

Efficiency in the Utilisation of Manpower in Electricity Supply

Fig. 13.

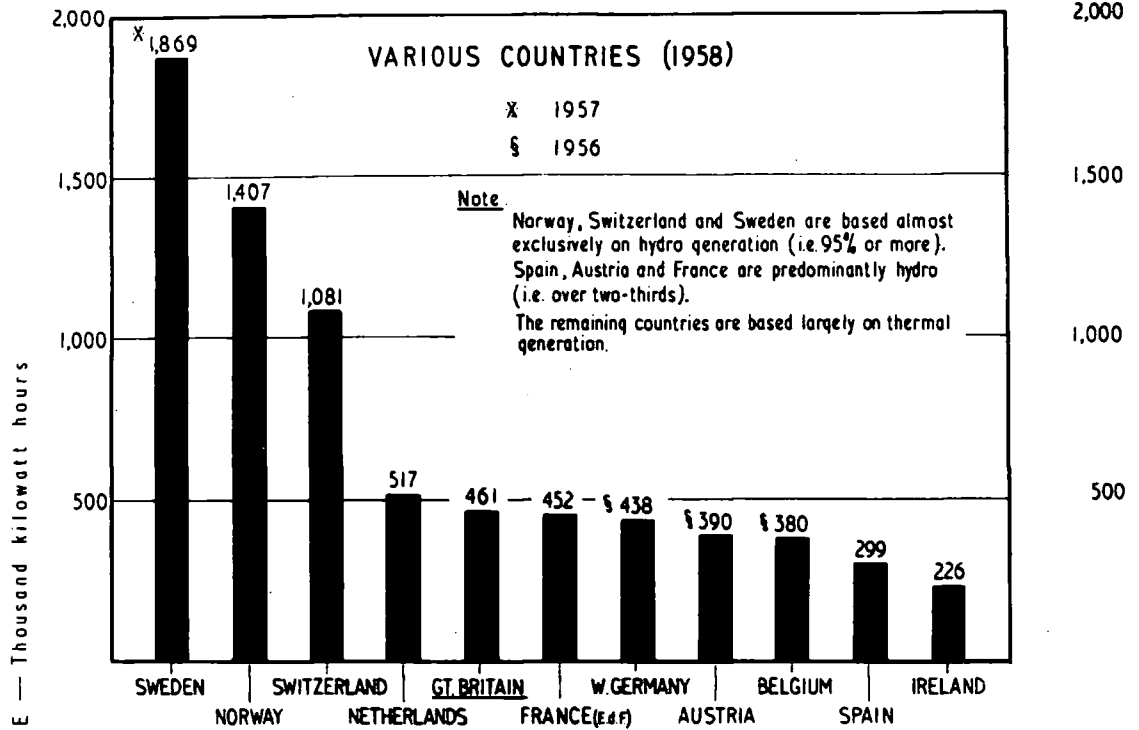
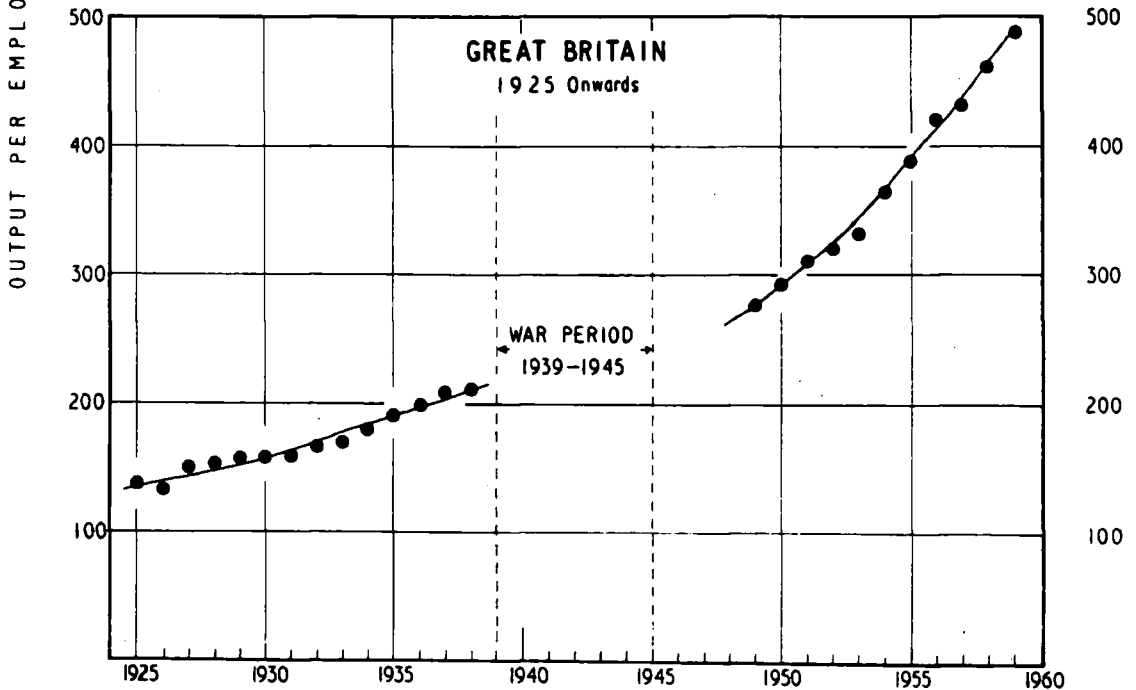


Fig. 12.



other reasons. Some of these are:

- (1) The pattern of electricity supply is different from one country to another according to the natural resources. Some countries generate electricity mainly from thermal power stations such as coal fired, natural gas or oil fired. The size of manpower differs among these types, for instance, coal fired stations need more manpower than the other two. Other countries which have a dominant part of their capacity as hydro-power stations are in a better position, because they can produce the same output or even higher with smaller labour force. In Britain, the dominating method of generation is by coal-fired power stations. In Egypt, there are either oil-fired or natural gas power stations and hydro
Consequently the labour force in the British electricity supply is expected to be higher in Britain than in Egypt assuming that they produce the same output.

Another obvious reason affecting a comparison between different countries is the fact that some countries still use power stations

of lesser efficiency than modern ones. The former need more manpower to operate them. In addition, the interconnecting system of power stations has an effect on the quantity of labour required and accordingly has an effect on the manpower/productivity ratio. A grid and super-grid system improves the productivity per manpower. Here again the situation is greatly different in Britain compared with Egypt: while the grid system in Britain has been in operation since 1936 and it is planned for a super-grid scheme, in Egypt a grid system is planned to be in operation in 1968.

One has also to take into account that some countries import electric current which is accounted in the national output. The importation of electricity supply does not need much manpower.

- (2) The difficulty in comparison between different countries is clear when considering the distribution services of the industry. The more services offered to consumers after connection the more manpower required which has no relation to output of electricity. For example, services

of selling appliances, showrooms, and maintenance of consumers' electric appliances are known in Britain but such services are not offered in Egypt by the electricity supply industry.

Joint services work against a proper comparison. For example, in Egypt electricity and gas consumers' services are managed and operated by the same authority. This means that the same number of employees serve both industries, for instance, reading gas and electricity meters is done by one employee. This method of joint services is not applied in Britain.

- (3) Some countries use modern methods of administration such as computers for billing, mechanisation and centralisation of accounting systems. These methods require less manpower showing higher productivity per employee than other countries which have not such modern techniques.
- (4) Comprehensive figures and statistics showing the volume of output and the quantity of manpower are not available in every country.
- (5) Working hours in the electricity supply industry in different countries may differ greatly. If working hours in a particular country are less than in

another country, this means more manpower in operation and consequently less productivity per employee.

These reasons do not mean that comparison between two countries or several countries of productivity per employee is impossible. Comparison based on figures would give an indication of the problem. The O.E.E.G. Report 1960 shows a comparison of this kind in the electricity supply industry between several countries of Europe shown in the following table and Figure 13.

Comparison based on these figures shows that there are four countries of higher output per employee than the United Kingdom. But when it is known that the first three countries use mainly hydro-electric power stations and the Netherlands does not undertake extensive consumer services as in Britain, this may indicate that Britain is in a more favourable position than shown in the table.

A comparison of productivity per manpower in the electricity supply industry between Britain and Egypt would show a much lower productivity per manpower in Egypt than in Britain.⁽⁴⁵⁾ Two sets of

(45) Although there is a Joint Services of electricity and gas industries in Egypt, the proportion of gas services is very low which could put the comparison to a large extent right.

TABLE 14.

THOUSAND KWh PER EMPLOYEE.

Sweden	Norway	Switzerland	Netherland	U.K.	France	Germany	Austria	Belgium	Spain	Ireland
x					o	o	o			
1869	1407	1081	517	483	441	438	390	380	299	226
		x 1957	o 1956							

reasons may explain this position.

First, factors which influence the electricity supply industry. These are:

- (1) Consumption per capita in Egypt is much lower than in Britain as we have seen earlier in the chapter.(46) This means that if consumption per capita rises output will be increased owing to a better utilization factor. At the same time an increase of output does not require a similar rate of increase of numbers employed.
- (2) Production of electricity is not yet interconnected in a grid system in Egypt. This means that smaller units used in areas lacking connection need more manpower. In addition, there are large industrial companies using their own power stations.

For these reasons the electricity supply system in Egypt requires more manpower and consequently has a lower productivity. However, there are two factors working in favour of Egypt compared with Britain; one is that the proportion of hydro generation, though it is relatively low, is still higher than in Britain. The other factor

(46) See page 165

is the fact that consumers' services in Egypt, like displaying electric appliances and selling them, are not known.

Even if we allow for these two factors, productivity of manpower in Egypt is much lower than in Britain. In addition to the reasons mentioned there are many general reasons accounting for lower productivity of labour in the Egyptian industry as a whole, which have the same effect on the electricity supply industry. The following are the most important reasons.

- (1) The socio-economic structure in Egypt is bound to result in a low level of productivity, e.g. the low standard of health and of housing conditions.
- (2) Illiteracy, though its proportion has been lowered in recent years, still influences the supply of efficient manpower.
- (3) The lack of an effective collective bargaining structure and the abundance of supply of labour means that labour receives a reward less than its marginal productivity.

- (4) The absence of economical staffing and the lack of sufficient technical ability and knowledge as mentioned at the beginning of this section.
- (5) The high rate of absenteeism, the large labour turnover, industrial fatigue due to long hours of work and the instability of labour affect productivity.

(47) Said, G. Some aspects and problems of industrialisation in Egypt, Cairo p.73

Conclusion.

The discussion above shows the following results.

First: for manpower planning it is important to know the trend of increase or decrease in the size of manpower.

Second: technical progress is a common feature in British nationalised industries, which usually result in a decreasing in numbers of manpower required. In the British electricity supply industry, though, there is also technical progress but there is a tendency towards increase in manpower. This is due to the high rate of expansion in the electricity supply industry especially in the distribution side which is not affected much by technical improvements.

Third: it is obvious from the discussion that the problem of skilled manpower in Egypt deserves more attention. In the electricity supply industry, the problem of skilled manpower in nuclear generation could be solved by recruiting young qualified workers.

Fourth: to provide skilled labour required in public enterprises and in the electricity supply industry a comprehensive education and training scheme is necessary. For every grade of employees and workers

a specific training programme has to be designed. In Egypt, it is suggested that a supervisory training centre is appropriate, for training foremen and middle personnel, national sessions for senior managers, on-the-job training for skilled labour and preliminary cultural education for manual workers.

In the electricity supply industry, methods adopted by the British industry could be usefully applied in Egypt with some necessary modifications to suit the Egyptian economy.

Fifth: for a given output in a given industry the size of manpower and the provision of the required skill are two main factors among others to increase productivity per man.

Lastly: to increase productivity per man is the main aim of manpower planning in the electricity supply industry.

To compare productivity per man, in the electricity supply industry, between two countries is an extremely difficult matter, because of different patterns of supply, different systems of distribution sources, different methods of administration and lack of statistics required.

However, as an indication, in a comparison between Britain and Egypt, it is concluded that productivity per man, in the electricity supply industry, in Egypt is much lower than in Britain.

Financial Planning.

Every project must provide an answer to the basic question, how to finance it. This raises the problem of allocating funds through the market by public loans guaranteed or not guaranteed by the Government or Exchequer advances or self-financing.

In this section, examination of these problems, within the public sector and particularly the electricity supply industry, will be made.

Generally speaking the total sum appropriated reflects the relative importance of the projects, within the frame of a particular sector (public or private) and consequently within the national economy as a whole. In Britain, the common feature of nearly all the nationalised industries is the large capital requirements for new programmes. For example, throughout the 1950s more than a third of the nation's total fixed capital formation took place in the public sector and of this nearly a half was in the nationalised industries including the Post Office.(48) According to the N.E.D.C. Report of 1964, the total investment in the public sector was £1513 million in 1961 rising to £1551 million in 1962 and £163-

(48) Shanks, M. (Ed.) Lessons of public enterprises
London 1963 p.34

million in 1963. Estimation on the basis of 4% growth will be an average of £2025 million in 1964/65 and £2280 million in 1966.(49) The electricity supply industry has usually a big share in the total capital requirement in the public sector. The gross fixed investment in the industry was £360 million in 1961 and £398 million in 1962. It is expected to rise to a sum of £694 million in 1966.(50) The coal, railways and gas industries invest annually about £100 million, £75 million and £50 million respectively in capital expansion.

Similarly in Egypt the important role of the public business sector in development plans has been well manifested by the fact that appropriation of the Development Budget amounted to £E286 million in 1960/61 and £E315 million in 1961/62. In 1962/63 the share of the public business sector in the National Budget was £E493.4 million.(51) The allocation of these sums expresses, in terms of money, the relative importance of the projects; it also determines the implementation of the public enterprises' plans. This leads us to the question of how to finance these programmes.

(49) Op.Cit. para 119.

(50) N.E.D.C. March 1964 para 110.

(51) National Bank of Egypt Economic bulletin Vol.XV
Nos. 2 & 3 p.114.

The three main sources of financing capital programmes in public enterprises are:

- (1) by issuing stocks in the market guaranteed or not by the Government.
- (2) by Exchequer advances or
- (3) from the commercial earnings of the industry.

The British experience:

Initially, public corporations in Britain have been granted financial autonomy. It was thought that one of the main advantages of choosing the public corporation to govern the nationalised industries is its financial independence. The main reason for such independence was to ensure the business flexibility of the industry concerned. In fact, the pre-war corporations had this independence. The Port of London Authority was the first example. The Authority's assets were capitalised by means of the issue of its own stock. Similarly this was the position of the Central Electricity Board and the London Passenger Transport Board. The principle of issuing their stock kept them immune from governmental scrutiny. In the case of the post-war public corporation, two main factors worked against this independence: first, the shortage of sufficient

surpluses to enable them to finance their programmes without borrowing, and secondly, the fact that the state may have to use the nationalised industries to manipulate the levers of the economy. The first factor is clear from the large capital invested by these industries every year which self-financing, while impossible in some industries such as the railways, only a small proportion in other industries such as electricity and gas. The second factor could be seen in the government interference in prices and other commercial activities for the national interest. An additional factor, which affected the ideal of financial independence of the public corporation, is that the Government wished to provide cheaper loans to them. This could only be done by direct borrowing from the Exchequer or by providing a treasury guarantee for the money raised from the market. Thus the argument shows that financial independence of the public corporations has been greatly reduced by Government measures. Nevertheless there are some features of financial independence of public corporations which govern the British nationalised industries. The fact that they are not included in the National Budget. Their estimates of income and

expenditure have not to have the approval of Parliament. Their accounts are audited by professional auditors and not by the Comptroller and the Auditor General. The published accounts of the nationalised industries are in the form which conform with the commercial standards, the accounts include separate operating and financial results for each main activity of the Board. (52)

It is true that there are some features of financial independence, but this does not mean that the actual performance of corporations' financial activities are within their management's discretion.

However, the common pattern followed by most of the nationalisation Acts was that the Treasury should guarantee all stocks issued in the market. The nationalised electricity, gas and transport industries were authorised by statutes governing them to issue such guaranteed stock. The coal industry was different, its operations had to be financed by Advances from the Treasury. It can also, as well as the other nationalised industries, borrow temporarily by way of overdrafts from the banking system authorised by the Ministers concerned and subject to a defined limit by statutes.

(52) Budgeting in public authorities, by a study group of the Royal Institute of Public Administration 1959 p.41.

The borrowing powers of each of the nationalised industries are limited, and may be changed every year, according to the requirements of the industry as we shall see in the case of the electricity supply industry. Before 1956 the nationalised industries were authorised to borrow from the market within the defined limits. The reason for borrowing limits is that development programmes in these industries require a large amount of funds which may have a direct impact on the capital market and consequently on the economy as a whole. Thus the Government has to have a voice in deciding the borrowing policies of the nationalised industries. This could be clear if we know that only the capital expenditure of the electricity supply industry on property, plant and equipment amounted to £469 million in 1963/64.(53) This amount was 20 million (4%) less than the amount approved by the Minister as it was stated in the White Paper "Public investment in G.B.", October 1963 Cmnd 2177. This is shown in the following table.(15)

(53) Electricity Council, Annual Report and Accounts 1963/64 para 35.

TABLE 15.
CAPITAL EXPENDITURE IN BRITISH
ELECTRICITY SUPPLY INDUSTRY.

(million pounds)

	Approved estimate	Actual expenditure
Generating board	334.0	310.1
Area boards	155.0	159.4
Total	489.0	469.5

Other nationalised industries also invest a great amount of money especially transport and coal as was mentioned earlier in this section.

In 1956 all stock issues ceased and the money for all nationalised industries, at present, is to be provided directly by Exchequer Advances. This was a result of an issue by the electricity supply industry amounting to £200 which was heavily undersubscribed and consequently imposed a heavy burden on the Bank of England. In this respect, the controversy arises is whether the nationalised industries should go to the market for borrowing or should rely only on Exchequer Advances. On one hand the Herbert Committee recommended that nationalised industries should compete for capital funds on the market without the support of the Treasury guarantee. This

would encourage the efficient use of capital.(54) As regards electricity, the Committee recommended the amendment of the Electricity Act "so that each Board would go to the market for its own capital requirements and so assume a more direct responsibility for the raising and spending of capital."(55) They stated that "short of this it is very difficult to achieve full efficiency."(56) It is also argued that the system of guaranteed stock or Exchequer advances depends upon political rather than rational economic considerations. This may result in an expansion of the nationalised industries at the expense of other businesses in the economy. Professor Edwards and Townsend stated that "publicly owned industries just because they are publicly owned should not make less remunerative investments than those available in private industry."(57) Kelf-Cohen arrived at a similar conclusion to the Herbert Report, hoping that the Government would take the decisive step of authorising the Treasury

(54) Para 348-51

(55) Para 353

(56) Para 348

(57) Op.Cit. Business enterprises p.514

to draw up the necessary regulations under which the board of any nationalised industry would be empowered to go on to the market to borrow.(58)

On the other hand, the Committee on the working of the Monetary System reported that in 1955 there was an increasing difficulty in selling nationalised industries' stocks to the public and a succession of such issues had to be taken up almost entirely by the Issue Department, which would mean financing the industries from the Exchequer. As a result the Finance Act of 1956 gave power to the Treasury to make advances of long-term capital to these industries.(59)

Another Report on 'The financial and Economic obligations of the nationalised industries', 1961, stated that unguaranteed borrowing is not realistic, because the amounts of money needed are much too large to be raised in the open market without the Government's support. These industries are considered by the public as closely associated with the Government. Thus it would be difficult for the

(58) Op.Cit. Nationalisation in Britain p.194

(59) Committee on working of the Monetary System Report, August 1959, Cmnd. 827 para 87

market to regard them as independent financial concerns.(60) Also Professor Robson described fighting for capital as being unrealistic. He gave two reasons for this. First, the market has not sufficient strength to provide the large capital requirements of these industries. Secondly, the picture of a kind of all-out wrestling match or scrimmage among the dignified gentlemen who direct the affairs of our great joint-stock companies in a strenuous attempt to secure for their companies the hard-won savings of the investor is a purely imaginary one.'(61) In summing up, the argument seems in favour of the existing system which implies that the nationalised industries should not compete with private enterprises in the open market. In addition to the reasons given above, two reasons can be added.

First, because of the monopolistic or semi-monopolistic position which the nationalised industries enjoy, they can easily compete with the private sector, by offering a high rate of interest. But this must be passed on to the consumer which is against the national interest.

(60) Op.Cit. Cmmnd. 1337 para 27

(61) Op.Cit. Nationalised industry and public ownership p.309

Secondly, it is not realistic to compare private enterprises with public enterprises in as much as the former only go to the market for a small proportion of their financial requirements. The rest is always found from commercial earnings. The latter have usually a small proportion of self-financing.

This leads us to the problem of self-financing. In a recent argument on the problem in the British nationalised industries, the White Paper on the Financial and Economic Obligations states that experience has shown a general need for the nationalised industries to build up adequate reserves to deal with contingencies. The White Paper goes on: 'there are powerful grounds in the national interest for requiring these undertakings to make a substantial contribution towards the cost of their capital development out of their own earnings, and so reduce their claims upon the nations's savings and the burden on the Exchequer.'(62) The argument of the Herbert Committee, in this context, is that if the profits of the industry are ploughed back as capital, the

(62) Op.Cit. para 22.

present consumer who purchases the industry's goods and services is fined by paying costs which ought to be spread over a period of years. The Report states 'to use prices charged to the consumers as a device for raising capital for expansion is to impose compulsory saving on electricity users; to make them pay, so to speak, a tax in proportion to their electricity consumption so that the community may build up the electricity industry for the benefit of future consumers. To make present consumers subsidise in this way the capital requirements of future consumers would be quite inequitable and also it leads to inefficiency.' This is also stressing the Committee's argument for raising capital from the market. Another point of view against a high ratio of self-financing is the probable effect of reducing the volume of investment below what is profitable. This means that nationalised industries are assumed to be able to raise prices on the grounds of inelastic demand for their products and services which is not realistic.(63) This is true if we adopt the

(63) Foster, C.D. The cost of financing the nationalised industries, Institute of Statistics, Oxford May 1960 p.102

idea that nationalised industries should provide their goods and services at the cheapest possible rate.

The main objection against the above argument is that a public enterprise is avoiding making profits, this will make higher profits available to private enterprises at the expense of the public sector. This is economically damaging to rentiers in those nationalised industries which face substitutes in the private sector.(64)

In fact, one could not be dogmatic in dealing with this problem. The ratio of self-financing largely depends on the principles on which the industry is working. The general economic factors which may determine the degree of self-financing are the price/cost ratio, the relationship between depreciation provisions and gross investment, the relationship between capital requirements and turnover, and the rate of growth in the industry. For example, a fast-growing industry with a high capital/output ratio, where prices are not much above average cost, would require a high proportion of outside finance. On the other hand an industry

(64) Hughes, J. Nationalised industries in the mixed economy. Fabian Tract 328 1960, in Hanson Ed. Nationalisation p.272

with a lower capital/output ratio and a low rate of growth would require a high rate of self-finance. Taking these factors into consideration, a rigid determination of self-financing ratio will lead to wrong pricing and investment policies.

Let us now examine the methods of financing Egyptian public enterprises and give some examples.

Financing Egyptian public enterprises.

As most of Egyptian public enterprises before 1956 were run by Government Departments, the normal procedure for financing their capital requirements was to draw up estimates for the coming financial year. These estimates were subject to the consent of the Minister concerned and of the cabinet. Their accounts were audited by the Auditor General. Such a method has proved inappropriate for a public enterprise especially of a manufacturing nature. The delay involved in the sanction of these estimates and the extremely limited freedom of managers in financial operations were the main reasons. Hanson suggests some modifications to this method. "A distinction may be made between current and capital expenditures, estimating and appropriation controls relaxed in various ways,

'revolving funds' established, "and so forth. He believes that such modifications may enable the enterprise to behave in a more business-like way and help it to achieve solvency.(65)

Another method of financing used was the creation of the Industrial Bank in 1949. The Bank was to provide capital to all enterprises including public ones. The Bank was empowered to participate in the capitalisation of industrial enterprises, and to grant short-term advances with securities and medium-term loans (66), and long-term loans for the creation of new enterprises.(67) This method has shown reasonable success in financing the Egyptian public enterprises.(68) The loans of the Industrial Bank rose from £2 million in 1958 to £4.2 million in 1960, particularly medium and long-term loans which had appreciably increased to 38% of the total in 1960.(69) According to

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- (65) Hanson, A.H. Public enterprise and economic development. London 1959 p.423
- (66) United Nations. Processes and problems of industrialisation in under-developed countries New York 1955 p.56
- (67) Issawi. C. Egypt in revolution p.265
- (68) Taking into consideration that after 1956 nationalisation of large group of industries which were financed partly by the Industrial Bank.
- (69) Issawi. C. Op.Cit. p.266

Hanson, there is no objection to this method provided that the Government retains sufficient control of the Bank's operation.(70) During this period the public sector included a large number of commercial and industrial organisations.

In addition to the participation of the Industrial Bank, the financing of these organisations' capital requirements was supplied from their commercial profits and if necessary from financial aid of grants from the National Budget.

In a Budget Statement by the Minister of the Treasury in 1961, a new practice has been introduced. Instead of aid from the National Budget, the Government enabled these organisations, through the Government's guarantee, to have recourse to the Central Bank of Egypt.(71) They can obtain the necessary funds as repayable loans. The Government's aim was twofold: first, financial control over the Organisation's recourse to public funds, and second, the repayment of the loans, together with the interest was apt to show the degree of real success which any of these Organisations may achieve in

(70) Hanson, A.H. Public enterprise and economic development p.425

(71) N:B.E. Economic Bulletin Vol. XIV No. 2
1961 p.132

their commercial and industrial activities.

The financing of the Egyptian public sector is not only supplied by domestic resources but also, and of special importance, by external sources of capital. Methods of external finance to Egyptian public enterprises can be broadly classified into:

- (a) improvements in the terms of foreign trade, and
- (b) foreign aid.

In Egypt, international trade can play a major part in financing public enterprises. Cotton exports, when its prices rise and result in an improvement in the terms of trade, can put at the disposal of Egypt additional outside resources of foreign currencies that can be used to promote industrial development in the public sector.

