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