Foreign aid, through loans from countries where capital is more plentiful, is an obvious way to supply capital. Some of the investment programmes in communication and electric power have been dependent upon public borrowing from foreign sources. Foreign capital is available from the great capital markets in Japan, Germany, the U.S.A. etc., or from International Finance Organisations such as the International Bank of

Reconstruction and the U.S.A. Export-Import Bank, and from U.S.S.R.. But consideration must be given not only to the circumstances of capital importing countries and their foreign relations but also to factors in the world situation as a whole. The factors affecting this method of finance are partly, the fear of arbitrary acts by Governments of capital importing countries, such as nationalisation, or double taxation, or exchange control preventing remittance of capital and profits in foreign currency and the fear of lack of technical staff to operate efficiently large new undertakings.(72) It should be noted that these credit facilities from foreign countries can be either obtained through the Egyptian Government or directly between the public enterprise concerned and the foreign capital market.(73)

Owing to the remarkable expansion of the Egyptian public sector after the end of 1961 and consequently to the development of its functions, the Government took important and direct role in financing public enterprises. This was clear from

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- (72) Saied, G.M. Some aspects and problems of industrialisation in Egypt with special reference to problems of finance. Cairo 1958 p.36
- (73) Egyptian economic and political review April 1961 p.27

the new budgetary system introduced in 1962/63. The important feature of the National Budget of this year was the link between the public sector's plans and the national plan for economic and social development. In examining the public sector's share in this Budget an important distinction has to be made. A public business sector working as a producer of goods and services for sale, and a public service sector which provides particular services free of charge.

The problem here is how the first category i.e. public business sector is financed from the National Budget.

Traditionally the National Budget is used for fiscal control, but after the incorporation of the public business sector, it is used now in part as a tool for implementing the sector's plans. Thus the public business sector appears in a section separate from the National Budget. In financing these plans two concepts are used, a narrow one, which includes public authorities and public organisations, and a broad one, which includes, in addition, the companies affiliated to public Organisations.(74)

To explain this complex system, I chose the latest available data from the 1962/63 Budget in which total public expenditure estimated for the year was £E1,012.6 million out of which £E519.2 million was for the Service Budget and £E493.4 million was for the business Budget.

Capital requirements in this latter figure amounted to £E275.1 million allocated as follows:

Public authorities and organisations	£E 179.7 million
Affiliated companies	£E 95.4 million

An attempt has been made to find the sources of financing this capital and the results are as follows:

Self-financing	£E 59.9 million
Social insurance and pensions reserves	48.5 million
Government subscription	19.2 million
Foreign loans	33.5 million
Domestic loans	114.0 million
<hr/>	
Total	£E 275.1 million

The public business sector depends on its own resources to the extent of £E108.4 out of which £E59.9 retained as a surplus are available for investment and £E48.5 represent the increase in

the resources of the Social Insurance and Pensions fund. In addition the Treasury subscribed £E19.2 million through the Central Bank. Regarding this particular year foreign loan credit facilities available in the National Budget amounted to £E325.8 million out of which £E84.5 million were reserved for the whole public sector. As shown above foreign loans required amounted to only £E33.5 million. Thus it would be easy for the public business sector to get the foreign capital required. Domestic loans, which are ultimately provided from private savings were not lacking either. Again in this year, national savings were estimated at £E302.0 (£E147.6 public savings and £E154.4 private savings), and it was estimated that the private sector would require only £E241, so the rest would be available for lending to the public sector including the business category.(75) These then are the various methods of financing public enterprises in Egypt. In practice the methods adopted differ from one Organisation to another according to its financial position. For example, while the Central Railways Authority finances its

(75) Figures for the Budget 1962/63 are mainly from the National Bank of Egypt, Economic Bulletin Vol. XV No. 2 and 3 1962.

capital mainly from internal resources, the E.D.O. depends largely on long-term loans and small proportions of internal resources. To illustrate this, two examples will be given in more detail.

Central Railways Authority.

Before this authority became an independent entity it was a Government Department attached to the Ministry of Communications. Its financial requirements were regulated by the following laws:

- (1) According to Law No. 25 of 1931 capital programmes ought to be formed from the industry's revenue. Capital requirements were not to exceed 65% of the expected revenue, subject to reconsiderations by the cabinet.
- (2) Law No. 104 of 1949 (Sec. 5) increased the above percentage to 75% of the revenue retained by the Department. This percentage not only includes new capital requirements but also all other expenditures.

The estimated amount of capital expenditure had to be submitted to the Ministry of Finance which had full authority to approve or refuse the sums required. Accordingly the industry has had many delays in implementing its future plans.(76)

(76) Abu-Ismaïl Ahmed. The financial results of government exploitation of railways in 25 years 1925/50 Egypte contemporaine Vol.43 1952 p.35 (in Arabic)

Even after the re-organisation of the Authority and the evolution of its plan in the last decade, self-financing was still a large proportion. From examination of the Authority's Budget in 1961/62 it is noticeable that expenditure was estimated at £E22.5 million out of which £E19,785,878 were running expenses and the remaining £E2,714,122 were reserved for amortization of materials. On the other hand the revenue of the enterprise was estimated at 24 millions. The excess of receipts over expenditure is therefore £E1.5 million. There are two kinds of programmes to be financed: renewals of materials financed from the amortization fund, as in this particular year, amounted to £E2,714,122 which have been charged to expenditure. New plans estimated in 1961/62 would require £E2.5 million. This would be supplied from the excess or reserve over expenditure amounting to £E1.5 million and the remaining £E1 million would be provided by the Treasury.(77) Thus the self-financing ratio in the case of the railways is 60%.

The E.D.O.

As has been mentioned in Chapter 2, the E.D.O. is the largest public Organisation in Egypt.

(77) Egyptian economic and political review
July 1958 p.43

Its investment programmes cover many fields of the economy. Since its establishment in 1957, capital investment of its future plans has been steadily increased as shown in Table 16.

TABLE 16.

INVESTMENT IN VARIOUS FIELDS.

Sectors	1957		1958		1959	
	L.E. m.	%	L.E. m.	%	L.E. m.	%
Banks	4.8	10.1	6.2	10.7	6.6	10.2
Insurance	0.4	0.8	1.0	1.7	1.0	1.5
Mining	5.4	11.4	4.4	7.6	6.2	9.6
Industry & trade	33.5	70.8	46.9	70.8	45.3	69.8
Transport	3.2	6.9	5.3	9.2	5.8	8.9
Total	47.3	100.0	57.8	100.0	64.0	100.0

The financing of this capital could be shown from the balance sheets of the three successive years. Table 17.

TABLE 17.

THE BALANCE SHEET AS ON 31st DECEMBER.

<u>Liabilities</u>	<u>£E 000's</u>		
	1957	1958	1959
Capital and reserves capital	28,361	26,116	26,125
Reserves and profits long-term loans	-	2,039	3,541
General sequestration authority	16,507	19,386	20,557
Banks and others short-term loans	2,100	9,800	14,600
Banks and others creditors	0,499	1,228	1,641
Total	47,467	58,569	66,464
<u>Assets</u>			
Investments	47,236	58,004	64,920
Lands and other assets	-	0,109	0,109
Cash and other debtors	0,231	0,456	1,435
Total	47,467	58,569	66,464

(78)

The table shows that most of the funds required within the three years came from long-term loans obtained from the General Sequestration Authority and from the banking system, while financing from the Organisation's profits and reserves are of a small proportion. The table

(78) N.B.E. Vol. XIV No. 1. 1961 p.74

The figure 0,456 (Cash and other debtors in 1958) is shown in the reference as 0.656

also shows a feasible increase in overdrafts from the banking system with the three years in question. If we take the example of 1959, it can be seen that long-term loans are £E35.1 million, internal profits are £E3.5 million and banking overdrafts were £E1.6 million.

The E.D.O. was authorised since its creation in 1957 to borrow from the market with Government guarantee. Under Law No. 183 of 1957, it could raise its funds up to £E15 million. Interest charges were to be borne by the Government for a period of five years from the date of the promulgating of this law.

Under Law No. 2 of 1960 the E.D.O. had to borrow directly from the National Bank of Egypt within a prescribed limit of £E25 million.(79)

In addition to the above examples, other public enterprises were financed directly from the Government. For example, the capital requirements for the National Production Council in the years 1952/53 to 1955 were allocated by the following methods:

- (1) from revaluation of gold balances.
- (2) from domestic loans issued by the Government and

(79) Egyptian economic and political review
June/July 1960.

(3) from the National Budget.(80)

Financing of British Electricity Supply Projects.

It has been mentioned earlier in this chapter that the economic problems of the electricity supply industry are the results of its expansion to meet the steady increase in demand. It is the duty of the industry to satisfy this demand which needs a continuous re-inforcement and maintenance of the system and the installation of new generation, transmission and distribution equipment. This involves a large capital investment.

In Britain, planning for the financing of the industry's programmes is one of the major tasks of the Electricity Council. They review every spring the investment programmes of the Generating Board and the twelve Area Boards, then the consolidated programme for the whole industry is agreed and submitted to the Minister of Power for approval.(81) This consolidated programme includes the estimated amounts of money required for its implementation and the possible sources of finances.

(80) Egyptian economic and political review
August 1959.

(81) Edwards, R. The organisation and policy of the nationalised electricity supply in G.B.
Electricity Council 1964 p.22

This is done separately by each of the twelve Area Boards in England and Wales and the Generating Board. As regards the long-term estimate of the capital requirements, the Boards take into consideration the latest information by reviewing them annually. The process is described by Professor R. Edwards as follows:

"The Boards' forecasts are forwarded to the Electricity Council in mid-January. Copies of the Boards' estimates are sent by the Council immediately to the Ministry, so that the process of consultation and approval may be concentrated into as short a period as is consonant with efficiency. Consultation between Boards and the Council Headquarters takes place in the next ensuing two months and the capital estimates are reviewed by the Finance Committee of the Council and then by the Council itself. By the time this process of consultation is approaching completion, the Boards will have experienced one more winter's weather, and in the light of this later knowledge of peak demands the Boards and the Council may modify their forecasts and estimates.

When the Council has completed its review, it submits to the Minister of Power a consolidated

statement of programmes for the industry as a whole. Having made his own view, the Minister gives approval, in July or August, to the Boards' programmes and to the incurring of capital expenditure of a certain amount (which may, of course, be less than was proposed) during the succeeding year, and provisional approval for the year beyond that. And so the process goes one step forward each year, the provisional figures being finally approved or varied, and a new set of provisional figures being adopted for the next ensuing year."(82)

Knowing the procedure by which the capital requirements are applied for and supposing that they are approved, we have to know the sources for supplying such capital.

Financing the electricity supply industry in Britain is also based on two main sources, borrowing and self-financing. Since nationalisation the British electricity supply industry's authorities have tried to obtain a reasonable balance between both sources. The industry cannot meet all its

(82) Edwards, R. The finance of Electricity supply
Lloyds Bank Review 1960 Pp.24/25

financial requirements from internal resources, and it is necessary to borrow. There are long-term loans provided initially by the market and now by Exchequer Advances. The first long-term borrowing powers of the industry since nationalisation were under a ceiling of £700 million and have since been increased considerably. In 1953 the Government increased borrowing powers by a further £700 million to reach £1,400 million by which it was expected to meet the requirements until 1959. The method of borrowing was by stock issues treated in the market as gilt-edged and the Treasury may guarantee the redemption or repayment of such stock. In 1955 the industry issued a sum of £200 million at $4\frac{1}{2}\%$, attractive as it was thought, but it was much undersubscribed which resulted in abandoning this method. Under the Finance Act of 1956 and subsequent enactments and under section (15) 3 of the Electricity Act of 1957 the Electricity Council was authorised to raise money (within the overall statutory limits) by obtaining Exchequer Advances. They are repayable by way of annual instalments over a period of 25 years. These Advances carry a permanent fixed rate of interest. The Treasury

decides from time to time this rate taking into account market rates for Government stocks. For example, whereas the industry had borrowed at vesting date at 3% per annum, the current rate of Exchequer Advances is $5\frac{5}{8}\%$.(83) These Advances are financed out of Budget surpluses or by the Government's own borrowing. The Electricity Borrowing Powers Act of 1959 set a limit to the industry's overall statutory borrowing of £1,800 million, and not exceeding £2,300 million to be specified by order of the Minister of Power subject to the consent of Parliament. The increase of this borrowing ceiling happened after the industry's long-term plan formulated in 1958 in which the Generating Board and the Area Boards showed that the capital requirements over the seven years to 1965 made an aggregate capital requirement of £2,130 million. The Electricity Borrowing Power Order of 1961 raised the industry's borrowing limit to the full £2,300 million. According to the additional investment requirement it was expected that the limit of £2,300 million would be reached by the middle of 1964 instead of

(83) Drummond, J.M. The finance of electrical supply, Electricity Council Spring School 1963 p.30

early 1965 as was expected at the time of the 1959 Act.(84)

Under the Electricity and Gas Act of 1963 the borrowing limits were increased to £3,300 million or a larger sum not exceeding £4,400 million. This is expected to cover the industry's requirements until about 1966 and 1970 respectively.(85)

The sources of short-term borrowing consist of the London Clearing Banks, the Trustees of the industry's superannuation schemes and of subsidiary companies. The limits of this temporary borrowing are imposed by the Minister after consultation with the Treasury.

Besides long and short-term borrowing powers, the British electricity supply industry has been able to finance a fair proportion of its capital requirements from its internal resources. The level of self-financing in the industry is closely connected with the problems of the enormous capital required for planned schemes and the power of the industry to charge prices as close as possible to costs.

(84) Electricity Council, Finance for more power
1963 p.15

(85) Electricity Council, Annual Report and Accounts
1963/64 p.42

For these reasons the self-financing ratio of financing the industry's projects differ between the pre-nationalisation and post-nationalisation periods. For example, during the 1930's the level of self-financing in the industry averaged about 60%.(86) During the years 1948/49 to 1957/58 the ratio of self-financing was 42%. The highest in any year being 48% in 1953/54.

In Power for the future published by the Electricity Council in 1958, it was expected that a proportion of about 48.6% would be financed from internal resources. In the whole three years from 1958 to March 1961 the proportion of self-financing was 45.6%.(87) This means that to achieve the target of 48.6% for the seven years of planning, the industry had to find from internal resources a percentage of over 50% in the remaining four years. But, as is shown in Table 18, the proportion during the last five years and the estimate for the next three years ending March 1967, the target in the 1958 plan was not achieved.

(86) Marsh, N.E. Electricity supply - looking to the future, Electricity Council Spring school 1963 p.3

(87) Electricity Council, Finance for power 1961 p.21

TABLE 18.RATIO OF SELF-FINANCE.

	59/60		60/61		61/62		62/63		63/64		64/65		Estimated 65/66		66/67	
	m£	%	m£	%	m£	%	m£	%	m£	%	m£	%	m£	%	m£	%
Total capital requirement	304.5	100	289.4	100	326.5	100	380	100	464.5	100	518.3	100	521.5	100	528.6	100
Internal resources	132.8	43.6	133.6	46.2	152.8	46.8	181.8	47.8	222.4	47.9	250.2	48.3	273.4	52.4	298	56.4
Net borrowing	171.7	56.4	155.8	53.8	173.7	53.2	198.8	52.2	242.1	52.1	268.1	51.7	248.1	47.6	230.6	43.6

Calculated to achieve (with depreciation and interest) 12½% gross return on average net assets during the five-year period.

The table also shows the other target which had been set in 1961 at which it was argued that for the five years ending 1966/67, the gross return on net investment should be not less than $12\frac{1}{2}\%$ calculated as follows:

Interest on loans	$4\frac{1}{2}\%$
Depreciation fund	$5\frac{3}{4}\%$
Surplus	$2\frac{1}{4}\%$
	$12\frac{1}{2}\%$

From this rate of return the plan expected that the industry would meet half of it from internal resources. It was also considered as practicable that in the early years the rate of return would be slightly higher than planned.(88)

From the setting up of the above actual and estimated figures, and the error in predicting the proper ratio of self-financing, it is difficult to discover the principle which the industry has to follow. As has been mentioned at the beginning of this section some economists think that excessive self-financing is wrong in principle; on the other hand others have expressed the view "that the nationalised industries be told that in the future

(88) Electricity Council, Finance for power p.16

they will have to find all their capital requirements by internal finance."(89) Professor Ronald Edwards says that to generate the whole capital requirements through prices would mean that revenues from consumers would have to be increased by more than 25%. How much more would depend on consequential tax liabilities and the elasticity of demand for electricity.(90)

Financing of Egyptian electricity supply projects.

The first important feature characterising the capital requirements for financing the Egyptian electricity supply projects is the large proportion of foreign capital. In the first five-year plan 1960-65, the total estimated capital required was £E253.5 out of which £E153,s was foreign capital. The total capital was to be divided between the U.A.R. Electricity Commission and the Power Producing Departments. Each was authorised to spend a limited amount on their projects, as stated in detail in Appendix (7) Foreign capital is important in Egypt's High Dam electrification project. The

(89) Harrod, Roy. Policy against inflation 1958 p.233
 Quoted by R. Edwards The finance of electricity supply, Lloyds Bank Review 1960 p.104

(90) Ibid. p.10

The estimated total capital required for financing this project, from 1961/62 to 1970/71 is £E107.5 million out of which £E63.55 million is foreign capital and £E43.95 domestic. Table 19 shows the sums required each year with the classification of capital needed for generation and transmission plants.

The second important feature is the high proportion of self-financing. The analysis of figures, shown in the Budgets of the four main electricity authorities (Table 20), indicates that the total expenditure is £E35.9 out of which £E16.2 is investment on new projects. The financial resources, £E18.6 as self finance, £E14.3 as loans and £E3.0 defined as other sources. This shows that self finance is a little more than 50%. The high ratio of self-financing here is due to the relatively high average electricity rates per consumer. From some of the countries investigated by the U.N., Table 21 shows that average prices per consumer in Egypt is higher than in any other country investigated, except Turkey. The average price is confined to Cairo and Alexandria, the two main urban areas in the country.(91)

(91) United Nations. The development of manufacturing industry in Egypt, Israel and Turkey, New York 1958.

TABLE 19.

ASWAN HIGH-DAM ELECTRIFICATION PROJECT

ESTIMATES OF INVESTMENT COSTS (MILLION POUNDS)

Year	Total	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70	1970/71
b. Power generation											
domestic	23.95	0.80	1.10	2.50	4.00	3.50	3.50	2.75	2.30	2.00	1.50
foreign	33.55	0.20	0.40	1.00	1.50	4.50	5.50	6.25	6.70	6.00	1.50
total	57.5	1.00	1.50	3.50	5.50	8.00	9.00	9.00	9.00	8.00	3.00
c. Power transmission											
domestic	20.0	-	0.40	1.40	3.80	4.50	4.20	4.20	1.50	-	-
foreign	30.0	-	0.10	2.10	5.70	7.00	6.30	6.30	2.50	-	-
total	50.0	-	0.50	3.50	9.50	11.50	10.50	10.50	4.00	-	-
Total	107.5	1.00	2.00	7.00	15.00	19.50	19.50	19.50	13.00	8.00	3.00

TABLE 20.

BUDGET FOR 1962/63 (IN POUNDS).

Authority	C.E.G.A.	H.E.P.D.	Electricity commission & technical bureau	A.E.G.O.	Total Electricity Authorities
<u>Expenditures</u>					
Operating charges					
Salaries & wages	1,833,000	257,000	-	780,000	(
Fuel, oil & lubricates	3,750,000	10,000	-	(2,100,000	(10,296,200
Other operating charges	1,475,500	90,000	-	((
Interest on Govt. loans	447,439) -	-		
Repayment of Govt. loans	1,347,725)677,000	-	-	(-
Depreciation	1,107,356)		417,180	(9,472,435
Other expenditure & taxes	1,300,000)			(
Excess revenue	1,657,180	1,646,035	-	872,520	(
Investment on New projects	3,043,218	658,000	11,692,000	817,000	16,210,218
Total	15,961,418	3,338,035	11,692,000	4,987,400	35,978,853
<u>Revenue</u>					
Self revenues	12,805,000	1,998,200	-	3,838,500	18,641,700
Loans	1,935,862	658,000	11,692,000	-	14,285,862
Other sources	1,220,556	681,835	-	1,148,900	3,051,291
Total	15,961,418	3,338,035	11,692,000	4,987,400	35,978,835

TABLE 21.
AVERAGE RATES FOR ELECTRICITY
CENTS PER KILOWATT HOUR.

Country and year	Average all users	Average industry
Egypt 1954 (b)	4.3	1.3
Israel 1956	1.9	1.4
Turkey 1952 (c)	5.0	4.7
France 1952	2.3	1.6 to 2.0
Italy 1952	1.4	0.6
Sweden 1952	0.6	0.5
Switzerland 1952	1.4	0.9
U.K. 1952	1.5	1.1
U.S.A. 1951	1.8	0.8

(b) including taxes amounting to 8% and 44% of the rate for non-industrial use in Cairo and Alexandria respectively.

(c) excluding taxes amounting to 40-50% of the rates for electricity used for lighting and 30-40% of the rates for electricity used in industry.
Data covers only Istanbul 1954

The table also shows that average charges to industry are much lower than Turkey and little lower than France. Compared with the U.K. charges to industry are a little higher. The relatively lower charges to industry in Egypt is due to the policy of encouraging new industries in the county to be more productive. Average prices per consumer in rural areas are expected to be much higher than those in urban areas, had rural consumers been connected.

Rural electrification.

This discussion may lead us to one of the most important problems of financial planning, i.e. financial rural electrification schemes.

The rural market for electricity has been for many years untapped. The reason is that rural consumers are farther from the main distributive network and more scattered than urban consumers and it therefore costs more to connect and to supply them.

The problem of financing rural consumers in Britain is less difficult than in Egypt. If the difficulty in Britain is that that capital involved cannot be subjected to the normal test of return on investment, the difficulty in Egypt is the lack of capital required. To overcome the problem in Britain, and to encourage the Area Electricity Boards to promote rural electrification as a national duty, various theoretical methods of financing could be adopted. For example, to charge the rural consumers concerned all costs of connecting them. But apparently this method cannot be applied because the consumers cannot afford to pay the high costs involved. Or the Area Board concerned, where rural consumers are, would carry out the project. This

method can be applied if the Board concerned have a special incentive, for instance, through a reduction in the bulk supply tariff. But this method would involve a complex system of accounting a non-uniform bulk supply tariff. This method may also burden the consumers of this particular Area when costs of connection cannot be recovered through the said incentive. The method which has already been adopted is that the industry as a whole carries this burden, by establishing a central fund in which the whole of the consumers contributes. This method was criticised by the Herbert Report. The Report stated that if Parliament decides in the national interest that the Boards should pursue policies and incur expenditure which after normal economic or commercial tests, would be avoided or deferred, the cost of such policies should fall on the national Exchequer rather than on the consumer of electricity.(92) But also subsidisation by this method, through the Exchequer, would raise the criticism that the industry is inefficient and burdening the taxpayer.

It seems to be a practical method in Britain, if rural consumers are to be connected, that the

(92) Op.Cit. para 367

Government should subsidise these consumers and also for the consumers concerned to contribute in the costs of their connection.(93)

In Egypt the problem is more difficult, as the number of consumers is much smaller in Egypt than in Britain and the growth of load is also slow because of the relatively low standard of living. Yet it is inevitable that unless electricity is extended to rural areas, the standard of living cannot be raised and, if conventional methods for financing are applied, rural electrification cannot be accomplished. Thus it is essential to find out a suitable method to finance rural electrification schemes.

Methods which may be suggested in this case are:

first, to demand from consumers concerned individually or collectively a loan, at a low rate of interest, to cover a portion of the capital required. If consumers, as expected, cannot be made to pay, the only alternative is a subsidy.

second, a subsidy may take several forms

(a) by shifting the burden onto the urban consumers,

(93) Edwards, R. The influence of the nationalised industries, Electricity Council 1960 p.18

i.e. to raise prices charged to these consumers above the cost of supplying them. Making a surplus this way will contribute in financing rural projects. The success of such a method depends mainly on the standard of the existing tariff. If it is low enough, then the greater the increase in rate the greater the proportion of the capital to be devoted to rural electrification. But it is necessary that consumers who accept this increase in tariffs must be convinced that rural electrification will pay its way after a period of time. And as the scheme will become remunerative, there will be a benefit from this development which would accrue to the whole consumers in the form of a reduction of tariffs.

The application of this method in Egypt must be ruled out because electricity tariffs are already high in comparison with other countries as we have seen from Table 21.

- (b) The other form of subsidising is that the Government will foot the bill. By this the burden will be on the general tax-payer. Support for this method comes from the fact

that rural electrification is essential for raising the standard of living by increasing the productivity of these areas. As the burden of capital required cannot be carried by rural consumers alone, or even by the whole industry, as mentioned above, there is no other alternative but to transfer the burden to the general taxpayer. If indirect economic benefits will accrue to the whole community, therefore subsidy by this method is justifiable. To adopt this method, it should be borne in mind that subsidy for rural electrification must compete with other economic projects requiring a similar subsidy. In such circumstances the Government must be sure that economic benefits, from rural electrification, will accrue from various uses of electricity other than for mere lighting. The possible agricultural projects which can be economically carried out have been mentioned earlier in this chapter.(94)

(94) See Agricultural consumption p. 176

Conclusion.

It is clear from the discussion of financial planning that public enterprises and particularly the electricity supply industry require a large capital investment. To raise this capital, in Britain there are mainly three methods available: from the market-guaranteed by the Government or not, by Exchequer Advances and by ploughing back the industry's surpluses.

From the various views on borrowing it is concluded that nationalised industries should not compete with other industries in the market, because of the monopolistic position the nationalised industries hold and also because they have a low ratio of self-financing. Monopolistic position enables the nationalised industry to raise rate of interest but this will be passed on to the consumer. The low ratio of self-financing helps the nationalised industry to draw a large part of capital from the market which the market cannot afford. On the self-financing problem one cannot be dogmatic. The ratio of self-financing should depend on the economic factors embracing the industry, such as the price/cost ratio and the

rate of growth in the industry. In Egyptian public enterprises examples show that some enterprises depend greatly on their surpluses, others require loans for financing their programmes.

In the electricity supply industry it is shown that in Britain financial resources are mainly Exchequer Advances and self-financing. The latter has been increased slightly in its proportion to other sources. In contrast with Britain the Egyptian electricity supply industry depends mainly on two sources: foreign loans and self-financing. The latter provides a higher proportion than in Britain because the average price of electricity supply is much higher in Egypt than in Britain.

The high ratio of self-financing is one of the main factors for implementing rural electrification schemes. It is found that in financing rural programmes in Britain it would be a practical method if consumers contributed towards the cost of connection, with a Government subsidy.

In Egypt it is impossible to burden the rural consumers with more charges. Thus the Government, through the general taxpayer, should be responsible for financing rural electrification schemes.

CHAPTER IV.

INVESTMENT, PRICES AND WAGES POLICIES.

INVESTMENT POLICY.

It has already been mentioned in the previous chapter that all industries examined in both Britain and Egypt which have come under public ownership or have been created as public enterprises require large amounts of capital for financing their investment programmes. The capital invested in these programmes amounts to a considerable proportion of the total investment of the whole country, and a large percentage of this total capital invested in the public sector is required by the electricity supply industry. One single generating plant, particularly hydro or nuclear, may require a very large amount of capital. In Egypt, the High-Dam hydro-electric power station will cost approximately £E100 million. A nuclear power station established in Britain costs between £45 million and £65 million, each excluding the initial fuel charge (about £15 million.) (1)

Because of the large capital involved it is the responsibility of the management to develop and apply systematic investment criteria, aiming to select the most economical method of supplying

(1) Baker, R.J.S. The Management of capital projects
London 1962 p.150

electric power to the ultimate consumer. In other words, a successful investment policy in the electricity supply industry should lead to a reasonable cost per kilowatt hour supplied. The cost per kilowatt differs not only between various means of supplying electricity but also between one country and another with regard to the same method of supply. Therefore it is important to note that a comparison of the cost per kilowatt of alternative means could only be valid for plants operating under similar conditions. As there are wide differences of economic background throughout the world, investment policies may differ widely from country to country. But this does not mean that there are no common factors to be considered in investment decisions. The problem of choice between different sources of generation involves some questions which should be considered in any circumstances.

The problem of choice.

As has been mentioned, the electricity supply industries in both Britain and Egypt have planned to establish several electricity projects to meet the growing demand estimated in the future. These projects include the construction of generation, and

transmission plants.

The question here is on what economic bases it is decided to install these projects. With regard to generation projects, the problem is the choice between different methods of generation, whether conventional thermal, nuclear or hydro generating plants. What makes an investment decision in this respect critical is the large capital required to establish any of these generating devices. The choice of a suitable plant based on cost comparison should result in the most economical plant which produces electricity at a minimum cost per unit. A cost comparison here consists of three categories; fixed charges, fuel costs and operating costs. Within a given capacity, capital costs of a hydro plant are approximately 2.5 to 3 times those of conventional thermal plants. Also capital costs of nuclear power stations are twice as much as those of conventional thermal. Hydro power stations need very large capital in civil engineering works. Nuclear power stations require special equipment of nuclear power reactors, which involves complex engineering construction and the use of special material. There are also direct costs for shielding

against contamination by radiation, in addition to great precision needed in the design, manufacture and construction of the reactor. It should be noted here that fuel costs in nuclear plants are also included in capital costs. It is the present practice of the electricity supply industry in Britain to amortize fuel costs over the life of the reactor.(2)

Another element of fixed charges is depreciation which raises a particular problem in cost comparison between different generating methods. The fact that the life of a hydro plant is nearly twice as long as that of a thermal plant, means that in a cost comparison a life span of two successive thermal plants has to be measured against the life of one hydro. The difficulty in this measurement is the estimate of the second thermal plant, the cost of which, with the advancement of technology, it is not possible to know in advance. In this respect the Mackenzie Report suggests, for an almost correct cost comparison between hydro and two thermal plants, using the component costs

(2) Electricity in Scotland. Report of the Committee on the generation and distribution of electricity in Scotland Cmnd. 1859 November, 1962 para 120

of the most advanced alternative thermal plant that would be installed at the time that the hydro scheme is proposed. (3)

The depreciation factor is difficult to calculate, in nuclear power stations too. Because of incomplete knowledge of technical factors, the life of nuclear plants is uncertain. Estimates vary considerably, for example, in Britain fifteen years life is assumed for the nuclear portion of the plant and thirty years life for the rest of the plant taking an overall figure of twenty years for the whole plant. Other estimates expect twenty years for the nuclear portion and thirty-three and one third years for the conventional portion of the plant. An overall assumption of twenty-five years has been taken into account.(4)

Other costs which should be considered to arrive at a final evaluation of cost per unit are fuel costs and other operating costs. The latter, in fact, do not differ materially between different forms of generation. These are costs of maintenance, repairs, wages and salaries in the generation process.

(3) Ibid. para 115.

(4) United Nations. Economic applications of Atomic Energy, New York 1957 p.9

But fuel costs differ widely between different forms of generation. In conventional thermal power stations fuel costs depend basically on the cost of extracting and processing fuel, the cost of transporting it and the price trend of coal or oil. The whole of these costs represent about two-thirds of the cost of production. In hydro plants there are no fuel costs which have to be set against the heavy capital expenditure. Fuel costs in nuclear plants consist of the replacement of the initial fuel, additional charges for chemical processing and waste disposal less by-products.

Evaluation of these production costs gives an approximate idea of the production cost per unit of electricity. In a comparison of production costs between different sources of generation, they should be adjusted to take into account the difference in the load factor (5) and the loss of benefit deriving from the preference of selecting a particular source rather than another. For example, nuclear power stations are usually designed

(5) The load factor is the ratio of average demand in the year to peak demand. If a power station runs at 120 KW on the average but the demand goes up to 200 KW sometimes during the year it has a load factor of $\frac{120}{200}$ or 60%.

200

to supply a relatively higher load factor than thermal or hydro. It is necessary also to take into account the loss of production from hydro plants if there are not sufficient consuming centres, because generally hydro plants are located in remote areas.

Apart from production costs used as a basis for comparison there are other factors which decision makers have to take into account. These factors may change a decision based only on production costs. Let us first consider some of these factors and then examine a particular case in the Egyptian electricity supply industry.

- (1) Flexibility of economical siting of power stations may affect a decision to select a suitable source of electric power. For example, hydro plants are strictly located where flow of water is available. Exploitation of hydro plants is greatly affected by the distance between consuming centres and the location of the proposed plant; if the site is too remote it is necessary to take into consideration the high costs of transmission lines required. Thus hydro plants are only

economic where sufficient consumption is expected to affect the costs of transmission. Conventional power stations are more flexible than hydro, but this flexibility is influenced by the difference of costs between two factors. One is where location of the power station would be nearer to the consumption load, as in this case costs of transporting fuel are high. The other is where a power station is located near to fuel sources, either coal fields or a harbour of imported fuel, in which case the costs of transmission to consuming centres should be taken into account. Nuclear plants are more flexible in siting than both hydro and conventional thermal, because costs of fuel transporting are not as high as in the conventional thermal. So it may be thought that nuclear plants can be sited in remote areas to save costs of transmission. But the main factor which affects this flexibility is the fact that nuclear plants must supply a heavy load centre which is not likely to be found in rural areas. Nuclear power supply must be continuous. In addition safety conditions may be very expensive.

- (2) Technical progress and the increase of the size of conventional thermal plants have secured large economies of scale resulting in a decrease of consumption of fuel and therefore a decrease in cost per unit.

It is estimated that 'modern thermal stations consume about 2400 calories of fuel per Kilowatt hour produced, compared to the 3500 calorie consumption of new stations in 1935.(6) Modern thermal power stations have resulted in a great decrease of costs of manpower. A modern power station requires one man per 2.5 MW while old stations required at least four men per Megawatt. Moreover, it has been argued that, for example, in France, technical progress in the construction of hydro plants has been offset by the expansion of sites. This means that conventional thermal power stations will strongly compete against hydro plants. But there are some factors which may work against a decision to choose a modern conventional thermal plant. These are:

(a) technical progress occurs also in hydro plants, if sites are not exhausted. In fact,

(6) Boileux, M. Electric Energy, facts, problems and prospects. Nelson, H.R. (Ed.) Marginal cost pricing in practice 1964 p.7.

there are many hydro sites, especially in under-developed countries, which are not yet exploited.

- (b) Modern conventional thermal power stations may require a high capital costs which reduce the traditional advantage of low capital costs.
 - (c) The fact that it is not easy to replace old conventional thermal plants by modern thermal ones. An investment in the replacement of old plants may not be worthwhile.(7)
- (3) A decision to choose a particular source of power should be based on the potentialities of the country. In some countries, where hydro power sources are not available, a choice is limited between conventional thermal stations or an alternative nuclear one. On the other hand some countries, which have unexploited hydro sites, have a wider range of choice between the three sources of power. Potentialities also may include the necessary equipment for construction, fuel and machinery. This factor may be very important in a choice between nuclear power plants and two other forms. In

(7) Brown, F.H.S., & Edwards, R.S. The replacement of obsolescent plant, *Economica*, Vol. 28 1961 p.297

Most underdeveloped countries equipment and skills necessary for nuclear plants are not available. Assuming at the same time that hydro sites are available; a choice between the two forms must take into account the cost of importation of machinery and skill for the establishing of nuclear plants. Such costs may sway the direction in favour of hydro although it is known that capital costs of hydro plants are greater than nuclear over a similar capacity.

- (4). A factor which is closely linked with the potentialities of the country is the reserve of foreign exchange which may be required. It may be argued that the scarcity of foreign exchange in underdeveloped countries makes investment in hydro and particularly in nuclear plants unattractive. Since it is true that nuclear plants require highly specialised equipment and skill produced only in a few countries, installation of nuclear power stations needs a considerable amount of imported equipment using foreign exchange. But hydro plants involve a large proportion of costs in civil

engineering work which could be supplied by national producers and consequently carried out with relatively little foreign exchange. Conventional thermal power stations are in a more difficult position in this respect, because advanced power stations at the present time produced in highly industrialised countries require heavy foreign exchange. What makes the situation more difficult is the importation of fuel, if it is not available from national resources. These costs are, of course, recurring. The result of considering this factor will put hydro plants in a favourable position as against the two other sources of electric power.

- (5) Amenity and landscape value may affect the decision of choice. The importance of this factor arises from the fact that not to spoil the beauty of an area may cost a great amount of capital, which should be added to the total costs of the scheme. For instance if transmission lines between thermal power stations and consuming centres have to be underground for amenity purposes, this would

result in a high cost per unit supplied from the thermal station, and consequently lessen the advantage of low capital costs. But a hydro plant designed to be located in an area of great landscape value may not compete favourably with an alternative thermal station.

From the above examination of factors affecting the choice of particular type of generation, two questions arise: for an equal output, can the nuclear power method compete economically with conventional thermal or hydro, and would hydro power generation be preferable to conventional thermal? Let us try to answer these two questions within the particular circumstances of the Egyptian economy.

With regard to the first question, one could argue that nuclear power projects in Egypt are uneconomic. The reasons are, first, the high capital required for the installation of nuclear plants in comparison with conventional thermal ones, involving a high proportion of foreign capital. Secondly, nuclear power plants can only be economic in a highly efficient grid system in order to supply the base load. This is not available in Egypt at the present time. Thirdly, the ability of nuclear power to

compete with other sources depends to a significant extent on intergovernmental agreements on financial and fuel provisions. Fourthly, the expected low fuel cost per unit in nuclear power is not yet known by experience. Fifthly, if the capital required to establish nuclear power stations is a little less than that of hydro in a given capacity, why should we not divert this capital to hydro, plants, considering its advantages, especially when it is known that there are many sites either on the River Nile or other national water resources which are not yet exploited.

On the other hand, there are some reasons in favour of establishing nuclear power stations. If oil and other fuels are still imported for conventional power stations, nuclear methods of generation may compete economically, because in the former case fuel costs are recurring. Nuclear power stations are more flexible in location. Also countries may have a desire to hold nuclear knowledge.

An evaluation of the advantages and disadvantages in terms of figures may make it difficult to give a precise answer. But if we consider the available knowledge, nuclear power stations should be the last to be established.

Arriving at this conclusion it is still necessary to consider whether hydro power stations would be preferable to an equivalent conventional thermal type. An example of this problem in Egypt is the decision taken to install the High-Dam power station or establishing instead conventional thermal power stations, with similar capacity, throughout the country. H. Sultan claimed (8) that an equivalent conventional thermal power station would be economically better than the High-Dam hydro power station. To arrive at this conclusion, H. Sultan assumes two methods of transmitting electricity from the High-Dam project. The first is where all generated energy will be transmitted to Cairo, the main consuming centre. In this case it is calculated that the cost of the hydro-electric station and the transmission lines will be about £E97 million, while the establishing of a conventional thermal power station nearer to the load centre in Cairo will cost only £E43 million, producing the same energy. The other method assumes that a proportion of the generated energy from the High-Dam hydro-electric station will be consumed in 'Minia and Assuit' through

(8) Sultan Hamed. High Dam power station.

Memorandum 84 of the National planning committee
Dec. 7th 1958.

two transformer power stations in those large cities in Upper Egypt. In this case the total costs of the hydro-station, two transformer power stations and the transmission lines to Cairo will cost £E100 million. Instead H. Sultan suggests that two thermal power stations could be established in the two mentioned cities in addition to the main thermal one in Cairo. All these will cost only £E48 million. By adopting the second method the difference between the two costs, (of the High-Dam power station and conventional thermal) would amount to £E52 million. Also an advantage will come from the saving of foreign exchange required. It is estimated that foreign exchange required for the High-Dam hydro project is approximately £E6.771 million annually during the construction period of fifteen years. For the alternative thermal power stations the required foreign exchange is approximately £E3.335 million annually during a construction period of 5 years. Saving of foreign currency could also be achieved if fuel for the suggested thermal plants could be supplied from national resources. H. Sultan's study suggests that the establishment of thermal power plants as an alternative to the

High-Dam hydro-electric project, is economically preferable. Saving, particularly foreign currency, would lessen to a greater extent the heavy burden on the Balance of Payment.

Let us see how far this conclusion is justified. Are the assumptions right? If they are right what are the benefits of the High-Dam hydro-electric project?

With regard to the first question, the main error made in the analysis is the assumption that the hydro project has a life of 40 years against a life of 31 years for the conventional thermal plant. However, it has been suggested by the Mackenzie Report that in a correct comparison between the two projects it is necessary to take into account two successive thermal plants against one hydro plant. And even if the former assumption is right and the Mackenzie Report is wrong, the analysis ignores the life of the hydro-plant, when calculating fuel charges of thermal plants.

Also it has not been considered in the analysis that the costs of modern thermal plants are expected to be high and the trend in the price of fuel is upward.

The other question is, what are the economic benefits of the High-Dam hydro electric project?

- (1) It has been mentioned that the main advantage of a hydro electric station is that it consumes no fuel, which offsets the high capital costs involved. Thus in comparison between the High-Dam hydro electric project and an alternative thermal plant it is important to consider the high fuel charges involved in the thermal case, especially when it is known that if fuel will not be supplied from national resources, this will cost about £E7 million foreign currency annually. This is already a heavy burden on the Balance of Payments. It has been mentioned that the advantage of having no fuel charges in hydro plants would be offset by the exhaustion of sites. In Egypt hydro sites are not yet exhausted. Long-term planning shows that hydro sites can be utilised up to 1985. In addition the construction of the grid system in 1968 will permit a systematic use of surplus water which will result in economies in the use of fuel of other conventional thermal power stations.

- (2) The main load centre in Egypt is Cairo and its suburbs, which is already exhausted by the location of large numbers of thermal plants. Consequently the problems of air pollution and amenity will be more difficult to solve. The High-Dam project transmitting electricity through 500 KW transmission lines would need only one transformer power station sited near Cairo for supplying electricity requirements in the area.(9)
- (3) One of the most important advantages of the hydro project is the security of national supply. It has been mentioned that nuclear plants as well as modern conventional thermal plants require a large proportion of foreign capital and skill than hydro.
- (4) Not much less important is the fact that hydro projects contribute effectively in reducing the burden of unemployment. For instance the High-Dam project employs 17000 men for a long period of construction than alternative thermal while the period of construction of the High-Dam hydro electric project is 15 years. This already
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- (9) See Maps 3 & 4.

has given the Aswan area, where the Dam is located, some economic prosperity.

- (5) H. Sultan argued that the economical advantages of the High-Dam project would only have significant results if a group of industries were to be established in the Aswan area, resulting in a saving of £E32 million of transmission lines to Cairo. This suggestion may be criticised as it would result in an uneconomical location of industries. The fact that the Aswan area is too remote from the national consuming centres and exporting harbours would result in additional costs making production expensive.
- (6) H. Sultan also argued that investment in hydro plants has a rate of return amounting to 14%. This is considered low compared with a rate of return of 20% which is considered by the International Bank of Construction as a fair return on investment in under-developed countries. But regarding the urgent needs of electricity supply in Egypt to assist in economic and social planning, 14% rate of return is favourable. Having all these advantages in mind a decision to choose between the High-Dam hydro electric project and an alternative conventional thermal plant, would be significantly in favour of the hydro project.

Conclusion.

One of the aims of investment policy in the electricity supply industry is to select the best method of generation with the minimum cost per unit supplied. The problem of choice should be dealt with according to the economic position of the country. For example, it has been proved that nuclear generation in Egypt at the present time as scheduled in the first 5-year plan is uneconomic, because the existing hydro sites are not yet exhausted. But there are also some general considerations which have to be taken into account in any country. The example given about whether to carry out the High-Dam hydro- electric project or to establish instead alternative conventional thermal plants show that some writers advocate the latter procedure. The author's opinion, after giving the available evidence, is that the High-Dam hydro-project assures the utilisation of available national resources as well as being a cheaper method of supply.

Price Policy.

In the previous section an examination of the economic factors on which a choice of the suitable generating plant has been made. In a given example within certain conditions we arrived at a conclusion that hydro plants may produce electricity units with lower costs than the two other types. But in other circumstances different conclusions may be reached. Whatever the choice will be, the main target in the most economical choice is supplying electricity to the ultimate consumer with the minimum cost and consequently to charge consumers with a reasonable price. In practice the minimum cost of supply is not the only basis on which consumers are charged for their consumption. There are also other factors to be taken into account in the public interest. For these reasons the price policy in the electricity supply industry and all public utilities involve some problems different from those which face private enterprises. By the nature of public enterprises, they are either operated by agencies of the Government or regulated by public laws with a certain degree of ministerial intervention in the public interest. At the same

time it is considered that they work as commercial undertakings. Thus one could argue that pricing policies in public enterprises should be considered to take into account two aims: first, the sound economic basis on which to fix the price which, in this section, will be examined within the boundaries of monopolistic or semi-monopolistic power, which they enjoy, and second, the public interest following the official recommendations to pursue a desirable policy, instead of relying merely on their economic position.

In British public enterprises, these two aims are clearly stated in the White Paper 'The financial and Economic obligation of the Nationalised Industries' published in 1961.(10) The Paper describes the Government's general policy in relation to nationalised industries as, on the one hand, to secure that the industries are organised and administered efficiently and economically in order to carry out their responsibilities and they are thus enabled to make the maximum contribution towards the economic well-being of the country as a whole. On the other hand, although the industries have

(10) Cmnd 1337 1961 para 2

obligations of a national and non-commercial kind, they are not and ought not to be regarded as social services absolved from economic and commercial justification. The latter issue is, in fact, the main problem in finding an appropriate price policy to be followed by public enterprises. It is thought that any attempt to consider these industries as merely of commercial kind would be wrong, because they are regulated by public Acts, on the other hand they cannot be considered as social services because there is nothing to prevent them from operating at a surplus nor is there any legal limit to such a surplus.(11) Hence there is a practical difficulty in finding a universal price policy in public enterprises. For example, in the electricity supply industry the tariffs actually applied vary from one country and even from one Area to another as there is no principle commonly accepted in all countries on which it is possible to determine the level of rate applicable to each category of consumers and to each type of supply.(12)

(11) Robson, W. Nationalised industry and public ownership p.66

(12) O.E.E.C. The theory of marginal cost and electricity rates, Paris 1958 para 2.

However, there have been several attempts to find out the most suitable method on which prices should be determined. For example, in British public enterprises, there is a statutory break-even method. The Boards of the nationalised industries must not make profits in the normally accepted sense. But they rather seek to balance their revenues and their outgoings on an average of good and bad years. Thus prices should be equal to their costs, neither more nor less. It is found in all nationalisation Acts, that they are required to ensure that their revenue is not to be less than sufficient taking one year with another, to meet outgoings properly chargeable to revenue. The Boards are not obliged to cover their outgoings every year but at least sufficient to cover deficits on revenue accounted over a five-year period. The electricity supply industry in Britain applies this principle in addition that each Area Board is required individually to satisfy this legislation.(13) The merit of this method if 'it is pushed to its logical conclusion, the prices charged for each unit or category of goods

(13) Edwards, R., & Townsend, H. Business enterprise
London 1958 p.565.

or services should always correspond to their relative costs.'(14)

The main criticism of this method in the case of electricity is that prices are sensitive to the elasticity of demand. Most electricity users have direct substitutes. In commercial and industrial consumption and some domestic, demand is vulnerable to competition from other sources of power, such as gas, oil and even coal. For example, electricity meets competition from coal, coke, gas and oil for heating, gas and oil for lighting, oil, gas, steam and water for power and oil and steam for traction. The varying availability and suitability of the substitutes affects the elasticity of demand which prevails in each market. Electricity has a relatively inelastic demand for lighting. On the other hand for heating, gas and solid fuels have a relative advantage and the demand for electricity is more elastic. It has been noted that nationalised industries are as vulnerable to competition as much of private industry, so that there is no reason to suppose that electricity in most of its uses has

(14) Robson, W. Nationalised industry and public ownership p.291

much monopoly power. Any considerable change in electricity tariffs would lead to its replacement by other fuel.(15) In other words, if electricity tariffs are so high as to divert consumers to other substitutes, then the industry will not be able to cover its costs from revenue.

If we consider the electricity supply industry as a social service which should be supplied to the community to achieve social ends, a method of determining a price could be set a price as low as possible. The serious criticism of this method is that it leads to mis-allocation of resources, because of the under-pricing of the product.

The most controversial issue in fixing electricity rates is whether to relate them to the marginal cost or the average cost of producing electricity units.

Marginal cost is the cost of producing additional supplies and marginal cost pricing aims at ensuring that the prices charged should correspond to the cost of additional supply including new installations which have to be established in the

(15) Foster, C.D. The cost of financing the nationalised industries, Institute of Statistics, Oxford Bulletin, Vol. 22, 1960 p.94.

industry. Thus electricity rates should be fixed on the basis that each KWh should be sold at the cost of the power which would be produced by any additional plant installed including transmission and distribution. On the other hand, average cost pricing is to equate price charged with the cost of producing the average unit of output including not only variable costs but also fixed costs.

The advocates of the marginal cost theory claim that it is the best method of pricing in the electricity supply industry. Electricity undertakings invest a large capital, thus they are operating under conditions of decreasing average costs. Under these conditions the optimum output with marginal cost pricing is greater than the optimum output under average cost pricing. This difference would result in additional investment and welfare optimum could be attained.(16) The explanation is that because fixed costs in electricity undertakings are divided from the very start among only a few units of service, so that as output increases the same or nearly the same total of fixed costs are spread over more units of output

(16) Harbeson, D.W. A critique of marginal cost pricing, Land Economics Feb. 1955 p.55.

and the average costs decrease. This is clear when off-peak services expand, as no additional investment in the basic plant capacity is required. As output expands towards the optimum, fixed costs decline. However, average costs do not always decrease, for instance, if the utilisation of the existing plant is increasing too fast, i.e. if demand at a certain time increases too fast, the existing capacity would not be sufficient to meet demand. Consequently the industry has to use less efficient plants of generation, according to the merit of order principle. Hence a situation of increasing costs prevails. This can be illustrated by the relation between three curves showing average total costs, average variable costs and short period marginal costs. When the average total costs and average variable costs slope downward the marginal cost curve is below them and decreasing more rapidly than they are. When the average variable costs are constant, the marginal cost and average variable costs curves intersect. And when the average total cost and average variable cost curves slope upward, the marginal cost curve is above them.(17) Another

(17) Troxel, E. Economics of public utilities New York 1947 p.447.

reason for increasing average costs is the exhaustion of hydro electric sites and the tendency towards decreasing returns which appears in thermal electricity due to the problem of air pollution. But this factor is offset by the increasing returns in distribution.(18) Moreover, it is argued that all costs are marginal in the long run, so that marginal cost pricing and average cost pricing are one and the same.(19) Thus the definition of marginal cost ignores the time element, whereas the rate of growth over time of an industry undoubtedly affects its costs.

Now assuming that the electricity supply is working under decreasing average costs in the short run, how would marginal cost pricing result in additional investment?

It has been argued that if electricity rates are to be fixed on the average cost principle, that is, by simply dividing total costs by total kilowatt hours, such a process would ignore special costs due

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- (18) Boiteux, M. *Electric energy, facts, problems and prospects.*, Nelson J.R. (ed.) *Marginal Cost pricing in practise.* London 1964 p.25
- (19) Little, J.M.D. *A critique of welfare economics,* London 1958, p.156

directly to particular classes of consumers. Also it ignores the difference in rate level that can be effectively applied to stimulate utilisation. Domestic and small commercial consumers usually impose relatively high costs compared to other commercial and industrial consumers. An equal rate per KWh for all purposes and quantities of consumption would not be a good system of rates.(20) In this context the Herbert report says that the electricity supply industry should have one duty, that is to supply electricity to those who will meet the costs of it.(21) Professor R. Edwards supporting this view says 'if the price charged by a nationalised industry is not increased in response to a cost increase the surplus will be reduced and even if the capital investment is not reduced because the industry is allowed to borrow more from the Government, the Government must either borrow more or increase taxation, so the pressures are reduced by a diversion of resources from other borrowers of taxpayers.(22)

(20) Bauer, F., & Castello, P. Public organisation of electric power New York 1949 p.216.

(21) Op.Cit. para 567.

(22) Edwards, R. The influence of the nationalised industries, Public Administration December, 1960 p.46.

If each consumer should be made to pay for the kilowatt hour supplied, the exact cost involved in the production of that kilowatt hour, it would certainly be an ideal tariff in the economic sense. But it may be unrealistic, because it is known that the electricity supply industry is an expanding industry facing a demand increase which has to be met by additional plants. The cost of this machinery varies from time to time, with a tendency to increase. A considerable proportion of production costs are depreciation and interest charges. This means that when the cost of new installation is high and tariffs are to be based on marginal cost, this would result in burdening new consumers with higher charges to a greater extent than the existing consumers even though they are within one category. Average cost pricing in this context appears to be fair.

The preceding argument is only one point out of many involved in the controversy of marginal cost and average cost pricing. It shows how difficult it is to follow either of the two theories. This is clear from the fact that 'The Committee on national policy for the use of Fuel and Power Resources',

were equally divided on the subject.(23)

If we want to adopt a practical method for pricing in the electricity supply industry, we must take into consideration the special features of the industry. First, in contrast with many industries electricity costs vary not merely with the amount of output supplied but also with the time of day, month and year at which it is supplied and to whom it is supplied. The wide variation of costs incurred at different times is due to variation in demand, as could be seen in any load curve for a day, season or year.

This feature raises the problem of off-peak pricing. To increase demand in peak periods is not always desirable since it requires additional plants used only for a few hours in a day or at certain times during the year.

The question here is, will the price be equal to the marginal cost or the average cost of supply at peak periods? There is an opinion which may be suitable to be adopted, if it proves after further studies that it can work well.

(23) Cmnd 8647 1952 para 54.

The opinion is, that since extra costs are incurred by the demand of peak users, thus peak tariffs must be higher than off-peak tariffs. At peak hours tariffs should include in addition to the marginal cost a charge for the fixed costs of the plant.(24) On the other hand at off-peak periods the price should be equal to the marginal cost of producing and delivering electricity.

Another feature of the electricity supply industry is the fact that electricity cannot be stored at least for a long time or resold, by the consumer. Also the fact that the consumer cannot easily transfer his demand to another producer makes it possible for the electricity industry to practice discrimination between different classes of consumers. Because of the importance of discrimination in price policy of the electricity industry it is necessary to examine it in more detail.

Price discrimination.

While discriminative electricity tariffs between classes of consumption may be acceptable,

(24) Harberger, D., & Andretta, N. A note on the economic principle of electricity pricing. Applied economic papers, March 1963 p.38.

discrimination between consumers for use of electricity for the same purpose would not be tolerated. To explain this statement we have to know the economic reasons why electricity authorities discriminate between classes of consumers. The cost of service is one economic reason for discrimination. Electricity authorities incur sometimes more costs in serving one class of consumer than another. For example, the cost of serving large industrial consumers is lower than for small consumers in relation to their consumption. Also consumers who have large off-peak demand are less costly than peak users, because in the former case no additional plant is required. This is a sound reason for differentiation between off-peak tariffs and peak tariffs. Another example is that industrial consumers who have a steady demand over a long time could be supplied with little excess capacity, or consumers who have a large demand at one point of supply will save distribution and administrative costs. These classes should be charged with promotional tariffs.(25)

Elasticity of demand is another reason for price discrimination. As a rule industrial and

(25) See Retail tariffs below p. 334

large commercial consumers have more elastic demand than domestic consumers. The former classes can turn to other sources of power if electricity rates are not low enough to compete, or they may find that it is more economical for them to install their own generating plants. It has been mentioned earlier in this section that domestic consumers have an elastic demand for several uses other than lighting. But it should be noted that demand elasticity of domestic consumers cannot be very high. A consumer may think more about the price and quality of the electric appliance than about electricity prices.

Thus a tariff structure may take into account these differences in elasticity of demand by charging lower rates to industrial and large commercial consumers and relatively higher rates to domestic consumers.

Price discrimination based on the elasticity of demand can stimulate additional investment and an expansion of output. For example, a price reduction for consumers of less elastic demand will lead to more consumption, as long as the demand is not perfectly inelastic. Additional investment can be achieved by dividing consumption into layers each

of which has a different running charge equal to the marginal cost, which the consumers are willing to pay. This is the idea of the block tariff which attracts people who do not want to be committed to periodical payment without relation to actual consumption and want to secure quantity discount.

While all these are economic reasons for discrimination, it is socially undesirable to charge consumers with different rates. Moreover consumers who pay high prices will certainly feel that it is a wrong price policy. Thus, as it has been argued, if a public enterprise is working on a non-profit making basis, benefits from discrimination would not accrue to the monopolist, but to some section of the consumers. In this case it would be desirable for the electricity supply industry to minimise discrimination as far as possible. And if 'it has to discriminate, it should do so only at the request, or with the sanction of the state. Otherwise the monopoly would arrogate to itself the right to tax or subsidize certain members of the community in a purely arbitrary fashion'.(26)

(26) Gabriel Dessus. The general principles of rate fixing in public utilities. Nelson, (Ed.)
Op.Cit. p.37

Price discrimination according to costs of supply complicate the question of rural electrification. There is no doubt that supplying rural consumers for farming and other purposes is of great importance to the national economy. On the other hand it would be impossible for those consumers to pay the cost of supplying them. The Herbert Report observes that the large numbers of new connections has involved the Electricity Boards in heavy capital expenditure, much of which is not initially economic by reference to the expected revenue from the new consumers' payment for electricity. This is especially the case in rural areas where there are fewer consumers per mile of line and where the individual service connections are usually longer than in the towns.(27)

To conclude, it may be stated that although price discrimination is economically justified, it may bring some social problems. A reasonable policy in this respect could be based on economic principles i.e. prices should be related as far as possible to costs of supply, as well as state regulations to overcome these difficulties.

(27) *Op.Cit.* para 151.

Uniform price.

If discrimination does not prove to be an entirely correct method, then an alternative is a uniform tariff. But this is not an easy substitute. Differences in costs among areas persist under any system and they will inevitably remain. Thus uniform rates charged in all areas would mean that some consumers are subsidising others. It may also look unfair. A rate which looks comparatively low may in fact be excessive while a much higher one may be justified. For example, an Electricity Area Board in Britain which enjoys a large demand for bulk supply can charge a much lower average price than one without this advantage. The old British Electricity Authority in its first report states that uniformity of charges for each class of consumer is neither practicable nor desirable and that it cannot be of uniform benefit to all consumers.(28)

The Electricity Act of 1947 (29) laid upon the Area Boards the duty of promoting the simplification and standardisation of methods of charge for supplies of electricity. The second report of the B.E.A.

(28) B.E.A., Annual Report and Accounts, First Report 1948 para 362.

(29) Op.Cit. Section 6.

emphasised this principle by reporting that the need for such simplification is clear and the object of the Authority and Boards is to replace the multiplicity of forms of tariffs and of money charges by a series of standard tariffs, which while giving sufficient flexibility to serve the best interests of consumers, will be comparatively few in number and equitable to all classes of consumers.(30)

The question here is, whether it is nationally desirable that consumers in low cost areas, mainly urban, should enjoy the full advantage of lower tariffs whereas consumers in high cost areas, mainly rural, should carry the full costs of their supply.

But is a uniform tariff equitable? It has been argued that though a uniform tariff appears to be justified as a national policy, it is in effect discriminatory in itself. If electricity is supplied to remote districts, it costs more than to supply districts close to generation. A uniform tariff will practically discriminate against consumers who live close to generating plants.(31)

(30) Op.Cit. para 214.

(31) Weiss, L.W. Economics and American industry
1962 p.246.

One could argue, that according to the practical difficulty of calculating the costs of supply to different regions, assuming they are in the same area, a uniform tariff, charged to consumers with homogenous demand, is not discriminatory.

Knowing the difficulty in adopting a practical method for pricing policies, it is finally the aim to illustrate the tariff structure in both Britain and Egypt.

In Britain electricity tariffs may be examined within two categories: the bulk supply tariff and retail tariffs. The structure and the forms of tariffs to be adopted involve some problems, particularly related to the characteristics of the electricity supply industry, for instance, peak and off-peak tariffs and seasonal tariffs. The features of the electricity supply industry also impose the possibility of changes of tariff structure to satisfy the new conditions. Examples are changes in bulk supply tariff in Britain, discussed below, and the conversion from multiplicity to standardisation of retail tariffs to achieve social equality. On the whole, as mentioned, a tariff should not only be fair to achieve social equality, but must also be formulated

on an economic basis to ensure that the demand is not unduly stimulated or depressed by undercharging or over-charging a particular class of consumers.

The Bulk supply tariff in Britain.

The bulk supply tariff is a wholesale tariff charged by the G.E.G.B. to the Area Boards for their demands for electricity. The composition of this tariff is (a) fixed charge related to the maximum KW demand made on the system by Area Boards and (b) running charge related to the number of units consumed by the Area Board. The fixed charge has to cover the C.E.G.B.'s capital charges and is related to fixed costs. The running charge has to cover mainly fuel costs and other running costs. The design of this tariff is made by the Generating Board with consultation with the Electricity Council in such a way to allow the Generating Board to collect from Area Boards the whole costs of generation and transmission. These costs should include depreciation and a surplus to enable the Generating Board to finance a reasonable proportion of its capital expenditure.(32) Since nationalisation of

(32) Robert, K. The supply industry's perspective. Electricity Council 1961 p.13.

the electricity supply industry in Britain the assessment of the Bulk supply tariff has been changed several times. For example, the 1947 Act permitted the Central Authority to fix different supply tariffs for different Area Boards to take into account the variation of prices of coal between different areas. The trend towards standardisation of the tariff, after that, was criticised on the grounds that this would alter the economic position of the Area Boards to compete with other sources of power. A solution to this problem was introduced in April 1950 (33) by which the bulk supply tariff would be adjusted by a fuel clause to take into account the cost of fuel in the areas of supply.

The most important change in the bulk supply tariff, which resulted in the present method, occurred in 1962-63. Until this year the charges have been distributed between Area Board proportionally to their individual peak demands regardless of when they occurred. By this method, if an Area Board has a local spell of severe weather during off-peak times when the system is not fully loaded, the result will be a gain to the Generating Board and will cost the

(33) Electrical Review March 1950 p.584.

Area Board an unexpected loss.(34) This is a result of the fact that Area Boards charge consumers a low off-peak tariff where the demand is greater in this severe cold spell at the time when the Generating Board charges the Area Boards on peak demands with a high tariff. Under the new method each Area Board bears a fixed charge according to the average of their individual contribution to the half hour of national peak demand before and to the half hour after 31st December in each year. Accordingly the effects of local weather would be lessened and the Area Boards could modify the structure and content of their own retail tariff to reflect the costs of the Area Boards supply. A second important feature in the revised tariff of 1962-63 is the differentiation between day and night rates. Between 11 p.m. and 7 a.m. the difference is to be 20% less than for units bought by the Area Boards during the day. This is an important step to encourage Area Boards to offer cheap tariffs at off-peak times and restrict their demands at the time of the national peak. It encourages, as well, the development of night load and improves the utilization of generating

(34) Edwards, R. Planning for expansion p.35 and Meek, D.L. The bulk supply tariff for electricity, Oxford Economic papers July 1963 p.112.

plants. It is obvious that the cost of producing power is lower per unit at night than it is during the day because the higher the demand the higher the proportion of high cost plant that it is running.

It has been argued that the present bulk supply tariff is 'highly subtle and complex document, and the full meaning of a number of its provisions cannot be grasped at a casual reading.'(35) On the other hand, Professor Edwards states 'the bulky supply tariff is one of the biggest factors influencing the Area Boards' planning and their commercial policies and pricing practices. It allocates responsibility for more than two-thirds of all the industry's costs. It does not have to be understood in detail by millions of people.'(36)

Retail tariffs.

When examining the retail tariffs, this means dealing with the demands of millions of consumers for electricity instead of only twelve as in the case of the bulk supply tariff. It may be useful to precede the examination of the retail tariff structure by discussing briefly the structure of

(35) Meek, D.L. Ibid. p.107 and Eastern Electricity Board, Annual Report 1961 p.48.

(36) Edwards, R. Op.Cit. p.35.

costs which affect the framing of these tariffs. Initially costs were divided by Hopkinson into two categories, standing costs and running costs. The former are the costs of capacity installed to supply electricity and the latter are the costs of actually supplying electricity.(37) At present economists divide electricity supply costs into four categories according to their relation to output.

- (a) Capacity costs. These are the costs depending on the anticipated maximum demand in Kilowatts on the whole equipment or on part of it including interest, depreciation, maintenance of fixed equipment, and wages and salaries in power station operation and grid control.
- (b) Energy costs. These are chargeable according to the number of Kilowatts generated. They consist mainly of fuel and labour costs at power stations and general administrative charges which vary with the amount generated.
- (c) Consumer costs. These vary with the number of consumers because the cost of distribution

(37) Byatt, J.C.R. The genesis of the present pricing system in electricity supply. Oxford economic papers Vol. 15 March 1963.

networks varies with the number of consumers. They include the cost of meters, accounts, wiring etc. These costs would be higher in rural areas than in urban areas.

- (d) Residual costs. These are relatively a small item which does not vary with anything. They comprise some management expenses such as the chairman's salary.(38)

The principles on which the different types of tariffs should be based are to frame the tariffs on economic background, (i.e. to relate tariffs to their costs of supply) and practical applicability. To relate tariffs to true costs is an extremely difficult practice because of the complex structure of costs of supply. Practical applicability is always shown in the efforts of directing the formulation of these tariffs towards securing a high load factor by lowering the price within certain limits for increased consumption per KW to make the costs of supply as low as practicable. The exception here is the flat rate tariff designed as a single charge in proportion to the number of

(38) Little, E.A.D. The price of fuel Oxford 1958 p 54-55 and Howthaker, H.S. Electricity tariffs: in theory and practice Econ. Journal March 1951.

KWh supplied. The rate, in this tariff, is fixed on the basis of overall cost including a reasonable return on capital invested. It was only charged to domestic consumers for lighting purposes. Thus the flat rate tariff would not in general conform with the economics of electricity supply. It does not reflect the incidence of different types of costs, as shown above, in a complex supply system. Therefore a two-part tariff was developed. It consists of a fixed charge per annum and a low running charge. The fixed charge is estimated in advance and measured by the rateable value, floor area or number of rooms of the consumer. The running charge depends on the actual consumption of the consumer. It encourages the consumer to use electricity not only for lighting purposes but also for a wide variety of other domestic services. The practical application of the two-part tariff in the domestic field has shown an important defect. A fixed charge based arbitrarily on the size of a house or its rateable value is not directly related to the electricity demand of the consumer and the capital costs which are involved in supplying him. Consumers in a house of given size or rateable value

may make very different demands on the supply system at times of peak and therefore impose different burdens on fixed costs.

An increase in the flexibility over the two-part tariff is provided by the block tariff. The block tariff is designed in a series of blocks usually about four in number at progressively lower prices. This tariff is attractive to consumers who do not want to be committed to periodical payments without relation to their actual consumption.

The main criticism of domestic tariffs is that they do not contribute to the system peak load.(39) The Ridley Report of 1952 states 'that the domestic two-part tariff and block rate vary the charge with a measure of the size of house and with the amount of electricity used - but not with the extent to which the individual user contributes to system peak load.(40)

For large industrial and commercial consumers the present pricing system adopts the maximum demand tariff. This tariff consists of a standing charge

(39) Worswick (Ed.) The British economy in the nineteen fifties 1962 p.412.

(40) Report of the committee on national policy for the use of fuel and power resources. September 1952 Cmnd 8647 para 242.

based on maximum demand and a running charge. The running charge is changeable according to the fuel clause which ensures that the relationship to energy costs is maintained when the cost of fuel varies. The standing charge includes capacity costs and consumer costs. The main difficulty in applying this tariff is the necessity for two meters, the maximum demand meter which is expensive for small industrial and commercial consumers, and the ordinary meter. Another difficulty is the fact that industrial consumers who take nearly all their current at night (off-peak) which requires no additional capacity, have a maximum demand which has no significance to capacity costs.

To overcome the former difficulty maximum demand may be determined by actual measurement at the time of starting service of installation. But the objection is that it would not be correct to charge consumers on individual maximum demand on the basis of system maximum demand in operation.

It can be seen from the above examination of the tariff structure that the main problem is that prices do not reflect the proper costs of supply. The Herbert report states that industrial consumers complain that they pay much more for their electricity than domestic consumers, who may have similar individual load characteristics. (41) Meek also argued that electricity is not a homogenous commodity. 8 A.M. electricity is different from 9 a.m. electricity and summer electricity is different from winter electricity. There are widely different costs of production in each of these cases. He continues 'on the principle that prices should reflect costs, therefore, it follows that the retail tariffs should lay down different prices for the different commodities which are produced and that the wholesale tariff should be such to encourage and facilitate the formation of retail tariffs of this type.(42) But this would raise the problem of standardisation of the bulk supply tariff discussed above.

(41) Para 338.

(42) Meek, Op.Cit. p.118-119.

Costs and tariff in Egyptian electricity supply.

The Egyptian pricing system of electricity supply has different features compared with the British system. For example, first the price charged to different consumers is relatively very high compared with the British rate of charge. It has been stated that an average unit price in Cairo is about three times that in Britain, taking into consideration that the Cairo area is the cheapest area of supply in Egypt.(43) Secondly, discrimination between consumers is obvious, each electricity supply authority in Egypt having a different tariff structure. Thirdly, differentiation between peak and off-peak, day and night and winter and summer is basically applied in the Egyptian tariff structure. Within these three points the structure of costs and tariffs in Egyptian electricity supply industry will be examined.

From the early days of supplying electricity in Egypt the costs of generation and transmission were very high, consequently tariff levels were very high too. The reason was that electricity suppliers

(43) Fouad, F. Electricity and socialisation
Arab Students Journal 6. 1. 65. in Arabic.

were mainly private foreign concessionaires. Domestic consumers, for example, in Cairo and Alexandria, were charged about twenty millimes per KWh (millime being $\frac{1}{4}$ d.) Industrial, commercial, public lighting and other purposes were charged less than this rate under a special agreement with these companies. Thus from the very start Egyptian tariffs were very close to their costs of supply, because interference from the Government in the national interest was meaningless at these times. The situation remained mainly unchanged till the nationalisation of the whole supply system in 1961. Even after that it appears from the tariff structure that costs are the predominant factor of the tariff structure. Before details are given about the structure of tariffs, the question should be asked, why are costs so high?, and why are they different from one area to another?. First, production costs are high because of the lack of cheap local fuel and the high costs of imported oil. Secondly, the high costs of transporting fuel oil by railways and road between different areas of generation are expensive. There is no set of pipelines, for example, between Egyptian areas. Hence the cost of transport is the main

factor for differences in costs between areas. Thirdly, generating plants are small in size, which increases the cost of production. Fourthly, some of the plants use diesel oil which is the most expensive conventional fuel, and finally, a common factor, that is the lack of grid system which requires that every plant must have a stand-by plant for emergencies which makes a large part of capital unproductive. These factors are obvious from the tables given in Appendix (8) which show the differences between costs of supply. An additional factor may be given, that is, until the present time hydro-electric power was not contributing much in the supply system. Before 1960, hydro-electric power was generated only from Nag-Hammedi Barrage and the Fayoum Province, both being small stations. The Aswan Dam hydro power plant working at full capacity in 1961 has given more electric current, but the utilization of this source is mainly confined to the chemical industries sited there, so it is not practically helping in the reduction of supply costs to the main load centres in Cairo and the Nile Delta.

Because of the reasons given above the pricing system is much more complicated than the

British one. To simplify the tariff picture in the whole system, examples will be given of the different tariff structure applied by the four main authorities in Egypt.

The Cairo Electricity and Gas Administration.

This Authority is the largest supplier in the country. The charging methods applied may give a general idea about the whole system. The Authority supplies the city of Cairo and some of its suburbs. Discrimination in prices is found even between the same class of consumers. For example, for the purpose of lighting, the normal subscribers are charged a flat rate of about 24 millimes, while for the same purpose, Government consumers, charity societies, public hospitals, religious institutions, orphanages and so on, and sporting clubs are charged a tariff of about 21.6 millimes per KWh. For another purpose in the domestic field, i.e. consumption from use of electrical appliances, consumers are categorised into two. Ordinary consumers, who have a choice of either of two types of tariff (a) a single tariff for the whole consumption at any time, with an average charge of 14 millimes per KWh or (b) a double tariff varying

between day and night. The day rate is about 10 millimes per KWh and the night rate is 24 millimes per KWh. The second category is Governmental consumers, and the tariff here is block tariff and it also differs between day and night. This latter tariff could be illustrated in the following table.(22).

TABLE 22.

BLOCK TARIFF FOR GOVERNMENT CONSUMERS.

Day Rate	Mms/KWh	Night rate	Mms/KWh
First 200 hrs.	12	First 400 hrs.	21.6
following	8.7	following	15.4
1800 hrs.		600 hrs.	
rest of energy	7.7	rest of energy	8.7

Differentiation between winter and summer is also applied in the Authority's tariff, (Appendix 9) for comparatively large consumers. To keep tariffs as close as possible to costs of supply the fuel clause is to be added to the price of each KWh, but this is only for large consumers who reach the lower rate (equal to or less than 10 millimes per KWh.). For consumers who appear to be the largest in the country are charged, similarly to the British system,

a maximum demand tariff (or big consumer tariff). The maximum demand is fixed as more than 500 KW. The charge is based on a two-part tariff, a fixed annual charge and a running charge based on a step tariff system (Appendix 9). A promotional tariff is constructed for national interest. For example, when the Iron and Steel industry was first founded in Egypt, a special agreed tariff was introduced to the Steel Company, at a very low rate. It was designed as 'up to and including 50,000,000 KWh, the rate was 5.9 millimes and all energy exceeding this sum at a rate of 3.6 millimes per KWh'. Also one of the biggest tourist companies was promoted a lower tariff.(Appendix 9).

Other authorities supplying electric power in Egypt have, more or less, the same tariff structure but with different rate. This is mainly according to the difference in supplying costs as mentioned above.

In a country which has two sources of supply (hydro-electric and thermal power), the difference in costs is seen in its pricing policy. For example, the hydro-electric power department (which is, mainly, in charge of the Aswan hydro-electric

power station) is promoting a tariff at a much lower rate than any other Authority. The main reason is the lower costs of producing and transmitting electricity.

To sum up, the reasons for various tariffs applied in different regions are:

- (1) Costs of generation and distribution vary between different regions.
- (2) Pricing policy of the different authorities may have an effect on the tariff structure. Even after the nationalisation of the whole industry the pricing policies may not be changed yet.
- (3) The aggregate size of the undertakings are different, while, for example, the Cairo Administration serves about 3 million population, Alexandria Organisation serves only about 1 million, so that the scope of inter-consumer subsidies differ correspondingly. Finally, the administrative costs, which imply an important factor in the costs of production, also vary between one Authority and another.

There is now a tendency in the Egyptian electricity supply industry, towards uniformity of

tariff. The main reason seems to be one of social equity, for instance rural areas in Egypt have been for a long time without electricity for economic reasons.

We have seen from the British experience that uniformity of price is strongly criticised. But it is expected to be praised in Egypt for social equity.

Conclusion.

The main problem of pricing policies in the nationalised industries is whether to consider them as purely commercial undertakings, or as social services of a non-commercial kind. The British nationalised industries are regulated by public Acts and regulations, and there is nothing to prevent them from operating at a surplus.

Methods of charging discussed in the section are: the break-even principle, the low prices rule, the average cost and marginal cost methods.

The break-even principle is criticised as it does not consider the elasticity of demand. For example, electricity charges may be above or below the costs of supply if demand is inelastic or elastic respectively. If electricity tariffs are so high and the demand is elastic, consumption will be diverted to substitutes and consequently the industry could not cover its costs from revenue.

The low prices rule tends to lead to misallocation of resources, if prices are below costs.

The controversy about average versus marginal cost pricing is too complicated to select one or the other. However, with regard to the electricity

supply the opinion that at peak times prices should correspond to their marginal costs while at off-peak periods tariffs should be based on the average cost of supply, needs further study.

Discrimination between classes of consumers is economically justified as a method of pricing. Electricity Authorities could discriminate between various classes of consumers in such a way that these Authorities could attain the highest possible surpluses. But discrimination between consumers in the same class should be legally forbidden and discrimination between classes should be limited to state regulations.

Uniform tariffs are strongly criticised on the grounds that they do not reflect the proper costs of supply. Nevertheless standardisation of electricity tariffs has been clearly advocated by Electricity Acts in Britain and there is a recent trend towards uniformity of electricity prices in Egypt. Uniform tariffs appear to be nationally desirable because the consumers feel that they pay the price which is similarly charged to the same class of consumers anywhere else in the country. Generally it is not desirable that consumers of urban areas, where costs are relatively low, should

subsidise consumers in rural areas, where costs of supply are high. While this is possible in Britain, uniform tariffs in Egypt may be nationally desirable because urban consumers are usually of much higher standard of living than rural consumers.

Taking into account the above discussion, a correct price policy in the electricity supply industry should lead to an appropriate tariff structure. It was not the aim of this study to investigate in detail the tariff structure applied in Britain, and to examine how far any of the methods are adopted. But from the brief outline of the tariff structure in Britain and Egypt it could be noted that there are wide differences between the two structures. In Egypt the average price level is much higher than in Britain. In addition, while standardisation may be a dominant method in Britain, within the same class of consumers, in Egypt it is found that Electricity Supply Departments charge widely different rates taking into account the difference of costs and some social factors as is seen from the low prices charged to Government consumers, charities and so forth,

Wages policy.

It has been mentioned in the previous section that pricing policies in the nationalised industries, including the electricity supply industry, are decided on both economic and social considerations. Wages policies may follow the same principles. Economically, if wages rise, for example in the electricity supply industry, tariffs charged tend to rise to meet the costs. But if tariffs do not rise due to Government policy this does not mean that wages will be stable because wage claims through organised trade unions are frequently raised. One of the main reasons for these claims is the raising of the Retail Prices Index. Thus, in contrast with private enterprise, where a wage dispute is discussed between the employers and the trade unions of the industry concerned, in public enterprises there are three bodies which influence the decision taken regarding wages claims, the Boards, the trade unions and the Government.

Before examining the role of these three parties in wages policies, two points should be made clear, the first is the key position of public

enterprises in the national economy, particularly the electricity supply industry, and the second is the wages structures in the public sector. In Britain the former factor is obvious in the electricity supply industry. There are several reasons for this: the large number of employees and workers involved in any wage dispute; it is a capital intensive industry; capital investment per employee averages about £1200 (taking the C.E.G.B. only the figure is about £26000 or more.) It is a growing industry expanding at an unusually high rate. 'It therefore has both the problems and opportunities that come with rapid growth.'(44) On the electricity supply industry depend most of the essential services such as water supply, sewers and others.

Because of this key position of the electricity supply industry as well as of other nationalised industries in Britain, the fear of the grave consequences of official and unofficial strikes should be taken into account in wage policy. Examples of these strikes are known; for instance,

(44) Edwards, R. Human values and human problems in electricity supply, Electricity Council 1963 p.1.

unofficial stoppages, 'go-slow' campaigns in the coal industry range between 1500 and 3400 each year.(45) Many of these strikes are due to disputes about wages. Also in the electricity supply industry strikes have occurred in several years since nationalisation. The danger of such strikes in the electricity supply industry may be illustrated by the unofficial walkouts which occurred at four London power stations in December 1949 and which caused considerable disturbance and load shedding. The Government was obliged to call men from the armed forces to maintain essential supplies.(46) Recently in March 1964 after the Electricity Boards and trade union members had failed to reach agreement on wage claims, the trade unions instructed their members to operate a ban on overtime which took effect from the 23rd of March to the 1st of April 1964.(47) Consequently the output of the Generating Board's generating plants was drastically reduced. As an effect 'towards the

(45) Robson,^w Nationalised industry and public ownership p.330.

(46) The Times 13 to 17 December 1949 quoted by Lewis Ben, British planning and nationalisation p.116.

(47) Electricity Council Annual Report and Accounts 1963-64 p.57.

end of the period one third of the generating capacity which would normally have been in operation was immobilized and it was necessary to reduce demand by voltage reduction for long periods during the last four days of the ban.(48)

These are some of the considerations which should be taken into account in wages policies in the nationalised industries in general and in the electricity supply industry in particular.

If it appears from the above discussion that the key position of these industries in the national economy has a particular effect on the structure of wages, the questions here are whether the wage levels in the nationalised industries are higher than those in private enterprises, and whether the rate of increase in wage pay is higher than in other industries? Although it may be argued that the nationalised industries can attain a higher level of wages than private enterprises, because of the elimination of private profit, there is evidence against this. M. Shanks states that the raising of wage rates in the nationalised industries has proved to be difficult to maintain.

(48) Central Electricity Generating Board. Annual Report and Accounts 1963-64 p.14.

The Guillebaud Report has proved the failure of wage rates in the Railways to keep pace with other industries; there is also the loss by the miners of their leadership in the earning league.(49) M. Shanks shows in a (man's rates) table that only the electricity and gas industries show a marked increase in the level of wages greater than the average of industry as a whole. He concludes that, in general, wage rates in public enterprise have risen no more quickly than elsewhere. B.C. Roberts says that in many private enterprises wages and working conditions have improved as rapidly as, in some cases more than, in the nationalised industries.(50)

Hence it seems that, generally, the increase in wage rates in the nationalised industries, results in a wage-level not higher than in private enterprises.

The British electricity supply industry is in a better position regarding the wages level. It may be thought that this higher wage level exists

(49) Shanks, M. (Ed.) The lessons of public enterprise, London 1963 p.72.

(50) Roberts, B.C. Trade unions and nationalisation, Progress Vol. 44 Winter 1954-55 by Hanson, (Ed.) Nationalisation: a book of readings 1963 p.374.

because the industry is reasonably prosperous, more than other nationalised industries. But, in fact, this is not an effective reason, because wages in public enterprises are not based on what the industry can afford to pay; wages and salaries are fixed, among other factors, according to the general trend in the whole public sector. This is clear from the fact that the Railway workers have been granted wage increases though the industry does not pay its way. It has been claimed that the reason for higher wage levels in the electricity supply industry is, in fact, as mentioned above, due to the importance of the industry, upon which depend many vital services, and to the large capital investment per worker involved. Professor R. Edwards states that because of these reasons, it makes good commercial sense to ensure that wages and salaries are at the levels which enable good quality employees to be recruited and to be retained in good heart.(51)

Does this mean that the supply of labour is influenced by the level of wages in the industry.? In other words can the electricity supply industry,

(51) Edwards, R. Human values and human problems in the electricity supply industry, Electricity Council p.8.

because of its higher wage level, attract labour more than other industries.? On the one hand there are some writers who think that the wage levels are not an effective factor in determining the quantity and quality of labour supply. T.P. Hill states that because of the imperfection of the labour market the supply of labour is not affected by the level of wages, and there are many firms which seem to be able to maintain an adequate labour force despite the fact that the wage level of these firms is very low compared with other firms, even in the same locality. The argument here is based on the fact that wages are not fixed in response to the forces of supply and demand for labour. For example, the National Coal Board in Britain has attracted labour from all over the country by using mainly two methods other than higher wages. One is the considerable publicity given to vacancies in the industry, and by offering comprehensive housing facilities in the area which requires an adequate labour force. In addition, there may be some other social factors which influence the workers' willingness to accept or remain in any particular job. Some of these factors are the security of

employment, pension prospects, suitability of surroundings and working conditions.(52)

From the above argument it may be clear that the electricity supply industry cannot attract a labour force adequate to its needs, merely on the grounds of having a wage level higher than other industries in the public sector or in the private sector. But other social factors should be taken into account.

Let us now examine the wages structure in Egypt.

In Egyptian public enterprises wage levels may differ widely. From the census published in 1962, some of these industries are shown in the following table (23).

(52) Hill, T.P. Bulletin of University of Oxford Institute of Statistics 1962 p.185.

TABLE 23.

AVERAGE OF MONEY WAGES PER WEEK.
FIRST WEEK OF WORKING IN PIASTERS(53)

Industry	July x		January o	
	1957	1958	1959	1960
Mining (crude oil and natural gas)	874	813	993	950
Textile	212	217	219	210
Electricity and gas	405	388	394	384
Transport	351	340	348	337

x There is no census on January 1957 & 1958

o There is no census on July 1959 & 1960

Source: Annual Census 1960-61 Department of
 Statistics Cairo 1962 (in Arabic)

From figures shown in this table, two facts can be seen. First, while in the period July 1957 - January 1960 money wages were slightly increasing in mining, they were nearly stable in textile and slightly decreasing in electricity, gas and transport industries. Second, wages in mining industries are much higher than in other industries shown in the table. Textile is at the lowest level. The wages level in the electricity supply industry is nearly

(53) A Piaster is approximately 1/5 of a shilling.

half of mining. The wide difference in wages levels between these industries may be partly due to the fact that the factor of supply and demand for labour was to some extent influencing these levels. Up to 1961 these industries were not fully owned and controlled by the Government except electricity and gas which were partly nationalised. It may be also noted that the reason for lower wage level in the textile industry is due to a considerable proportion of female workers who usually have lower wages than male workers. However, after the mass nationalisation in 1961, there was a move towards equal wages levels in the whole public sector. The main reason may have been the elimination of a free labour market. Supply of labour is now under government control. This is, to a greater extent, true in newly established public enterprises, while public enterprises which were privately controlled, before nationalisation, may still enjoy a distinctively higher level of wages.

On the whole it may be said that wage determination is not, to some extent, influenced by the forces of supply and demand for labour. In both countries, Britain and Egypt, other factors play a crucial role in wage determination.

Another principle on which wages may be determined is that of fair comparison. This method indicates that similar rates of pay should be granted to workers who do similar jobs. This may be applied within one industry - comprising several regions - where workers doing similar jobs may have a uniform rate of pay. The same method may be applied in different industries where workers of similar quality may have similar rates of pay. One of the main factors influencing the tendency towards uniform wages, based on fair comparison, is the centralisation of wage-negotiations. However, though fair comparison of rates of pay appear to be just, the method involves serious economic criticism.

In one industry uniform wages do not take into account the economic differences between areas. For example, an area with high unemployment can offer lower rates of pay than an area with a shortage of labour. Also there are some areas of high cost of living which should grant a relatively higher level of wages. It should be noted that this is already in existence in the British nationalised industries (e.g. London differentials.) (54)

(54) Shanks, M. The lessons of public enterprise p.86

As between different industries comparable wages indicate that similar rates are paid to workers of similar skill in other enterprises. For example, equal rates may be given to manual workers in the electricity supply industry and the railways, or equal salaries for employees in public enterprises and civil services.

The main criticism of comparable rates of pay between different enterprises is that the method does not take into account the increase in productivity. For example, it is uneconomic to increase wages in the British railways, with its persistent loss at a similar rate to that in the electricity supply industry. If the latter industry raise their wages proportionately with increasing productivity, and then the railways duplicate this wage increase on the grounds of comparability, the total wage increases in the economy will be greater than the total increase in national productivity, thus leading to inflation. This is, in fact, the main difficulty in drawing up a correct wages policy in public enterprises which indicate that wage increases should correspond to productivity increase in the industry concerned.

Another criticism is that if wages increase in any industry for any reason, this will lead to a similar increase in another industry and so on, which will result in a wage spiral and again in inflation.

But it could be argued that in public enterprises two points are in favour of comparability. One, a public enterprise which does not pay its way may be regarded as a public service working in the national interest. In this case wages cannot be related to the enterprise's profitability, especially when it is known that there is a great deal of government intervention in prices.

The other reason is that when workers' representatives cannot argue that wages should be increased so as to share a profit which is non-existent they put their wage claims on the grounds of social justice. That is, wages should coincide with the increase in the Retail Prices Index.

The question which could be raised in this context is, whether a public enterprise which is reasonably prosperous should increase wages.?

In the British electricity supply industry, for example, it has been argued that surpluses in the industry are only a result of a policy decision, as to how much the consumer should pay towards capital development. This means that the increasing capital investment contributes to a greater extent to the increase of surpluses, and that there is, therefore, no reason for taking a more generous line on wages and salaries. Similarly if the industry works at lower surpluses, it would be wrong to use this factor in the negotiation of wages and salary settlements.(55)

The latter part of this argument has already been discussed in the case of a public enterprise which does not pay its way. In the former case one could argue that an increasing surplus in the electricity supply industry, even if it does not result from the direct contribution of workers, is still a reason for increasing wages, for the distribution of incomes.

The whole argument about wages policy examined above may show that supply and demand for labour, and

(55) Edwards, R. Human values and human problems in the electricity supply. p.10.

comparability are not decisive factors in wage settlements. It is obvious that a correct wages policy in public enterprise is that which relates wage increase to productivity increase in the industry concerned. This is, in fact, the main target of a national incomes policy.

In Britain, for instance, the White Paper on Incomes and Prices states that the main aim of the Government is to raise productivity and efficiency so that real national output can increase and to keep increase in wages and salaries in line with increase in productivity. To achieve this target the Government lays down a norm indicating the average rate of annual increase in money incomes per head.(56) To apply this norm the White Paper states that it is necessary to take into account 'not only increases in wages and salary rates but also increases in costs resulting from reduction in working hours without loss of pay, from higher rates of pay for overtime or shift work and from improvements in fringe work.'(57)

(56) Prices and Incomes Policy White Paper, Cmnd. 2639 April 1965 para 11.

(57) Ibid. para 13.

The aims of an incomes policy are not easy to reach, because of the difficulty in getting an agreement between the interested parties in wage negotiations. However, in public enterprises it may be less difficult. The Government is bound to have a more effective role in public enterprise than other sectors in the economy. The factors which make the public boards give effect to the national wages policy are:

- (1) Public boards are accountable to Parliament and their policies are influenced by ministerial instructions about the Government's wages policy.
- (2) Public enterprises are not free in their pricing policies as mentioned in the previous section. The fact that they cannot increase their prices of products and services to meet wage costs, the lack of self-financing and government limitations of borrowing powers make it more difficult for the public enterprise to grant wage increases without ministerial approval.
- (3) Apart from the economic and statutory factors mentioned, there is always a close relationship

between Minister and public Boards' Chairmen which means that the latter are influenced by the Minister's views.(58) Indeed these factors could give effective results to the national wages policy, especially when it is taken into consideration that public enterprises employ a large number of workers and salaried employees.

The Government and the Public Board are not alone in any wage dispute. They are faced by a strong opponent, that is the Trade Union. At this point it is necessary to give more detail about the role of the three parties concerned.

Trade Unions and Boards' roles.

In Britain, it may be argued that trade unions in the nationalised industries are likely to hold a strong position in negotiating wage demands, because of the large numbers of their members in any of these industries and because of the threat of strikes. The position of the trade unions has been described as one which may become dominant, oppressive and sometimes menacing.(59) What may

(58) Details of the Government's role will be given later in this section.

(59) Robson, W. Nationalised Industry and Public ownership p.320.

strengthen this position is the limited freedom which the management of the nationalised industries have. However, the role of the management and the trade unions has been expressed in widely differing points of view.

The Acton Society Trust gives two views. On the one hand, the Trust states that the management of the nationalised industries have much less freedom to negotiate than the management of private enterprises, because of ministerial directions and the need to work within the country's planning policy; the managements' decisions may be taken as a precedent for other nationalised industries and because any mistakes will be subject to severe public criticism. On the other hand, although trade unions know the weak position of the management because of the reasons mentioned, they do not want to handicap the nationalisation experiment. 'So the trade unions are in a position to negotiate on reasonable demands.(60)

G. Baldwin remarks that nationalisation 'has not provided the workers with a horn of plenty into

(60) The future of the unions No.8., 1951 pp 15-16.

which they could dip their hands whenever they felt pressed by the struggle for life.' The attitude of management has generally been firm.(61)

Other schools of thought attack strongly the powerful position of trade unions in the nationalised industries. Wages claims by the unions are annual without necessarily special reasons, which result in similar claims in the whole country. Decisions on wage claims are taken from the management side by men who were formerly trade union leaders. They can hardly change their habits and are not expected to deal with wage negotiations in a judicial way.

The serious criticism against the trade unions' role in wage-claims is that the trade unions have a political influence which can be exercised in persuading Ministers or Members of Parliament to influence the Boards' attitude. B.C. Roberts states that with the political influence which the unions exercise they can secure improvements over the heads of the Boards. He gives the examples of the five day week policy in the coal industry and

(61) Quoted by Robson, W. Op.Cit. p.321.

the two wage increases in the railways as having been decided in this way. He goes on to say that the great danger of this development, if it were to go very far, is that wage policy in publicly owned industries would become a political matter.(62)

The above examination of views on the role of trade unions and management shows two very different attitudes. One is that the trade unions in the nationalised industries are not in a strong position and that the Boards have always been firm in wage decisions. The other is that the trade unions have a great power over the Boards in wage negotiations backed either by their former officials working in the industry concerned or by the political influence which the trade unions have over the Boards to achieve their aims, or both.

With regard to the ex-trade union leaders who work in the industry concerned, it has been confirmed by B.C. Roberts that ex-trade union leaders 'are expected by the rank and file to behave as though they were still employed by the union.'(63)

(62) Roberts, B.C. Trade unions and nationalisation. Progress Vol. 44 No. 245 Hanson, A.H.(Ed.) Nationalisation, a book of readings London 1963 p.377.

(63) Ibid. p.376.

As far as the political influence is concerned it may be argued that not all the trade unions have political ideologies which may have an effect against the interests of the industry, and the political influence is, in fact, limited by that of the Government in office. It has also been claimed that the danger of sectional interest may arise from some trade unions with strong political ideologies. Wage-pressures may result when the political party to which the trade unions are affiliated comes to power. These consequences may work against the interest of the public enterprise concerned and that of the national interest.(64)

This, in fact, is not generally true. The Labour Government in Britain at the present time, (1964-65) has a different attitude towards the trade unions. The White Paper on Incomes and Prices does not exclude the nationalised industries from following the Government's norm. But even if the trade unions have this political influence, they may not act in the wage dispute in the nationalised industry in question to the extent which will result

(64) United Nations Organisation and administration of public enterprises in the industrial field New York 1954 p.45.

in a handicap to the nationalisation experiment, as mentioned. And the trade unions are also interested in the efficiency of the nationalised industries because it is ultimately in the interest of their members. Assuming that the political influence of the trade unions is lessened by those factors, and assuming that the ex-trade union leaders sitting on the Boards will behave in the interest of the industry, - even if it is against the workers' desire, - wage negotiations will be left to be exercised by the normal procedure, i.e. between the trade union and the management. Even with the given assumptions, the trade unions are in a powerful position. This is because of the reasons given at the beginning of this section; there is also the fact that if the trade unions insist on their claims with threats of strikes, the nationalised industry would have to meet the wage-claims, either by more borrowing or by increasing prices.

The rôle of the Government.

When wage negotiations are conducted freely between trade unions and the management of the industry concerned a possible result is, in view

of the powerful position of the trade unions and of the possible willingness of the management to accept wage claims in order to hold their labour force, that wage claims will be met. If this happens a wage price spiral will exist. Increase in wages will lead to increase in the level of aggregate consumption, without corresponding change in output resulting in an increase in the level of price which in turn will result in further wage claims and so on. Because of this inflationary trend the Government may intervene to protect the national economy against inflation.

As mentioned the Government is likely to achieve an effective incomes policy through public enterprises. Public enterprises employ a large number of wage and salary earners. If the Government successfully intervene in one nationalised industry to settle a wage dispute, this may prevent other nationalised industries from having wage increases and possibly avoid labour organisations in private industries raising more wage claims. What is the British Government's role in practice?

It has been claimed by several sources that the British Government is often reluctant to

intervene in wage disputes. The O.E.E.C. Report in 1961 recorded only one occasion, in the fifties, when the Government succeeded in moderating the rise in wages by taking a firm line in its attitude towards wage negotiations in the public sector.(65) But far more often, the Report states, lack of consistency in this field has been an important factor in the almost continuous wage-wage spiral.(66)

It is true that, unlike in some other countries, the British Government's intervention in wage disputes in the nationalised industries is moderate. For example, in the French nationalised industries wages and salaries cannot be changed until the appropriate Minister has asked the advice of an interministerial committee dealing with wages and salaries.(67)

To illustrate the Government's attitude in wage negotiations, we may examine the extent of ministerial intervention in wage disputes in the British electricity supply industry.

(65) O.E.E.C. The rise in prices 1961 p.61.

(66) Ibid. p.61.

(67) Lewis, E.G. Parliamentary control of nationalised industries in France, American Political Science Review Vol. 51 1957 p.678.

In the electricity supply Acts 1947 and 1957 it is not clearly stated that the Minister concerned will intervene in the current wage negotiations. It is only the responsibility of the Electricity Council or the Area Boards to settle by negotiations terms and conditions of employment of persons employed in the industry. But it is the Minister's statutory power to give general directions. These directions may include that there are to be no wage increases given before a particular time; or the Minister may give as a general direction that no wage increases are to be granted without his permission.(68) But at the time of negotiations it is not legal for the Minister to issue any directions of general character regarding wage disputes. However, the Government has always preferred to proceed 'by leaving the Chairman of the industry in no doubt what the Government policy is.'(69)

To conclude, it is obvious that direct intervention by the Government in current wage negotiations is neither legally established nor

(68) Select Committee on Nationalised Industries
May 1963 Q 305.

(69) Ibid. Q 306.

actually practised.

If this is so, how can the Government give effect to its national incomes policy in the electricity supply industry.?

To some extent, this could be achieved by a close relationship between the Minister concerned and the industry. For instance, according to the Electricity Council:

- (i) The Minister has kept the Electricity Council closely informed of the Government's economic policy with particular reference to incomes.
- (ii) The Electricity Council have kept the Minister closely informed on the wages and salaries situation and on each occasion of a claim have given the Minister an appreciation of the facts.
- (iii) The Electricity Council have given full consideration to the Government's policy as conveyed to them by the Minister and have taken that policy into account before decisions on wage matters have been taken.
- (iv) The Electricity Council, however, having considered Government policy have regarded themselves as having a duty to reach their own decisions in the light of the whole of their

duties and have taken full responsibility for those decisions.

If this procedure is carried out as explained, two important principles could be attained: first, the freedom of negotiation between the Boards of the electricity supply industry and the trade unions, second, and most important, the national incomes policy drawn up by the Government could be followed by one of the important industries.

However, freedom of negotiation seems to have been maintained in the electricity supply industry. The present Chairman of the Electricity Council affirmed this freedom by saying that during the wage negotiations in winter 1962-63, it was from the beginning to the end in the hands of the Chairman and his colleagues.(70)

With regard to the second point, the question is, is such a relationship between the Minister and the Electricity Council a safeguard to apply the aims of the national policy? In precise terms, will the rate of wage increase not be above the norm decided by the Government.?

(70) Report of the Select Committee on Nationalised industries May 1963 p.59.

It has been suggested that to adopt the Government's policy, i.e. to set a norm for the rate of increase in wages and salaries, it may be of benefit to arrange for the Government to be represented at any important wage negotiation, not simply as mediators but as an interested party to represent the general public's stake in the outcome.(71) It has also been suggested that it is not reasonable that this function should be neglected or at best left vaguely to the press and public opinion, and it has been emphasised that the Government should participate in the negotiation at an early stage rather than intervene only after attitudes have become crystallised as in the case of arbitration.

Press and trade unions would object to direct intervention by the Government. They believe that wage negotiations should not be directly or indirectly held with politicians. There are also doubts whether this participation would have a practical effect. In other words, unless the Government were represented by a

(71) O.E.E.C. Report, the rise in prices, 1961 p.59.

sufficient number on the negotiating table, they would be outvoted. A more serious criticism of this participation is that once the negotiation fails and strikes begin, these strikes will be more serious because they will be partly against the Government.

Finally, one could say that in spite of these criticisms intervention by the Government may become a necessity in some particular disputes, because the breakdown of negotiations and the suspension of important services will not be accepted by the public.(72)

(72) United Nations, Op.Cit. p.44.

Conclusion.

It may be seen from the discussion on wages policies that some of the economic principles on wages policies can not easily be applied in practice. The relation between price and wages is lessened by the fact that wage claims are partly based on reasons other than rise in the industry's charges, as expressed in the rise in the Retail Prices Index. Supply and demand factors are also not decisive in wage levels. Other factors are taken into account. This has been clearly shown in the evidence on the wage levels in British and Egyptian public enterprises. Comparability of wages in different industries may be wrong according to economic principles but it is already in existence, because of the centralisation of wage-negotiations.

However, the main aim in wage policies in public enterprises and in the electricity supply industry is to relate wage increases to productivity. But this is again influenced by the fact that trade unions in Britain have a powerful position and because the Government's role is moderate which result in a higher rate of wage increases than productivity rate.

It may not be possible to convince the trade unions of the economic policy of the Government, but it may be possible to increase the role of the Government on the negotiating table. Though the latter suggestion may have some drawbacks it is certainly useful in certain circumstances.

The procedure of wage settlements in Egyptian public enterprise is not available.

CHAPTER V.

CENTRALISATION AND DECENTRALISATION.

Centralisation and decentralisation.

In the preceding chapters of this study, investigation has been made into some of the managerial and economic problems of public enterprises with particular reference to the electricity supply industry. In this chapter one of the managerial problems will be examined, that is, the centralisation and decentralisation of enterprises' activities. The purpose of this chapter is to find out where the authority of making decisions is located.

To start with it would be useful to define the two terms, centralisation and decentralisation. Economists and administrators differ, sometimes widely, in defining these two terms. Arising from the difficulty of definition, there is the question of the appropriate forms of decentralisation. For example, if decentralisation means that lower levels of management have complete autonomy in dealing with all economic problems, this would result in a form of complete decentralisation. But if decentralisation means the delegation of only specific functions, this would result in a limited form of decentralisation. In this case what functions could possibly be centralised or decentralised?

There are general advantages and disadvantages of a centralised or decentralised process. It is unlikely that one would find a writer who is in favour of centralisation of all functions of the organisation and similarly with decentralisation. What happens is that there are lines of communication between the central authorities and lower levels of management in order to compromise between the advantages and disadvantages of either of these two systems.

Definitions of centralisation and decentralisation.

Centralisation and decentralisation are phenomena of large-scale organisations of all kinds including nationalised industries. Generally speaking centralisation means the concentration of power at the top level of management, i.e. all responsibility is retained at a central point. Decentralisation means the location of authority at any of the industry's divisions. Decentralisation could also mean the location of plants. Some economists describe the location of power stations of the electricity supply industry, according to the economic and technical factors as decentralisation.(1)

(1) Nisel, H. Centralisation au decentralisation dans l'industrie de electricite. Egypt Contemporaine Vol. XXXIV pp 41 - 55.

Regarding the meaning of centralisation, some writers think that centralisation is not uniformly coincident with the retention of power at the top. Two reasons are given, first, a management that insists on maximising the area over which it takes decisions becomes over-occupied with trivialities. Secondly, delegation very often implies that persons delegating are doing so to free themselves for more important decisions.(2)

For these two reasons one could possibly conclude that in practice there is no absolute location of all powers at the highest level of organisation. In other words, the definition which implies that centralisation is the retention of all powers at the centre is not precise.

Researching on the problem in the British nationalised industries, the Acton Society Trust gives a more precise definition. They say that nationalised industries are organised usually into two or more types. If an Area Board is largely independent, the industry is decentralised at the upper level and centralised at lower levels. And if an Area Board

(2) Spencer, P., & Sofer, C. Organisational changes and its management, The journal of management studies March 1964 No. 1. Vol. 1. p.31.

is largely dependent on the Central Authority, the industry is centralised at the upper level and decentralised at lower levels. On the other hand, a certain function can be said to be centralised when this function is decided at the centre or decentralised when it largely is decided at a regional level. The Acton Society Trust conclude their definition by stating 'it is unlikely that we can say of any industry that it is wholly centralised or wholly decentralised. We can only say that centralisation exists in certain respects and with regard to certain levels.(3) Under the Trust's definition, centralisation could be defined according to the level in the administrative hierarchy at which operating decisions are made and according to the location of the actual function.

One could argue that the Trust's definition is complicated and confusing, because we have to find out at what level a decision is taken and then it could be either centralised or decentralised owing to the organisational structure of the industry. Also we have to find whether such a decision taken on a particular level is final or not final.

(3) The Acton Society Trust: The extent of centralisation Part i. No. 6 1951 p.1.

To avoid confusion in the definition of the terms one could possibly state that the term centralisation should be used more specifically, i.e. the responsibility for a particular function is retained at the centre. The carrying out of delegated authority for this particular function by executive management at other levels but returning to the centre for final decision would not alter the meaning.

There is also no clear definition about decentralisation. There are generally two meanings for the term decentralisation. As mentioned above, there is geographical decentralisation and decentralisation of authority. What is of particular importance to notice is that the term sometimes is used in exactly the same sense as delegation, which is not absolutely correct. For example, a United Nations publication states 'delegation and decentralisation refer essentially to the same method - a fanning out of decision making so that employees at various levels in the organisation can take actions without awaiting approval by their supervisors.(4)

(4) United Nations. Organisation and administration of public enterprises in industry. New York 1954 para 27 p.52.

In fact there is a difference in meaning between delegation and decentralisation. Delegation is the act of passing to the lower levels in management the responsibility (either wholly or partly) of carrying out a certain function. This, of course, happens in any industry, large or small. There must be a delegated authority down the line of management levels. But decentralisation is the pattern of responsibilities that results from delegation. The same definition applies when authority is delegated to geographically separated units in the industry, that is, authority is delegated to executives in charge of units at different location. This latter case is only found in very large-scale enterprises.

Forms of decentralisation.

Delegation of authority may occur in different ways which will result in different types or forms of decentralisation in the British electricity supply industry.

First method.

Delegation of full responsibilities for Area Boards' Chairmen in their Areas. The Chairmen carry out all elements of management within their

responsibility. They also specify the way of co-ordination with the centre (the Electricity Council).

The fullest benefit from such a method could be achieved;

- (i) if delegation is realistic both in definition and action. This means that the Electricity Council must be satisfied to pass these responsibilities on, and the Electricity Council must encourage the Area Boards' Chairmen to carry out these responsibilities.
- (ii) if Area Boards' Chairmen are able (personally) to make final decisions on the problem in question without feeling that they have to turn to the centre.
- (iii) if the functions delegated can be practically dealt with within the Area. For example, there are some technical problems which it may not be possible to delegate, such as technical research concerning the development of the whole industry.
- (iv) In addition to the above conditions, a method of full delegation of authority can work well if the function carried out by various Area Boards are different.

However, it may be obvious that the method of full delegation is unlikely to apply in the electricity supply industry, because as it will be discussed later, there are some functions which should be decided at the centre.

Second method.

A form of decentralisation, may be, where Area Boards' Chairmen have less autonomy. Responsibilities delegated are much more limited and specified than in the first method. In a limited delegation programmes and major problems are decided at the centre (the Electricity Council), but the application of the plans and the detailed day-to-day operation attached to these plans are within the discretion of the Area Boards' Chairmen.

By this method, it is meant to benefit from widespread views of good ideas worked out at the centre by experts. The method must also be applied if it appears that Area Boards' personnel lack the ability to initiate and implement programmes.

Third method.

Decentralisation may take the form of delegating a particular function to a certain individual. This depends greatly on the special

reputation of this individual in dealing with the problem. In fact, this method may be the least frequent to be applied because of the personnel problems it involves, which may affect morale.

Although it may be possible to adopt any of the three methods in large-scale enterprise - and in the Electricity supply industry in Britain - the second method seems to be more flexible in practice. The main reason for the choice of the second method is that the delegation of some functions are unnecessary.

The above discussion about the definitions of the two terms, centralisation and decentralisation, and the assumption of different methods of delegation may be further clarified by an illustration of the functions which have to be centralised or decentralised. Before examining some of the functions in public enterprises and particularly the electricity supply industry, the argument about centralisation or decentralisation will be examined.

Centralisation or decentralisation in public enterprises.

The decision-making of a particular function to be authorised at the centre or at Area level or at

another lower level may be influenced by several factors. Some of these factors are: the character of the organisation (public corporation or Government Department), the geographical distribution of the Areas of the industry concerned, the nature of the work and its technical complexity, the qualifications and ability of management at lower levels and the outside conditions which have an influence over the industry's policy such as Government interference in favour of some functions to be centralised. In addition the statutory structure of the industry is important, for example, the gas industry in Britain is characterised by more decentralised functions than the British electricity supply industry. This is emphasised by the legal provisions for the two industries laid down by the various Acts. Incidentally, the technical characteristics of the gas industry is another factor by which there are more decentralised functions in the gas industry than other public enterprises in Britain. It has been said that electricity can be switched from one region to another and there is a national grid. Gas on the other hand is less easily transmitted over distances. Consequently the regional

or Area Gas Boards are more independent of the Gas Council than the regional Electricity Boards of the Central Authority.(5)

It is not only that one public corporation has more centralised or decentralised functions than another, but also public enterprises as a whole differ from private enterprises in this respect. It may be argued that the proportion of centralised functions in public enterprises is greater than in private enterprises. There are two reasons for this.

- (1) It has been argued that nationalisation means centralisation. A. Palmer says 'it is public ownership under state direction. The political powers and boundaries of the nation embrace the industry nationalised, neither more nor less. Whatever the theoretical autonomy of the public corporation, this is undoubtedly the view the British public take of their contemporary nationalised industries. And unless a method can be devised for appointing the boards from below or internally it is not easy (to say) the public are wrong.(6)

(5) Florence, P.S. Industry and the State London 1957 p.136.

(6) Palmer, Arthur. The background to organisation Shanks, H. (Ed.) The lessons of public enterprise 1963 p.186.

(2) It may also be argued that nationalisation could not be compatible with a greater degree of decentralisation. Because nationalised industries are large in structure and this largeness has resulted in centralisation, and, as mentioned in several places in this study, because the degree of considering the public interest in public enterprises is much greater than in private enterprises, it is a necessity that public interest should normally be dictated by legal and economic reasons in the broadest sense, rather than by narrow sectional and technological view points. This position would lead to a highly centralised decision-making of functions affecting the public interest. It is true that a considerable number of functions in public enterprises have to be centralised, but there are also some functions which are better decentralised.

More decentralisation of functions has been suggested in the nationalised industries in Britain, as a remedy to over-centralisation. H. Clegg, and T.F. Chester state that the critics of the nationalised industries have proposed the devolution

of power from a higher authority to a lower authority. They go on to say that most of the schemes put forward suggest the transfer of power from national to regional level or in the extreme case, the abolition of the central authority.(7)

In the British Gas industry, where the Gas Council have much less power than any central authority, most of the functions are decentralised. The Headquarters in the Area Boards have the power to purchase coal, to export the bulk of coke and products, the purchase of coke over gas and they have the power to decide on matters which affect more than one of the sub-areas including the fixing of gas tariffs and negotiations with organised labour. On the other hand, the British Coal industry was always described as having more centralised functions.

The functions which have to be centralised or decentralised are not easy to define. Many economists are in favour of decentralisation but at the same time they insist that some functions have to be decided at the centre. Charles Reid suggests that the authority of the National Coal Board should be confined to direct the national policy of the industry.

(7) Clegg, H., & Chester, T.F. The future of nationalisation, Oxford 1953 p.158.

The National Board would deal with the overall finance and exercise the supervision of the corporations. However, he suggests more decentralisation, in the sense that the industry should be divided into approximately twenty-six corporations. Each should be managed by a Board consisting of a managing director who would have full extensive power and other necessary executive as sales managers. (8) A practical decentralisation could be achieved not only by dividing the industry into more units under separate management, but also by the delegation of functions from higher to lower levels.

A White Paper - Cmnd. 1248 December 1960 - on transport, proposed, as it said, a structure based on more decentralisation. The White Paper explains that the Transport commission should be abolished and that statutory bodies are to be established for each of the major undertakings (railways, London Transport, docks and Inland Waterways.) But the abolition of the Commission may not completely solve the problem, because each of the undertakings is

(8) The Times March 24th 1948, Hanson (Ed.)
Nationalisation, A book of readings London 1963
p.121.

large-scale, especially the railways.

If centralisation or decentralisation should only be related to functions, and if a certain function is decided at the railways central authority, the function is still centralised. To transfer a function from the old Transport Commission to the Railways Central Authority is not a delegation.

However, it could be stated in brief that functions should be centralised or at least approved by the central authority, if they are of major importance to the whole industry. On the other hand it is preferable to delegate functions which in the end would result in small saving should they be centralised. In other words such matters as the problems of national staff wage negotiations, overall control over finance and investment policies, training and research and the re-organisation of the future size and shape of the industry's system would be resided at the central authority. On the other hand implementation of the general plans in areas or regions, the day-to-day affairs of the area or region, probably short-term planning, and problems which do not involve large capital expenses should be decentralised.

In the Egyptian public enterprises there is no clear direction as to whether there is a tendency towards centralisation or decentralisation of the Public enterprises' activities.

Two examples may be given for this vagueness. In the cotton export and purchasing public enterprise, a tendency towards centralisation of the enterprise's activities, it has been claimed, was due to the failure of the old large number of companies, which fulfilled the same functions, to carry out a uniform policy required in a developing country. The cotton export and purchasing enterprises were previously spread over a large number of mills. As a result of the different policies of these firms, these two functions have been transferred to the newly established Egyptian Cotton Commission.

In other sections of the Egyptian public sector it had been claimed that decentralisation was more appropriate. For example, there was the Egyptian Public Organisation for Contracting and Construction. The main function of this organisation was contracting and construction of enterprises in the whole public sector, establishing of housing and public buildings and of other public utilities. These

functions were afterwards divided between three public organisations. They were the Egyptian Public Organisation for enterprises; for 'housing and public buildings' and for 'utilities'. It has been stated that such decentralisation of activities would foster the development and execution of various housing and public utility projects.

The latter example does not show that there is a tendency towards decentralisation of functions in some Egyptian public enterprises because the division of responsibility between three authorities is not a delegation of functions. Moreover it appears from recent social legislation and the fact that Egypt is a centrally planned country, that a direction towards more centralisation in public enterprises is favourable. Most of the major functions of the whole public sector are resided within the discretion of the Supreme Council of Public Organisations.(9)

Centralisation and decentralisation of functions.

After stating the argument about centralisation or decentralisation of functions, it is necessary to analyse some of the functions to see how far they are

(9) See p.24 in Chapter I.

centralised or decentralised. In examining these functions it should be noted that functions such as planning, industrial relations and research for development may be similar in all public enterprises, but the electricity supply industry has different functions which have to be examined separately. These are generation and main transmission and distribution of electricity.

Planning.

Long and medium-term planning for the whole industry has to be centralised. The central authority in the industry must plan for the allocation of the bulk of funds for investment and manpower for use in the main branches of the whole industry. The central authority must decide upon the parts of these sums to be spent for the establishment of new plants and for large-scale extension of existing plants. The central authority should decide which branches of the industry most require technical reconstruction. These matters need to be decided at the centre and the decisions passed on to lower management levels. In other words, in carrying out a large scale programme of re-equipment and development, such programmes

cannot be carried out without some interference with the free judgement and initiative of local management.

Let us see now why only the central authority can be entrusted with long and medium-term planning.

There are several reasons.

First, it may be only the central authority which can have the data about the available resources of finance, manpower and other factors affecting the industry as a whole. Thus they are able to formulate the most efficient method for the utilisation of these resources for the whole industry.

Secondly, it is vital that a long and medium-term policy programme for several years ahead be decided with the best experts and specialists. Naturally these qualifications are found at the centre.(10)

Thirdly, where standardisation of services is a characteristic of a public enterprise it is essential that long-term planning should be decided at one level. For example, it is true that the electricity supply industry in Britain is divided into areas, but they all produce the same service to consumers. Also the design and construction of

(10) Citrine, Lord. Problems of nationalised industries Public Administration Vol.29 p.321.

all types of power stations, each follow the same lines wherever they are established.

Fourth. Centralised planning is essential when new industries or trades are brought into the public sector. J. Baker states that standardisation of network in the electricity supply industry requires the centralisation of planning. The problem faced the British electricity supply industry just after nationalisation. For example, in London where greater multiplicity of independent undertakings and non-standardised network required centralised planning in the London Area.(11)

However, in practice, long and medium-term planning in most of the British nationalised industries is placed in the central authorities. It is mentioned in Chapter III that the Electricity Council in Britain sets the whole planning for the industry for six years ahead, and similarly the Egyptian Technical Bureau of the U.A.R. Electricity Commission plans for the whole industry.

If long and medium-term planning should be centralised, short-term planning could be carried

(11) Baker, R.J.S. The management of capital projects. London 1962 p.111.

out successfully at lower levels, as they do not need the same technical and financial resources as long or medium-term planning. Moreover some of these small-scale programmes require particular local knowledge which is essential for such programmes to be decentralised, e.g. in the British electricity supply industry, at sub-area level, some planning work takes place. J. Baker remarks that planning at sub-area level seems to have been a result of the progressive building up of planning staff and their acquisition of experience.(12) But it must be noted that short-term planning can only be delegated when the central authority is assured that experiences required are available at the lower level.

Financial control.

Financial control, that is, the estimated capital expenditure, the raising of this capital and the sanction of methods of expenditure are some functions which are fairly centralised in public enterprises. Most of the central authorities in British public enterprises are responsible for the raising of capital required by the whole industry

(12) Ibid. p.14.

for development. For example, the Transport Act of 1953 has reserved general financial control and general control of charges to be made for the railways services in the province of the old Transport Commission.(13)

In the electricity supply industry the 1947 Act empowered the Central Electricity Authority to raise capital for the whole industry by issuing electricity stock or Exchequer Advances or by borrowing temporarily from the banks. After 1956 when borrowing powers had been restricted to Exchequer Advances, they were only authorised by the C.E.A. According to the Herbert Report of the re-organisation of the electricity supply industry, in 1956, which recommended more decentralisation of borrowing money to Area Boards, the 1957 Act departed radically from the 1947 Act. It made all Area Boards financially autonomous. Each Board has to ensure that revenues are not less than sufficient to meet outgoings of the Board properly chargeable to revenue account taking one year with another. But, though Area Boards have been granted by the Act of 1957 a degree of financial autonomy, the

(13) Grunfeld, C. The Transport Act 1953
Political Quarterly 1954 p.45.

financial situation for the whole industry is decided by the Electricity Council. The Electricity Council is responsible for the co-ordination and overall formulation of financial policy and is responsible to the Minister of Power.(14) The important reason for centralised financial control is that public funds are used and Parliament is responsible for controlling these funds. Thus it does seem necessary that the Government should give only the Central Authority the financial control over the whole industry.

But if it is appropriate that general financial control should be centralised, there are also some financial problems which need to be decentralised due to urgent local problems. There should be the right to spend money on local projects. H. Clegg remarks that centralisation of financial control is inadequate for local problems. He says 'in a centralised system the operational manager's authority in expenditure may be absurdly limited. All the superior stages rightly want information before they make decisions and the

(14) Panniket, H.O. The finance of electricity supply, Summer school Electricity Council 1963 p.62.

operational manager may be required to fill in an absurd number of returns. Higher managers rightly wish to let their subordinates know of their decisions and give them some idea of the considerations which swayed them. A large number of documents then starts to flow down. No stage in the hierarchy may be by-passed. A matter that requires the decision of the highest authority will have a long distance to travel both ways before it returns to the point of departure and this means delay.'(15)

In public enterprises managed by Government departments, financial control is centralised in the Treasury Headquarters. This over-centralisation of finance could be criticised as being incompatible with commercial activities of the enterprise concerned. There should be financial autonomy to ensure the efficiency of the enterprise.

In Egypt apart from public enterprises run directly by the Ministry concerned, whose finances are naturally controlled by the Treasury, there are those whose accounts are subjected to the control of the State Audit Department. (16) Also centralised

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- (15) Clegg, H. Industrial Democracy and Nationalisation Oxford 1951 pp. 56 - 57.
 (16) Presidential Decree No. 258 1959 p.57.

financial control is exercised by the Economic Development Organisation of Egypt over its group of affiliated public organisations. This was clearly stated by law No. 20 of 1957. By this law the E.D.O. was to be entrusted with the supervision and control of the affiliated public organisations designated by Presidential Decree, if it is deemed necessary that the capital of these organisations should be directed in conformity with the general economic policy laid down by the E.D.O.

Economists who are in favour of this centralisation of financial control think 'it is the most effective way to achieve social justice, increasing production, raising the standard of living and utilising capital for the promotion of national economy.' (17)

It is true that centralised financial control may be essential in newly established public enterprises, which were formerly operated by a number of companies with different financial policies. But after a period of time, limited decentralisation, as mentioned above, is necessary for enterprises' efficiency.

(17) Egyptian Economic and political review
July 1961 p.24.

However, it may be concluded, as noticed from examples given above that centralised financial control is essential when taking the whole industry as a unit. On the other hand limited decentralisation of this function is important where local conditions are to be taken into account for speedy decisions.

Lastly, an additional point could be mentioned in this respect. That is, financial control may be more difficult to decentralise in public enterprises than in private enterprises. In private enterprises it is possible to carry decentralisation of financial control to the point of dividing a company into a number of profit-making units and assigning to each unit a manager who has the authority to make whatever decisions are necessary to return an adequate profit. In public enterprises, it is true for example, that the electricity supply industry is divided into areas as in Britain or into Departments as in Egypt. But each of these areas or departments should not be considered as an independent profit-making unit, because all areas or departments have a close link with the national policy which is wholly controlled and directed by the central authority.

Industrial relations.

There is much evidence that wages and conditions of employment, in British public enterprises, are mostly decided at the centre. This is, first of all, obvious from the terms of the various nationalisation Acts. In the gas industry, however, though the Gas Council conducts negotiation terms and conditions of employment on a national basis, the Gas Area Boards have the right to negotiate with labour organisations in wage disputes. But, on the whole, central authorities carry the responsibility of this function. The Electricity Council is an example.

There are several reasons why industrial relations are usually considered by the central authority.

First, and most important factor, is that trade unions are organised nationally. So in order to present a united front to union strength it is important that the separate components of enterprises have to act as one body. This will give a powerful influence over negotiation processes. Hynes states that the industry must have a central body to negotiate with the trade

unions' representatives and there is no alternative to considering labour relations in the centre. The drawbacks of this centralisation, as Hynes thinks, are that the worker may feel that trade unions are not practically helpful, and he may feel as remote from that union as from the central board.(18)

Second, as mentioned in the previous chapter (19) demands for wage uniformity for similar grades of workers and employees in different areas of the industry make centralised negotiations necessary. In other words central negotiations on wages and other conditions of employment may give employees and workers a sense of being treated fairly.

Third, if the government has to intervene in wage-disputes, it is practical that the Minister is likely to advise or to be advised only by the central body.

Fourth, centralisation of wage-negotiations may avoid disturbances in the areas of the industry. If wage negotiation is decentralised and assuming that one area has been granted an increase in wages for a particular grade of workers, this will often have an impact on similar or even unrelated grades

(18) Hynes. Nationalisation in practice London 1953
p.327.

(19) See p. 362

in other areas. Thus it is essential for this function to be carried out by staff who are acquainted with conditions of all areas. C.G. Hancock states that the major problem in local settlements is the close link between different areas. This will result in a chain effect on local settlements in other areas. He goes on to say that the chance of a purely local settlement which takes into account just the people concerned and local circumstances becomes impossible.(20) The impossibility of local settlements is, of course, against the principle of the differences in cost of living between areas which should be taken into account. The difficulty of local settlement of wages disputes may arise from the conflict between the trade unions headquarters and the branch in the area. Such conflict may strengthen the conception of the centralisation of wage negotiations.

A point for the decentralisation of wage negotiation is that sometimes there are sudden changes in workers' demands which require quick decision by top management, otherwise walkouts in

(20) Hancock, C.G. Trends in Industrial relations
Summer school, Electricity Council 1963 p.38.

the industry will occur. If the wage-negotiation function is decentralised, i.e. if personnel managers at the lower level have the freedom to deal with this function, repercussions of sudden changes would be avoided. The awaiting of decisions from the top level in such circumstances and consequently the delay in taking firm decisions would certainly complicate the problem. It may be claimed that these circumstances are not frequent; and so wage negotiations should be centralised.

Conditions of employment other than wages may be decentralised in a limited form. This means that, for example, the Electricity Council makes the long-term plans for education and training for the whole industry, and it would be the responsibility of the Area Boards to implement these plans and perhaps to make the necessary modifications according to their local circumstances. Internal welfare for employees and workers should be wholly decentralised, assuming that this function does not require a large capital.

The industrial relations functions include several activities other than those stated above. However, it may be said, that as a rule industrial

relations problems which affect the whole industry, such as wage negotiations, should be centralised, and conditions of employment which are obviously related to local circumstances and do not involve heavy capital requirements should be decentralised.

Let us now turn to some of the technical functions of the Electricity supply industry to see how far they are centralised or decentralised.

Generation and main transmission and distribution of electricity.

As far as generation is concerned the question is whether it is to be centralised in one authority of the whole industry or whether to give Area Boards, in Britain, full freedom to generate electricity.

The functions related to the generation side in the electricity supply industry can be broadly divided into, first, the general planning and construction of power stations, second, the applications of this general policy and the detailed work concerning the process of generation. With regard to the former function, and before the re-organisation of the British Electricity supply industry in 1957, the Central Authority's Headquarters

were concerned with the over-all planning, general co-ordination, basic design and some detailed design.(21) The Herbert Report on the re-organisation of the industry, 1956, recommended the centralisation of general planning and construction of power stations within the authority of the Central Electricity Generating Board. The Report states that the responsibility of the Generating Board should be concerned with (a) system load control, (b) planning the general development of power supply (c) the siting of stations (d) the design and possibly the construction of stations of advanced design including nuclear stations (e) planning the super-grid and main transmission.(22)

As mentioned above these functions as a part of the long and medium term planning for the whole industry could be desirably centralised. The other function, i.e. the application of the general policy and the detailed work concerning generation, was, in fact, decentralised in the old organisation of the industry. This is obvious from the setting up of the fourteen Generating Divisions. Each

(21) B.E.A. First Report and statement of accounts, 1948 para 127.

(22) Op.Cit. para 264 & 79.

Division was under the charge of a Divisional Controller who had a great measure of personal authority and responsibility for construction, operation and administration of the generating stations and main transmission system of his Division. This is clear from the first Report on the industry. The Report states 'in planning their administrative arrangements the Central Authority had to decide what measure of decentralisation was desirable and practicable, when, at vesting day, the generating stations and the Grid came under their single operation.' The Report observed that there appeared to be considerable advantages in having operational units for generation and main transmission which corresponded territorially to the Area Boards.(23) The Herbert Committee recommended more decentralisation of the detailed work of the design and construction of power stations and the main transmission system. The Committee emphasised the need for complete freedom to Divisional Controllers without the need for external support. The Committee state that the maximum power and responsibility should be delegated

(23) B.E.A., First Report, 1949 para 77.

responsible to the Generating Board. In other words, as a conception towards decentralisation Area Boards would be free to generate electricity.

The delegation of the generation function to the Area Boards is criticised by the Herbert Committee except in unusual circumstances. The criticism is based on the grounds that there are no important economies to be secured by giving the Area Boards the task of actually operating the generating stations on behalf of the Generating Board. The economies in bulk could be achieved by the centralisation of generation. This would result in a cheaper supply than if Area Boards were to produce their own electricity. In unusual circumstances decentralisation of generation could be a cheaper method. There are five conditions for this, (a) if the bulk supply price offered by the Generating Authority were higher than the cost of generation in the Area. (b) A combination of distribution and generation by the Area Board may provide real economics of scale. (c) If the Area Board is able to use more modernised plants than the Generating Board is willing to provide. (d) 'If small-scale electricity generation could be coupled

with the sale of power stations' heat, thus securing high thermal efficiency." (e) If Area Boards want to be independent in carrying out the responsibility of generation even when the economics are against them. Point 'd' is regarded as important because 'as bulk generation moves towards larger and larger stations, it is increasingly unlikely that these stations will be located in such places that use can be made of much of their heat. Yet a small station with a low efficiency in terms of electricity but which is able to sell its heat will have a higher thermal efficiency than the largest station which generates electricity only.(26)

Delegation of the generation function to Area Boards in these exceptional cases should be limited in the sense that giving Area Boards the power to generate should be used subject to approval of the particular scheme.(27) This is a second conclusion.

E. Thompson regards the unusual conditions of giving Area Boards freedom to generate, as they

(26) Op.Cit. para 236.

(27) Ibid. para 238.

could hardly ever use the powers granted. He says 'this is surely sacrificing the economics of scale to the ideology of decentralisation. At best it is a rather empty gesture.'(28)

In fact, it could not be understood from the Herbert Report's recommendations that they are in favour of decentralised generation in the Area Boards. The constitution of a separate authority (C.E.G.B.) to undertake the function of generation does not mean that this function is decentralised, because it is operated by one authority and is not delegated to Area Boards. The Herbert Report makes it clear that 'the centralisation of responsibility of generation and transmission under nationalisation enabled substantial gains in efficiency to be made.(29)

While centralisation of generation is desirable, it is essential that distribution of electricity be decentralised. By decentralisation of distribution it is meant that Area Boards should have complete freedom in operating the networks in the Area served. More decentralisation could be

(28) Thompson, E. Allen. The organisation of two nationalised industries. Fleck versus Herbert Scottish Journal of Political Economy June 1957 p.97.

(29) Op.Cit. para 98.

achieved by delegating the function to other lower levels such as Sub-areas and Districts.

Decentralisation of distribution is practicable because each Area has its load characteristics which may be very different from other areas. In this case local knowledge required necessitates the decentralisation of this function. Also the close connection between consumers and areas is obviously much greater than with the centre which requires local decisions, to ensure the fullest flexibility to meet local needs.

Perhaps the main obstacle in delegating this function to the possible lower level is the lack of sufficient technical talent.

Advantages and disadvantages of centralisation and decentralisation.

Apart from the relative advantages and disadvantages of either centralisation or decentralisation of functions given above, there are some general advantages and disadvantages of the two concepts. The advocates of centralisation consider that the concentration of functions to be decided at the top would enable the industry to achieve an effective co-ordination of activities

because decisions regarding these functions are taken by experienced men at the top.

The obvious criticism of this advantage is that there must be a limit to the extent to which a few people can be aware of all factors connected with the problems they have to cope with. It is unlikely that small groups of people could know enough about the different problems occurring in the various areas of the industry. For example, in the British electricity supply industry, it is not expected that the Electricity Council, where the Area Boards' Chairmen are sitting, can be aware of all problems of Sub-areas and Districts. In addition it is known that the electricity supply industry must face competition with other fuel industries such as gas. In such circumstances it seems impossible that few people at the top could manage the affairs of the whole industry in a competitive market. The main idea here is based on the belief that the centre must have a lack of knowledge about local problems. Thus where local knowledge is required there must be a greater degree of decentralisation of functions to face the need for speedy decisions adapted to varying local

conditions. These local conditions are numerous, for example, the employment of personnel, the purchase of equipment to meet unexpected peak loads or consumers complaints. Another criticism against giving the power - to operate most of the functions in the industry - to a few people at the top is that such centralisation would frustrate individual initiative. This is, in fact, the inherent objection to centralisation. In this context H. Clegg states that the subordinate manager may be a man who is content to be well paid, but if he has illusions about managing he will be unhappy.(30) And if centralisation is justified by the fear of mistakes made by lower management, it may be argued that it would be useful to leave local managers to make their mistakes. This would train them for higher management levels and it would introduce a degree of emulation between local managers. The Herbert Committee found that most of the Area Boards felt strongly that they were subject to too much interference from the Central Authority,(31) and the position of Divisional Controller in the

(30) Clegg, H.A. Industrial Democracy and nationalisation Oxford 1957 p.54.

(31) Op.Cit. para 230.

organisational structure was considered to be similarly unsatisfactory.(32) In another place the Committee praised the sense of personal responsibility and pride which existed under the 'old system' and blamed the new system of large-scale enterprise for lessening the enthusiasm of District Managers. Accordingly they suggested that District Managers should be freed from direct control and given the fullest responsibility for all necessary service.(33) This would include the introduction of some kind of financial yardstick such as the normal profit and loss account which provides for measuring the success of their units. A certain degree of financial autonomy in, for example, the Area level is the most important feature of practical decentralisation.

In contrast with the British electricity industry, Department managers in the Egyptian industry are less free in their expenditure.(34) To encourage individual initiative of managers of

(32) Ibid. para 239, 287 (a) 265, 501.

(33) para 266, 288, 275, 297.

(34) Special Report on the work of the C.E.G.A. departments, unpublished data Cairo (in Arabic).

the Egyptian Electricity supply Departments one may suggest the provision of freedom in some or all of the following fields:

(i) freedom to receive and retain operating revenues, (ii) freedom from central purchasing or contracting requirements (iii) freedom from general restriction particularly in the field of capital expenditure, and (iv) freedom to borrow money (within more limits) to control the decentralised planning in the area served.

The practical step which may be taken to implement the points suggested above is that the Government should give the enterprise complete or relative freedom from the executive function of the Government, the financial and budget departments of the Government, the Government personnel and planning agencies, the Government accounting and auditing agencies, which may be considered as most important, and from some of the legislation. These freedoms would certainly encourage Department Managers and make them more productive.

Another criticism against the ideology of centralisation, as mentioned early in this chapter is that the top level could be involved in too

many routine matters. By this they limit the extent to which they can be free to plan and to introduce innovation. In brief it is a loss of time.

Finally, over-centralisation would result in some uneconomic consequences. For example, if the functions which have to be decentralised because they deal with consumers close to the lower level, are differently centralised, the consumers will complain about the delay of services. In a relatively competitive market the bad consequences of such centralisation will be to make other competitive industries quick to take advantage of the situation. Similarly employees and workers may also complain and unions may take action resulting in strikes which have uneconomic results in a public utility corporation.

If decentralisation is the remedy for the disadvantages of centralisation thus it is important to show the advantages of decentralisation. In fact, the ideology of decentralisation becomes increasingly important as the enterprises grow up. Many of the modern organisations, private and public, are convinced that certain functions should

be delegated as far as operating conditions may permit.

Some of the general advantages of decentralisation of functions may be summed up in the following:

- (i) As mentioned before, extensive delegation of functions to lower levels of management would leave senior personnel freer to plan and assess their external environment so that more time could be spent on long-range planning and matters of strategy.
- (ii) Decentralisation is effective for geographically widespread organisations and for situations where specialised or local knowledge is important.
- (iii) More flexibility in handling the industry's activities can result from more freedom given to junior people. They can take prompt decisions without awaiting the approval of the action from the central level.
- (iv) Decentralisation would increase initiation and development of lower managers. By increasing their authority and responsibility they will have more personal pride in their work. This will eventually allow them after

being expert, for promotion to positions in the top executive level.

Decentralisation of functions may also have some disadvantages which would be overcome by centralisation. For example, sometimes more decentralisation may harm the economy of the whole country. For instance, assuming that we have completely independent Area Boards in the electricity supply industry, each having its own legislation. This would result in a conflict between Area Boards which in the end is against the public interest. Even where legislation is similar in all Area Boards but where they are free from practical control by a central authority, it may result in uneconomic consequences. The British Gas industry which is constituted of twelve Area Boards gives such an example, where shortcomings of decentralisation made the Select Committee on Nationalised Industries in 1961 suggest the establishment of a thirteenth board. The Report stated that the present structure of the industry was not suitable for developing and establishing large-scale production and distribution facilities. This was due to the practical difficulty of getting

a number of independent chairmen to cope with the lead of the Gas Council of limited power. The economics of scale resultant from the establishment of a thirteenth board would produce gas more cheaply. This board, similar to the Generating Board of the electricity supply industry would store and sell to all or some Area Gas Boards the required gas supply.(36) The Committee stated that the thirteenth Board would be able to offer more positive lead to the industry in developing and undertaking large new projects resulting in a cheaper supply of gas. Finally, they concluded that there was a need for the interdependence of the Area Boards and not for their independence of the Gas Council.

Another disadvantage of decentralisation is that there is a desire for national uniformity of prices and wages. Decentralisation of these two functions may result in anomalies and differences. Lastly, there is a human tendency to resist change and to delegate functions to lower levels of management. Some of the senior personnel holding important activities do not like these activities

(36) Report from the Committee on Nationalised industries, the Gas industry, H.C. 280 July 1961, Report para 467.

to be scattered and some do not want others to do the work they were doing before.

To overcome the difficulties of decentralisation, centralisation is the remedy. Advantages of centralisation may be illustrated by examples of the situation in some of the nationalised industries before and after nationalisation. When coal, railways and electricity supply consisted of a large number of undertakings, each with an independent management, there was an absence of any central organisation to plan and carry out future development and modernisation of the industry concerned. There was no central agency responsible for capital investment, research, the maintenance of labour force and other matters of fundamental importance to the industry. With regard to the electricity supply industry, there was a chaotic position of generation and transmission before nationalisation. Hundreds of municipal and commercial undertakings existed to generate, transmit and distribute electricity and there was an immense diversity of voltage types or current. W. Robson remarks 'in a great city like London there was a veritable jungle of tiny overlapping jurisdiction.(37)

(37) Robson, W. Nationalised industry and public ownership p.113.

It is true that, as mentioned above, technical operation of the electricity supply, i.e. generation and main transmission should be at least supervised by a central authority.

To sum up the discussion, it seems to be difficult to give a definite answer about whether centralisation or decentralisation would be the best method. But when specific functions are under examination, the philosophy or principle of decentralisation seems to be a goal rather than a description of current practice. On the other hand, if the responsibility for the conduct of an industry is placed upon a central body there are limits to the extent to which functions centralised can be delegated without fear of incurring undesirable and serious consequences.(38) Thus a compromise between the two methods of management should be at least formed through lines of communication.

Lines of communication.

A connection between the various levels of management may be understood as the relation

(38) Citrine, Lord. Problems of Nationalised industries Public administration Vol. 29 1951 p.321.

between the top level of management and other lower levels through a vertical tube. But lines of communication are also meant to be, in addition, horizontal in character.

There are some qualifications for the principle of 'lines of communication' in order to get successful results.

First, a clear definition of the term decentralisation and the way of delegation. Functions delegated must be known by the two ends of the line. Clear instructions from the top to the lower levels are necessary. Second, there must be some kind of consultation, say between the central authority and Area Boards' Chairmen, before the function has to be centralised or decentralised. The Fleck Report on the coal industry recommended the setting up of a National Advisory Committee for this purpose.

Third, delegation of functions can work well if there are sufficient staff to get the work done. Also a sense of common purpose is essential in order to avoid any conflicts.

Fourth, a successful line of communication could be achieved if the Central Authority appreciates

the special circumstances surrounding the Area where instructions are carried out. Any rigid definition of central decisions is working against the principle.

In the British Electricity Supply Industry an effective relationship between the central authority and other levels of management can be seen in the First Report of the B.E.A. which states 'the general operational and development policy and planning' are determined by Authority Headquarters, but at regular conferences of the Divisional Controllers and the full-time members and Chief Officers and by other contacts and communication, the Controllers are closely associated with the formulation of policy and plan in the execution of which they necessarily play as large a part. Where it is desirable to establish a common practice throughout the Divisions, Headquarters issue instructions accordingly after consultation with the Controllers. The Departmental officers at Authority Headquarters maintain functional contact with the corresponding Officers in the Divisions.(39) Such a vertical

(39) B.E.A. First Report 1948 para 79.

communication between Headquarters at the top and Area Boards or Divisions would realise the aim of the central authority in delegating function in a successful procedure.

Horizontal communications are also necessary in the same level of management. This means that Departments in one level must work together towards the same objective of the industry. This could be achieved through informal contacts. Officials from different Departments can meet in non-working hours at lunch times in the canteen.

By this simple outline relationships between different levels could be formed, and hence the principle of lines of communication can work well. But why are centralised functions, if they were to be delegated not properly carried out by lower levels of management? The main reasons are; the difficulty junior managers have in adjusting themselves to new conditions once a function is found to be preferably decentralised. Lower management levels may be ill staffed, thus it would be difficult to implement economic decisions taken by specialists at the centre. For example, if Area Boards are not efficient in adopting methods of research

experimented at the centre. In addition, it may happen that the top levels of management are not insisting that their policies be carried out. The Fleck Report on the coal industry found unwillingness among the top management to insist on their policies being carried out. The Report remarks that from the outset the Board (centre) has tried to control their subordinates with a very light touch. Some Divisions have taken advantage of this.(40) H. Clegg agrees with the Fleck Report, stating that the organisation would work well if instructions and frame of policies are ensured to be carried out. For this the Central Board should narrow its field to supervise effectively functions delegated.(41)

(40) N.C.B. Report of the Advisory Committee on Organisation Feb. 1955 para 298, 318.

(41) Clegg, H.D. The Fleck Report. Public Administration Vol. 33 1955 pp. 244 - 5.

Conclusion.

An attempt has been made in this chapter to give an outline of the problems of centralisation and decentralisation of public enterprises' activities and particularly in the electricity supply industry. It was made clear that the definition of the two terms centralisation and decentralisation has to be precise. It is thought that if we relate the definition only to functions of the industry concerned, i.e. if we say that a certain function is centralised when it is decided at the top or decentralised when it is carried out at a lower level we will avoid the confusion of other definitions.

Decentralisation of functions is not only to relieve the top level by passing some functions to lower levels, but decentralisation may take three forms. Complete decentralisation i.e. to delegate full responsibilities to lower levels, or limited decentralisation, i.e. to delegate certain functions, or personnel decentralisation, i.e. to delegate particular function to a certain individual. Limited decentralisation proved to be the appropriate method in the British electricity supply industry. The

whole argument about centralisation or decentralisation of functions arose because of a tendency towards more decentralisation in the British public enterprises. In Egypt the evidence shows that a tendency to centralise more functions, either in Government Departments or public organisations, is at work. The main reason for this phenomenon is that most of the Egyptian public enterprises are newly established and there must be a certain degree of centralisation of function to cope with the general plan in the whole economy.

When deciding whether functions should be centralised or decentralised, the discussion may demonstrate that within one function centralisation may be desirable in one part and decentralisation in another part of the same function as is shown in planning, financial control and industrial relations.

With regard to the electricity supply industry it is concluded that generation and main transmission should be controlled by the Central Authority. Distribution of electricity, where local problems make up the greater part of the function, should be decentralised.

Of course, there are special advantages or disadvantages in the centralisation or decentralisation of a particular function, but there are also some general advantages and disadvantages of the two methods. It is difficult to say whether the advantages of centralisation outweigh the advantages of decentralisation or vice versa. What is important is to have a successful line of communication between various levels in the industry vertically as well as good relations between employees and workers in the same level i.e. horizontally. If lines of communication work well it would certainly lessen the disadvantages of either centralisation or decentralisation of functions. The main factor in a successful compromise between the two methods, centralisation and decentralisation, is that all levels in the industry and if possible all important departments on the same level, should know clearly why functions are centralised or decentralised.

GENERAL CONCLUSIONS..

The investigation of the managerial and economic problems of public enterprises in Britain and Egypt, shows that the state takes over an industry when it is suffering from bad management, technological backwardness, a shortage of able executives and technical experts or capital starvation.

While the British Government took some measures to control essential industries in the country in the middle forties, in Egypt these measures were not so effective until 1956. In the present organisational structure of public enterprises in Britain and Egypt there are some similarities as well as differences. Some Egyptian public enterprises are governed by public boards more or less similar to the British public corporation. The E.D.O., the El Nasr Organisation and Misr Organisation are examples.

With regard to the electricity supply industry, it is governed in Egypt by Government Departments but in Britain it is managed by public corporations.

It is the author's opinion that, in order to satisfy the aims of supplying electric power to various consumers on commercial terms as well as in the national interest, it may be useful to modify the present Egyptian structure on similar lines to that of the British system. This will ensure the business flexibility aimed at by the public corporation's device. It is well known that the public corporation is by far the best organ so far devised for administering public undertakings. "It is far better than the joint stock company owned and controlled by the State, or than Government Departments engaged in business activity."(1)

The establishment of autonomous Area Boards instead of Government Departments may have useful economic results. It is true that Government Departments Officials, ordered by binding instructions, cannot ensure the business flexibility necessary for the major industries in the economy.

As a consequence of this proposed re-organisation, the structure of the Boards would

(1) Robson, W. Nationalised industry and public ownership London 1962 p.493.

have to be reconstituted. Board's members should be selected, either full-time or part-time, on qualification basis without regard to their ideological views. Though the author agrees with the British system in matters concerning the procedures of appointment, the qualifications and other problems of the Boards' members, the idea of either direct representation of the workers on the Boards or the appointment of ex-trade union officials should have further consideration. It may be useful to appoint those who show a particular interest in the problems of industrial relations providing that workers would be satisfied with such appointment.

From the study of economic planning in the electricity supply industry, it was made clear that the main aim is to raise consumption per capita. In a comparison between Britain and Egypt, the evidence shows that the whole consumption as well as consumption per capita are much higher in Britain than in Egypt. This is, of course, a natural result in a comparison between a developed and under-developed countries. But it is interesting to note that the average annual rate of

increase in electricity production in Egypt is higher than in Britain during the period of 1958 to 1964. That is because of the comprehensive industrial schemes and the new establishment of a large number of generating units. As a result the average annual increase in consumption per capita in Egypt proceeds at a reasonable rate.

Consumption of electricity between various classes of consumers in Egypt is not balanced. The industrial sector consumes most of the supply. It is true that this is essential in a newly developing country, but more effective measures should be taken to increase the average annual growth of consumption of other categories especially domestic and agriculture. Towards the planning for the industry's future two main problems need to be taken into account., i.e. manpower and financial requirements. With regard to manpower planning the problems involved are the providing of the necessary skill and the training of the employees. It is shown in the study that skills required in Egyptian public enterprises and in the electricity supply industry could be provided by specific training schemes somewhat similar to that adopted

in the British electricity supply industry but with necessary modifications such as the concentration on the job training method for workers, and the national education sessions for middle men. One aim of such planning is to raise productivity per man in the industry. Though it is true that comparison of productivity per man in the electricity supply industry is difficult, the indications are that productivity per man in the Egyptian industry is lower than in Britain owing to the defects of the socio-economic structure in the country.

Financial requirements are provided in British public enterprises by three sources; the market, the Exchequer and by the industry's surpluses. Borrowing from the market was rightly abandoned by the British authorities, because it was proved that nationalised industries should not compete in the market. The main reason is the fact that they held a monopolistic position would enable them to offer a high rate of interest which would be passed to the consumer. The ratio of self financing in public enterprises should depend on the economic situation of the industry, such

as the rate of growth. It is correct that financial requirement should be drawn from the Exchequer as is now the practice. In Egypt the study shows that some public enterprises and particularly the electricity supply industry depend much on foreign loans and ^a ~~the~~ high proportion of self-financing. This is a result of the small proportion of national savings. One of the projects which raises a particular difficulty in financing, is rural electrification. It is true that in Britain rural consumers should contribute in providing the capital required, while in Egypt the taxpayer and particularly urban population should contribute in providing the capital for rural electrification. Once the capital is provided it is necessary to carry out a correct investment policy. The problem of the electricity supply industry, in this respect, is to choose the best method of generation. The study shows that hydro-electric projects in Egypt should be implemented prior to other plants. The High-Dam project, for instance, should not be substituted by equivalent thermal plants. This would ensure the economic utilization of natural resources.

If the appropriate method of generation is chosen, the cost per KWh will be at a minimum and consequently the price charged to consumers would be the lowest possible. This result cannot be attained without a correct price policy. It is of interest to note that pricing policies in the electricity supply industry in Britain and Egypt are widely different. This is clearly shown from the tariff structure in each country. The main criticism in the British system is the application of a uniform tariff which is also a national trend in Egypt. This is mainly because ^{of} uniform tariff does not take into account the differences in the economic position of each area in the country. In the controversy of average-marginal cost/pricing, it appears to be difficult to select one or another, but the method of charging a price equal to marginal cost at off-peak times and a price equal to average cost of supply at peak times needs further studies. In practice pricing policies in a public enterprise, such as the electricity supply, are not based on purely economic principles, because of Government intervention in the national interest.

While in Britain Government interest in pricing policies has frequently appeared, in wages policies the Government role is described by being moderate.

However, as in prices, the structure of wages does not depend on purely economic principles. Social factors, comparability of wages between different regions of the industry and among the whole public sector have considerable effect on wages policies in Britain. It is not desirable to have more Government intervention in wage policies. But in some cases it seems necessary that the Government role should be increased to keep wage claims in line with productivity, thus reducing the pressure of inflation.

The last problem investigated in this study is centralisation and decentralisation. It is felt in discussing this problem that much of its complexity arises from different definitions. It is suggested that the term centralisation or decentralisation should be defined in relation to functions of the industry concerned. To illustrate this definition some functions have been investigated and it was shown that in most of these

functions parts of them should be centralised and others should be decentralised. Taking the whole industry as a unit, it is essential to have lines of communications between all levels in the industry and between the departments on the same level. This would result in a successful compromise between the two methods of centralisation and decentralisation.

Lastly, as public enterprises are usually very large, organisational and managerial problems are almost of unique kind. It is not possible in every case to find the best solution for these problems. Also the fact that the ^{Boards} ~~running~~ of industries are in any case answerable to Parliament, directly supervised by a Minister and severely criticised by the press if something goes wrong, ~~these factors~~ add more difficulties to the administration of public enterprises.

This study is a contribution to solve public enterprises' problems with particular reference to the electricity supply industry.

APPENDIX I.

From the brief information received the new structure of the Egyptian electricity supply industry is as follows:

A Ministry of Electric Power has been created in March, 1964, to supervise and control the following Organisations:

1. The General Commission of the Electrification of the U.A.R.

It is exactly the U.A.R. Electricity Commission investigated Chapter I. Its functions are briefly:

- (a) planning and provision of new projects and to carry out research for the whole industry.
- (b) responsible for the general budget and its finances.
- (c) the decisions of price policy and the tariff structure.

2. Egyptian Organisation for the implementation of Electricity Projects.

Its main function is to execute the planned projects which were carried out by foreign agencies.

3. Egyptian Organisation for Generation and Transmission.

Its main function is the management of all electricity power stations and H.V. general networks.

4. Egyptian Organisation of Electricity Distribution.

Its main function is to control various authorities supplying electricity to consumers. Also the repair and maintenance of the distribution networks and the execution of low voltage schemes and rural electrification projects.(42)

APPENDIX II.

Law No. 20 1957 Amended by Law No. 138 1957 relating to the Economic Organisation.

Article 1.

A general organisation named the 'Economic Organisation' will be established. It will be a legal body and will be attached to the Presidency of the Republic.

Article 2.

The capital of the said foundation will be composed of:

- (a) The share of the Government in the capital of the joint stock companies.
- (b) Capital of public establishments whose objectives are the practising of commercial, industrial, agricultural or land activities whose definition has been determined by a decision of the President of the Republic. The capital may be increased by a decision of the President of the Republic.

Article 3.

Objectives of the establishment:

- (a) Development of national economy through commercial, industrial, agricultural and financial activities.

- (b) Laying down the policy of investing the funds of the organisation and directing them to the organisation referred to in Article 2 above.
- (c) Acting for the Government in guiding and supervising other public establishments formed by decision of the President of the Republic on behalf of the welfare of the national economy. Planning the necessary programmes for regulating Government participation as well as that of public and private organisation in this activity.

Article 4.

This organisation on behalf of these objects may use every necessary means to secure them, in particular through:

- (a) The establishment of commercial, financial, industrial, agricultural or land companies.
- (b) The increase or reduction of funds invested in projects without prejudice to the rights and guarantees given by laws in which it participates.
- (c) The appropriation of stocks and shares through purchase or subscription.

- (d) The contracting of loans with Government, banks foreign Governments and organisations and international establishments. The issuing of stocks in Egypt or abroad with a view to financing its projects.
- (e) Granting loans to companies sharing in its capital, guaranteeing them for loans, contracting loans and issuing stocks and shares, these are to be determined by decision of the President of the Republic.

Article 5.

The organisation has the right to form joint stock companies alone without other partners and the shares of such companies may be put into circulation directly after their establishment.

Article 6.

The Economic Organisation shall have representatives on the board of directors of the companies in whose capital it has shares. The number of such representatives is determined by and should be less than the proportion of the foundation share in the capital, it being stipulated that in all cases the Establishment must have at least one representative on the board of directors

of companies in whose capital its shares are no less than 25%. The representatives of the Organisation on the board of directors shall have the same rights and authority as those of the other members of the board. They have the right also to submit to the board of directors and the General Assembly any suggestions or advice relating to the management of the affairs of the company.

Article 7.

The representatives of the Organisation on the board of directors and the general assembly of companies should acquaint the President of the Board of the Organisation with the decision issued by such boards and assemblies within three days from date of their issue.

Article 8.

If the share of the Organisation in the capital of any company is not less than 25% the President of its Board shall have the right to request the reconsideration of every decision issued by the Board or the General Assembly of such companies within a week from the date of notification otherwise the decision will be considered valid unless it is passed by the Board

or the General Assembly as the case may be by a majority of at least two thirds of the vote.

Article 9.

The representatives of the Economic Organisation in the General Assembly of the companies shall not participate in the election of the members of the Board who represent private capital.

Article 10.

The representatives of the Economic Organisation on the Board of Directors of companies shall not be obliged to offer guarantee shares for their membership.

Article 11.

The sums due to the representative of the Economic Organisation on the Board of Directors of companies shall be the property of the Economic Organisation, in whatever form these sums may be. It is the Organisation itself that determines the salaries or the remunerations that are to be paid by its treasury to its representatives. The assets of the Organisations are considered private funds except those that are considered of public utility by a decision by the President of the Republic or by their status.

Article 12.

The nomination of the President of the board or the managing director or the director general in the companies in whose capital the Establishment shares by at least 25%, shall be done through a decision by the President of the Republic from among three candidates chosen by the board of the company after taking the opinion of the Board of the Organisation. In the event of the absence of the President of the board or the managing director he will be replaced temporarily by one of the representatives of the Organisation of the Board.

Article 13.

The Economic Organisation shall have a representative on each of the boards of public organisations when the Economic Organisation directs their activities in accordance with the provisions of Article 6. The representatives of the Economic Organisation shall have rights and authority as those of the other members of the board. They shall have the right to offer to the board directions relating to the public affairs of the Establishment. The representative of the

Economic Organisation must notify the president of the board of the decisions taken by the board of the Organisation in the board of which the Economic Organisation shares membership within three days from the decision. The President of the board of the Economic Organisation shall have the right to object to the decisions of the said organisation within one week from date of notification failing which the decision is considered valid. In the case of any objection to the decisions it shall not be valid, unless it is passed by the board by a majority of two-thirds of the vote at least. This without prejudice to the rules regulating the work of those public establishments.

Article 14.

The Board of the Organisation shall be composed of a number of members whose number and salaries and nomination shall be by a decision of the President of the Republic.

The President and the members of the Board of the Organisation should fulfill the following conditions:

- (a) They shall be Egyptian by birth.
- (b) They shall not have particular interest in

any of the companies in which the Organisation is sharing.

- (c) They must enjoy their civil and political rights.

Article 15.

The meeting of the Board shall be by a summons by its President, and will not be valid unless it be attended by more than half of the members. The decisions are taken by a majority of votes and in cases of parity the side that has the president will gain the decisions. The President of the Board notifies the decisions of the board to the President of the Republic who has the right of cancellation or amendment within one week from the date of notification, otherwise the decision is valid.

Article 16.

The Board of Directors of the Organisation has full right to manage the work of the Organisation and in particular to:

- (a) Practice all activities for managing the funds of the Organisation and to determine the means of investment.

- (b) Contract loans and issue stocks in conformity with the law.
- (c) Choose the representatives of the Organisation in the board of the companies in whose capital it shares and to study the reports submitted by them and to issue the necessary instructions.
- (d) Appoint the officials of the Organisation and determine their salaries and remunerations.

Article 17.

The Board prepares every year a balance sheet and a profits and losses account. It must also prepare a report of the activities of the Organisation during the financial year and of its financial position at the end of the same year.

Article 18.

The Audit Administration take over the checking of the accounts of the Organisation and submits an annual report of the result of auditing to the Board.

Article 19.

The President of the Board of the Organisation will submit to the President of the Republic a report on the activities of the

Organisation at the end of the year. This report will be accompanied by a copy of each of the annual reports and the report of the Audit Administration.

Article 20.

The balance sheet and the profit and losses account are ratified by a decision of the President of the Republic. The net profits of the Organisation are added to the State Treasury after deducting that portion destined for forming a reserve capital for the Organisation or for the establishment of new projects in the development of the national economy or for the support of existing projects.

Article 21.

The President of the Republic issues the statutes of the Organisation which comprise the following:

- (a) The rules and regulations to be followed in managing the Establishment including the financial and accounts rulings which are not bound by the Government regulations in force.
- (b) The form in which the balance sheet of the Organisation and the relative statements are issued.

- (c) The regulations governing the appointment and promotion of officials as well as their remuneration increase of pay and punishment without being bound by the Government rulings in force.

Article 22.

All laws authorising the creation of organisations under the control and supervision of the Economic Organisation by a decision of the President of the Republic are considered valid as those issued by the President himself. They may be cancelled or amended by presidential decision.

(Published in the Official Gazette in No. 5 of 14. 1. 1957.)

APPENDIX III.The Affiliated Companies of the E.D.O.:

<u>Banking</u>	<u>Share of E.D.O.</u>
Bank of Alexandria	100%
Bank du Caire	45.4%
Bank L. Goumberiah	25.2%
Bank de l'Union Commerciale	25.1%
Le Credit Hypothecaire	56.9%
Le Credit Agricole et Co-operative	50%
 <u>Insurance</u>	
The National Insurance Company of Egypt	60.4%
AL MOTTANIDA Insurance Company	100%
The Misr Insurance Company	29%
La Societe AL CHARK pour les Assurances	86.7%
The Cairo Insurance Company	25%
 <u>Industry</u>	
The General Petroleum Company	100%
Societe Egyptienne pour la Raffinage et le commerce du Petrole	49.4%
The Sinai Manganese Company	100%
The Safaga Phosphate Company	100%
Societe Generale d'Ilimenite	100%
The Associated Mines Company	87%
The Mineral Wealth Company	62.23%

The Egyptian Black Sands Company	25%
The General Company for research and ground water	100%
Societe Generale Egyptienne de Material de Chemins de Fer (Semaf)	79.7%
Electric Cable Egypt	52%
The Smelting Company	98.8%
The General Company for land reclamation	100%
Societe pour la construction et les habitations populaires	20%
The General Interior Trade Company	100%
The Misr Foreign Trade Company	55%
The Tractor and Engineering Company	57.4%
The General Company for Pharmaceuticals	100%
Bassili Timber Company	23.7%
Societe Generale pour la navigation maritime	100%
United Arab Airline	51.85%

APPENDIX IV.PRESIDENTIAL DECREE NATIONALISING BANKS
AND INSURANCE COMPANIES IN THE U.A.R.Article 1.

All banks and insurance companies shall be nationalised, and the companies and establishments specified.

Article 4.

Companies and banks referred to in Article 1 shall maintain their legal form and continue their activities and functions. Amalgamation of any of these banks, companies or establishments with another can only take place on the strength of a Republican Decree.

Article 5.

The President of the Republic shall issue a Republican Decree indicating the competent administrative authority that shall be concerned with the supervision of each of the companies or establishments referred to.

Article 6.

The competent administrative authority entrusted with supervision of companies and banks affected by this law shall be authorised to relieve

the managing directors, chairman of the board of directors and some or all members of the board of any of these establishments and appoint a provisional board, a managing director or a delegate having the powers of a board of directors pending the appointment of a new board. As for other establishments referred to, the administrative authority shall be authorised to relieve the director of any of these establishments and appoint another. All decisions by the provisional board, the managing director or the delegate shall not be regarded as final unless appointed by the competent administrative authority.

APPENDIX V.CLASSIFICATION OF THE EGYPTIAN PUBLIC
ENTERPRISES.

In conformity with the Presidential Decree No. 1899/1961 promulgated on the 16th of December, a Supreme Council for Public Organisations was established under the Chairmanship of the President of the Republic with the Vice-President of the Republic and the competent Ministers as members.

According to a list attached to the said Decree, the public business sector is to be grouped in 38 public organisations. Each group of industries, concerned with one economic activity, is supervised by a competent Minister.

I. Minister of Industry.

1. The Egyptian Public Organisation for Mining.
2. The Egyptian Public Organisation for Foodstuffs.
3. The Egyptian Public Organisation for Textiles.
4. The Egyptian Public Organisation for Chemical Industries.
5. The Egyptian Public Organisation for Building Materials and Ceramics.
6. The Egyptian Public Organisation for Metallurgical Industries.

7. The Egyptian Public Organisation for Engineering Industries.
8. The Egyptian Public Organisation for Petroleum.
9. The Egyptian Public Organisation for Co-operative Production and Small Industries.

II. Minister of War.

The Egyptian Public Organisation for the Military Factories.

III. Minister of Agriculture.

The Egyptian Public Organisation for Co-operative Agriculture.

IV. Minister of Communication.

1. The Egyptian Public Organisation for Internal Transport.
2. The Egyptian Public Organisation for Maritime Transport.

V. Minister of Housing and Public Utilities.

1. The Egyptian Public Organisation for Co-operative Housing.
2. The Egyptian Public Organisation for Contracts and Construction.
3. The Egyptian Public Organisation for Public Buildings.
4. The Egyptian Public Organisation for Housing and Reconstruction.

VI. Minister of Agrarian Reform and Land
Reclamation.

1. The Egyptian Public Organisation for Desert
Reclamation.
2. The Egyptian Public Organisation for Land
Development.
3. The Egyptian Public Organisation for Land
Reclamation.

VII. Minister of Labour.

The Egyptian Public Organisation for Social
Insurance.

VIII. Minister of State.

1. The Egyptian Public Organisation for
Broadcasting and Television.
2. The Egyptian Public Organisation for Tourism
and Hotels.
3. The Egyptian Public Organisation for News,
Publicity, Distribution and Printing.

IX. Minister of Supply.

1. The Egyptian Public Organisation for Consumption.
2. The Egyptian Public Co-operative Organisation
for Consumption.
3. The Egyptian Public Organisation for Silos
and Storage.
4. The Egyptian Public Organisation for Fisheries.

X. Minister of Health.

1. The Egyptian Public Organisation for
Pharmaceutical Products, Chemical and Medical
Equipment.

XI. Minister of Economics.

1. The Egyptian Public Organisation for Trade.
2. The Egyptian Public Organisation for Cotton
Trade.
3. The Egyptian Public Organisation for Banks.
4. The Egyptian Public Organisation for Insurance.
5. The Egyptian Public Organisation for Savings.

XII. Minister of Culture and National Guidance.

1. The Egyptian Public Organisation for
Supporting the Film Industry.
2. The Egyptian Public Organisation for
Theatrical and Musical Arts.
3. The Egyptian Public Organisation for
Composition Translation, Printing and
Publication.

XIII. Minister of Public Works.

- The Egyptian Public Organisation for
Electricity (U.A.R. Electricity Commission).

APPENDIX 6.

Organisation Chart of the C.E.G.A.

The Board

General Manager

General Inspector of Electricity

General Inspector of Power Stations

Deputy-General Manager

Deputy-General Manager

General Inspector of Incomes and Expenditures

The 'Administration' Headquarters Main Departments

General Account- ancy Dept.	Employees Dept.	Technical Bureau for General Manager	Commercial Dept.	General Secretaries Dept.	Whole Accounts Dept. for consumers	Cost accountancy & production Dept.	Calculations Machines Dept.	Secretaries Dept. for the Board	Archives Dept.	Statistical & planning Dept.	Legal Dept.
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These Departments are under the direct supervision of the two Deputy-General Managers.

General Inspector of Electricity
Departments in the Headquarters.

Transport Networks projects	Drawing Bureau Technical Bureau for research	Maintenance of main transformers Contracts for large consumers	Controlling Dept. Meters Dept.	Connection & executing Dept. Medium voltage projects	Safety Experimental Laboratories & workshops for transformer's maintenance	Stores & purchases
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Maintenance of
overhead lines
& cables

Maintenance of low voltage networks

Workshops

Building & survey

General Inspector of Power Stations

Departments in Headquarters of C.E.G.A.

Secretaries Dept.	Mechanical Engineers Bureau for projects	Electrical Engineers Bureau for projects	Civil Engineers Bureau for projects	Accountancy Bureau for projects	Drawing Bureau
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Power Station Headquarters is divided into the following Departments

Shift Dept.	Mechanical maintenance	Electrical maintenance	Reports	Chemical Laboratories	Managerial	Maintenance of general character in the Area served	Stores
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General Inspector of Incomes Expenditure

He controls seven branches in Cairo and its suburbs.

Each branch is divided into the following Departments.

Applications for connections	Accountancy	Auditing	Collection	Burse and disconnection	Treasury
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PLAN OF ELECTRIFICATION OF U.A.R.

B. Projects financed by the Power Producing Authority.
(Thousands of pounds)

Name of project	Estimated investment	
	Total	Foreign
<u>Generating stations</u>		
Cairo South generating station (Extension)	4250	2929
Damanhur generating station (Existing)	1250	650.5
Suez generating station	8184	5658
Alexandria generating station (Existing)	3720	2800
Stations for industrial ente prises	4782	3171
	<u>22186</u>	<u>15208.5</u>
<u>High Voltage Networks</u>		
Cairo Area electrification projects 63 kV lines and substations	969	541
Extension of existing substations	400	249
Alexandria Area electrification projects	600	470
	<u>1969</u>	<u>1260</u>
<u>Medium Voltage Systems</u>	4838	2278
<u>Low Voltage Systems</u>		
Extension of diesel-electric stations	6000	3000
<u>Studies & Research</u>		
Electricity-meter laboratory (CEGA)	50	25
<u>Hydro-electric projects</u>		
Aswan generating station	30974	14871
High-Dam generating station & transmission system	107500	63500
	<u>138474</u>	<u>78371</u>
<u>Nuclear projects</u>		
Nuclear generating station	12000	10000
Total	185517	110142.5

APPENDIX 8.AVERAGE COSTS AT THE MAIN POWER STATION IN EGYPT.(1) The Cairo Electricity and Gas Administration.

	Millimes per KWh
Fuel costs	2.6
Average gross cost	5.15

Estimation of the generating costs in the new Cairo-West power stations planned to be commissioned in 1964 are as follows.

At 50% annual load factor.

	Millimes per KWh
Fuel costs	1.7
Total gross costs	2.76

At 80% annual load factor

	Millimes per KWh
Fuel costs	1.66
Total gross costs	2.30

(2) Alexandria Electricity and Gas Organisation.

	Millimes per KWh
Fuel costs	3.0
Average gross costs	5.45

(3) Average costs in the hydro-power stations in Aswan and the estimated costs at the High Dam are less than $1\frac{1}{4}$ millimes.

APPENDIX 9.

TARIFF STRUCTURE IN EGYPTIAN ELECTRICITY AUTHORITIES.

(i) The Cairo Electricity and Gas Administration.

For the purpose of lighting. In this area the normal subscribers are charged for every kilowatt hour the sum of 24 millimes. For other classes such as Governmental consumers, charity societies, public hospitals, religious institutions, orphanages and similar institutions, and sporting clubs, the tariff is 21.6 millimes per kilowatt hour.

For motive power and appliances, the authority classified the consumers into two main categories.

(i) Home appliances or consumers who use electrical equipment apart from Governmental ones, there are two types of tariffs.

(a) Single tariff, for the whole consumption, at any time, the tariff is 14 mms/KWh.

(b) Double tariff; this tariff has two rates varying between day and night. Days rate is 10 mms/KWh. Night rate is 24 mms/KWh. *

(ii) Motive power for Governmental consumers.

The tariff here is a three block one according to the number of hours using electricity, it

* "Day time starts at 11 p.m. and ends at 5 p.m. the following day; night time starts at 5 p.m. and ends 11 p.m. the same night."

differs also between day and night. We can sum it up in the following table.

Day Rate	Mms/KWh	Night Rate	Mms/KWh
First 200 hours	12	First 400 hours	21.6
Following 1800 hours	8.7	Following 600 hours	15.4
Rest of Energy	7.7	Rest of Energy	8.7

Secondly; the Authority designed a tariff with two types according to the consumer's capacity: first consumers with installed capacity less than 500 K.W. There are again three types.

(a) Consumers whose consumption is less than 10,000 KWh. per year. It is a four block type according to the number of hours utilised at day time per year and three block type at night time. It can be thus shown in a table:

Consumption less than 10,000 KWh per year.

Day Consumption	Mms/KWh	Night Consumption	Mms/KWh
First 200 hours	16	First 400 hours	24
Following 800 hours	11.6	Following 600 hours	19.2
Next 1000 hours	9.6	Rest of Energy	11.6
Rest of Energy	7.7		

"Power factor is usually 0.8, but it is subject to any change by the authority."

Consumption less than 1000 hours and more than
200 hours per year.

"Block tariff related to load factor."

This type of tariff is designed to the different consumption at day time and night time. The day time is divided between the first 200 hours utilised and the rest of the 1000 hours. At night time it is assumed that the consumer at any particular grade of capacity will be charged for the whole 1000 hours even if he is not, but the difference here is between summer and winter, as shown in the next table.

Consumption less than 1000 hours and more than
200 hours per year.

Capacity K.W.	Day		Night	
	200 hours	Rest	Winter	Summer
10-13	16	7.9	24	16
14-19	16	7	24	16
20-26	15	6.2	24	15
27-37	14	5.5	24	14
38-51	13	4.9	24	13
52-72	12	4.5	24	12
73-100	11	4.2	24	11
101 & above	10	3.9	24	10

CONSUMERS WITH CONSUMPTION OF MORE THAN 1000 HOURS PER YEAR.

Capacity K.W.	Day			Night		
	Millim/K.W.h.			Millim/K.W.h.		
	200 hours	800 hours	1000 hours	Winter		Summer
				5 p.m.-8	8 p.m.-11	5 p.m.-11 p.m.
4- 5	16	11.6	5	24	24	16
5.5- 7	14	11	4.4	24	24	14
7.5- 9	12	9	4.2	24	24	12
10 - 13	10	7.9	4	20	20	10
14 - 19	8.5	7	3.8	20	20	8.5
20 - 26	7.7	6.2	3.6	20	20	7.7
27 - 37	7	5.5	3.5	20	20	7
38 - 51	6.7	4.9	3.5	20	6.7	6.7
52 - 72	6.3	4.5	3.5	20	6.3	6.3
73 - 100	5.9	4.2	3.5	20	5.9	5.9
100 & over	5.8	3.9	3.5	20	5.8	5.8

The differences between this type of tariff and the later are:

- (a) The capacity started from 4 K.W.
- (b) Day time divided in three blocks.
- (c) Night time in winter is divided between two periods: the first period from 5 p.m. to 8 p.m. which is defined as the peak time, the second period between 8 p.m. to 11 p.m.
- (d) In summer at night times the tariff is similar to that of the first block at day times; also in winter at night from 8 p.m. to 11 p.m. started from capacity 38 K.W. to 101 and above.

Consumers for maximum demand more than 500 K.W.

"Big consumer tariff" as it is called. These consumers are charged a two-part tariff.

(a) Fixed annual charge of £E 3 per contracted K.W.

(b) Step tariff: *

First 750 utilization hours at 4.8+3.4 Mms/KWh
 following 250 utilization hours at 2.8+3.4 Mms/KWh
 following 500 utilization hours at 1.8+3.4 Mms/KWh
 following 500 utilization hours at 1.3+3.4 Mms/KWh
 following 1000 utilization hours at 1.05+3.4 Mms/KWh
 excess utilization hours at 0.8+3.4 Mms/KWh

It should be noted that (i) the fuel factor of 3.4 is revised every 6 months, (ii) for variations of the annual power factor above or below 0.8 the tariff is accordingly decreased or increased by \mp 0.5% for every \pm 1% variation of the power factor. For a power factor less than 0.6 the tariff is increased by 0.1% for every 1% decrease, (iii) the consumer has to pay for the first 1000 utilization hours of the contracted power even if not utilized.

* "Step tariff - a tariff similar to a block tariff except that when each block is exceeded all the K.W.h, not merely the additional ones, are charged at the lower rate."

(2) Alexandria Electricity and Gas Organisation.

A Governmental organisation of the Ministry of Housing and Public Utilities supplying the city of Alexandria and some of its suburbs. The structure of the tariff of this organisation has its own features varying from the Cairo Administration. The scheme is divided into four categories according to the purpose of using electricity within this area.

Lighting Tariff.

The ceiling price for lighting is fixed at 16 mms/KWh. The consumer pays the sum of 1.2 millimes which represents a part of the "Coal item" which is 3.6 millimes and which cannot be totally applied by the organisation since the maximum price per unit is 16 mms/KWh. Moreover the consumer pays for every KWh a municipal tax of 6 millimes and a Governmental stamp of 2 millimes. This makes the price 24 mms/KWh.

$$(14.8 + 1.2) + 6 + 2 = 24 \text{ mms/KWh.}$$

The item 14.8 millimes is the fixed part of the tariff.

Mixed Tariff for lighting and other domestic purposes (one meter).

This tariff is in two types of block tariffs.

(1) Block Tariff.

It is dependant upon the value of the blocks with respect to the number of the rooms of the flat (Appendix 9A). For a 5 room flat or less, a 5A. meter at 115 v. is used, or for more than 5 room flats a 10 A. meter at 115 v. is used.

The tariff is divided into three blocks.

First block at 24 mms/KWh. Second block at 18.4 mms/KWh. (18.4 = 8.8 (fixed charge) + 3.6

(coal item) + 4 (municipality tax) + 2

(Governmental stamp)). The excess charged at a fixed charge of 2.3 millimes and the other items are the same as the second block.

(2) Block Hourly Tariff.

Applied to subscribers with contracted power exceeding those applicable in tariff (1).

Consumers are charged at different rates according to the time of their consumption.

The three types under this tariff are:

- (a) Peak tariff: from 5 p.m. to 11 p.m. divided into two blocks.

First block charged at 24 mms/KWh.

Second block is 18.4 mms/KWh (8.8 + 3.6 + 4 + 2)

Under the rules of the Organisation, the first block shall not exceed the double of the consumption of the first block in tariff (1) (Block tariff).

- (b) Night tariff: from 11 p.m. to 8 a.m. and from 11 a.m. to 2 p.m. The tariff is 8.9 mms/KWh (2.3 + 3.6 + 1 + 2).
- (c) Day tariff: from 8 a.m. to 11 a.m. and from 2 p.m. to 5 p.m. at a charge of 18.4 mms/KWh (8.8 + 3.6 + 4 + 2).

Tariff for commercial purposes.

Applied to commercial subscribers with a certain contracted power i.e.

For lighting: the first block of 1000 hours the tariff is 24 mms/KWh. the surplus is at the price 18.4 mms/KWh (8.8 + 3.3 + 4 + 2).

For other purposes:

- (a) Peak hours from 5 p.m. to 8 p.m. in winter, 24 mms per kilowatt hour.
(It is not applied in summer).
- (b) Day hours from 8 a.m. to 11 a.m. and from 2 p.m. to 5 p.m. in winter and from 2 p.m. to 8 p.m. in summer, the consumer pays at a rate of 18.4 mms/KWh (8.8 + 3.6 + 4 + 2).

(c) Night hours from 8 p.m. to 8 a.m. and from 11 a.m. to 2 p.m. at 8.9 mms/KWh. (2.3 + 3.6 + 1 + 2).

Tariff for industrial purposes.

Motive power: in a two part tariff with a fixed charge of £E 2 per subscribed KW. A running charge with six blocks according to the number of hours in which the consumer uses electricity.

First block: first 750 hours at $4.8 + 3.6 = 8.40$ mms/KWh.

Second block: next 250 hours at $2.8 + 3.6 = 6.40$ mms/KWh.

Third block: next 500 hours at $1.8 + 3.6 = 5.40$ mms/KWh.

Fourth block: next 500 hours at $1.3 + 3.6 = 4.9$ mms/KWh.

Fifth block: next 1000 hours at $1.05 + 3.6 = 4.65$ mms/KWh.

Rest at $0.80 + 3.6 = 4.40$ mms/KWh.

Lighting In two blocks

First block of 1000 hours 24 mms/KWh.

Rest = 18.4 mms/KWh.

(3) The Mechanical and Electrical Department (M.E.D.)

A Governmental Department of the Ministry of Public Works supplying all the electrified irrigation and drainage pumping stations, some municipalities, industrial plants, and water-works and public utility projects. The method of charging these undertakings for electricity supplied to them from the M.E.D. is defined in the following table.

Utilized KWh/annum	Mms/KWh
Up to 50,000	16.6
From 50,001 to 100,000	14.2
From 100,001 to 150,000	11.1
From 150,001 to 200,000	9.9
From 200,001 to 300,000	9.2
From 300,001 to 400,000	8.5
From 400,001 to 500,000	8.2
From 500,001 to 600,000	7.9
From 600,001 to 700,000	7.8
From 700,001 to 800,000	7.7
From 800,001 to 900,000	7.6
From 900,001 to 1200,000	7.5
From 1200,000 to 1500,000	7.3
More than 1500,000	7.1

The tariff decreases with the increase of the number of units consumed by the consumer during

account year. The M.E.D. made some statements to their consumers:

1. This tariff is based on a fuel cost of £E 7 per ton of mazout (fuel).
2. For annual power factor less than 0.8 the tariff is increased by the following percentage:
 $\frac{1}{2}$ (0.8 - P.F.). For annual power factor more than 0.8 the tariff is decreased by the following percentage: $\frac{1}{4}$ (P.F. - 0.8).
3. An administrative charge of 10% is also added.

(4) The Hydro-Electric Power Department (H.E.P.D.)

The Authority is a Department of the Ministry of Public Works in charge of the Aswan Hydro-electric power stations. It is mainly supplying the KIMA fertilizer factory, and the High Dam Construction site. The tariff of energy sold to the KIMA fertilizer factory is designed at a special rate which is much lower than any other tariff. This is because of the lower costs of producing and transmitting electricity in this area and the short distance

between the factory and the power station. The tariff is in three blocks as follows.

1.2 mms/KWh for the first 1000 hours.

1.0 mms/KWh for the next 500 hours.

0.8 mms/KWh for the excess energy.

In addition the KIMA factory pays £E 1.2 million per year as a fixed charge. It had been agreed that this tariff was to be revised at the end of the year 1961/62.

APPENDIX 9 A.

Value of the blocks with respect to the number of rooms of the flat.

No. of rooms.	First block in kwh.	Second block in kwh.
1 - 2 -3	180	90
4	240	120
5	300	150
6	360	180

More than 6 60 kwh. more per room 30 kwh. more per room
kitchens, bathrooms, toilets and passages are not considered.

The entrance hall is considered as one room if its area exceeds six square meters (6 m^2).

If the area of a room exceeds the values in the following table, it is considered as a number of rooms equal to a whole multiple of the given value:

1 to 5 rooms flat	80 m^2
6 rooms flat	90 m^2
7 rooms flat	100 m^2
8 rooms flat	110 m^2
9 rooms flat	125 m^2
10 rooms flat	140 m^2

APPENDIX (9B).Municipal taxes and governmental stamp.

Lighting	Municipal Tax millim	Government stamp millim
First block	6	2
Second block	4	2
Other uses		
First block	6	2
Second block	4	2
Third block	1	2

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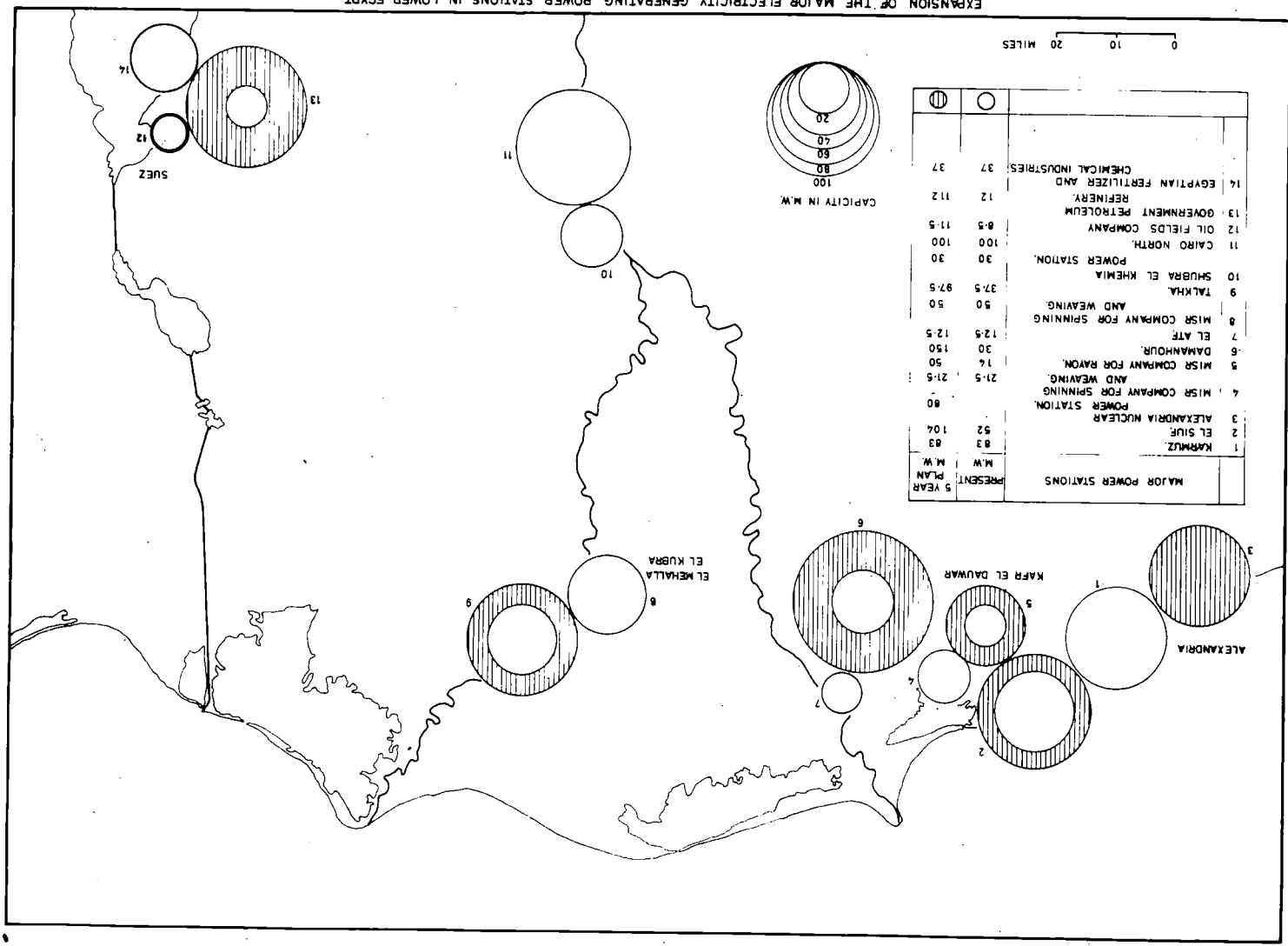
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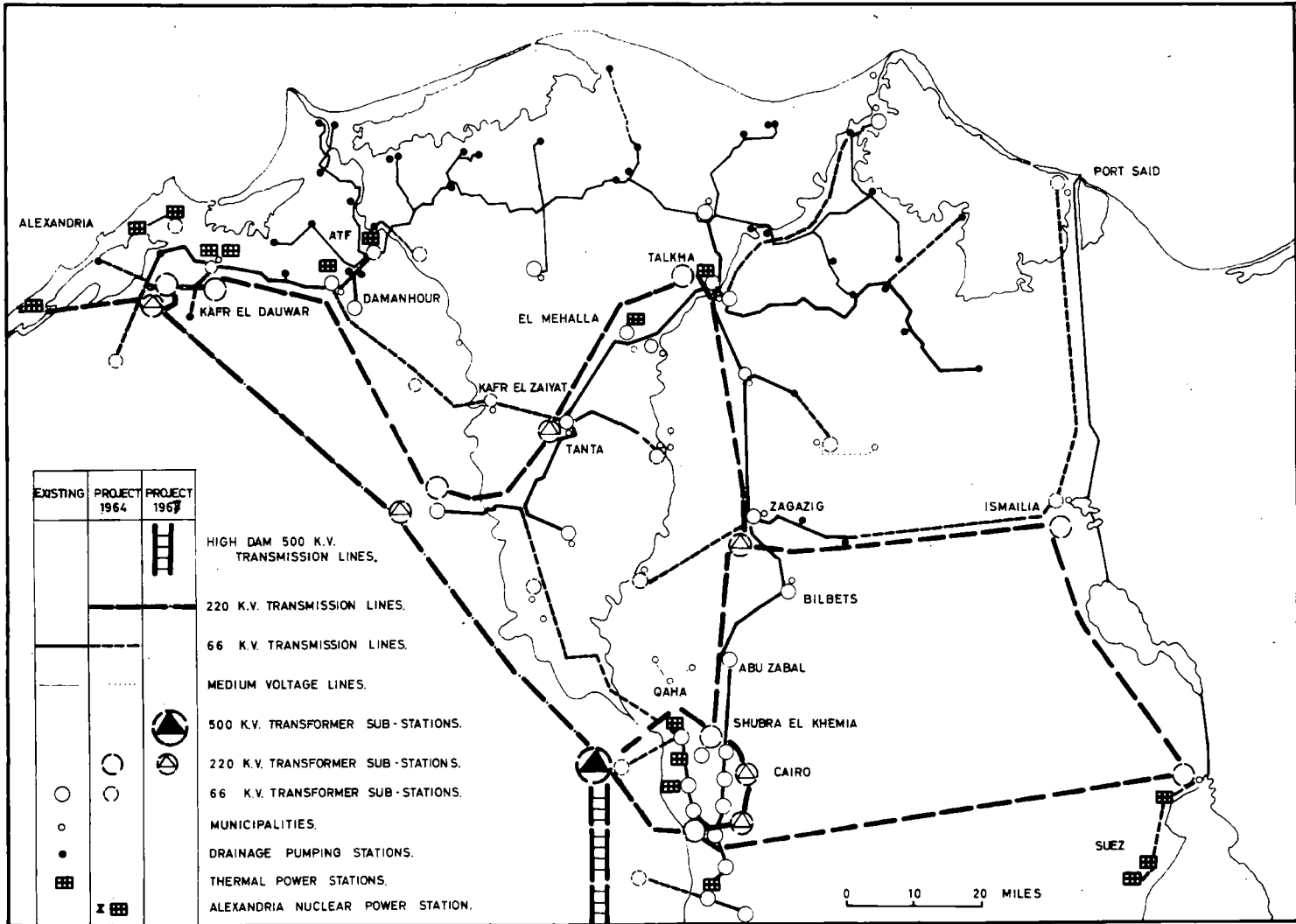
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Map. 1.





EXPANSION OF THE ELECTRICITY DISTRIBUTION IN LOWER EGYPT.

MEDITERRANEAN SEA

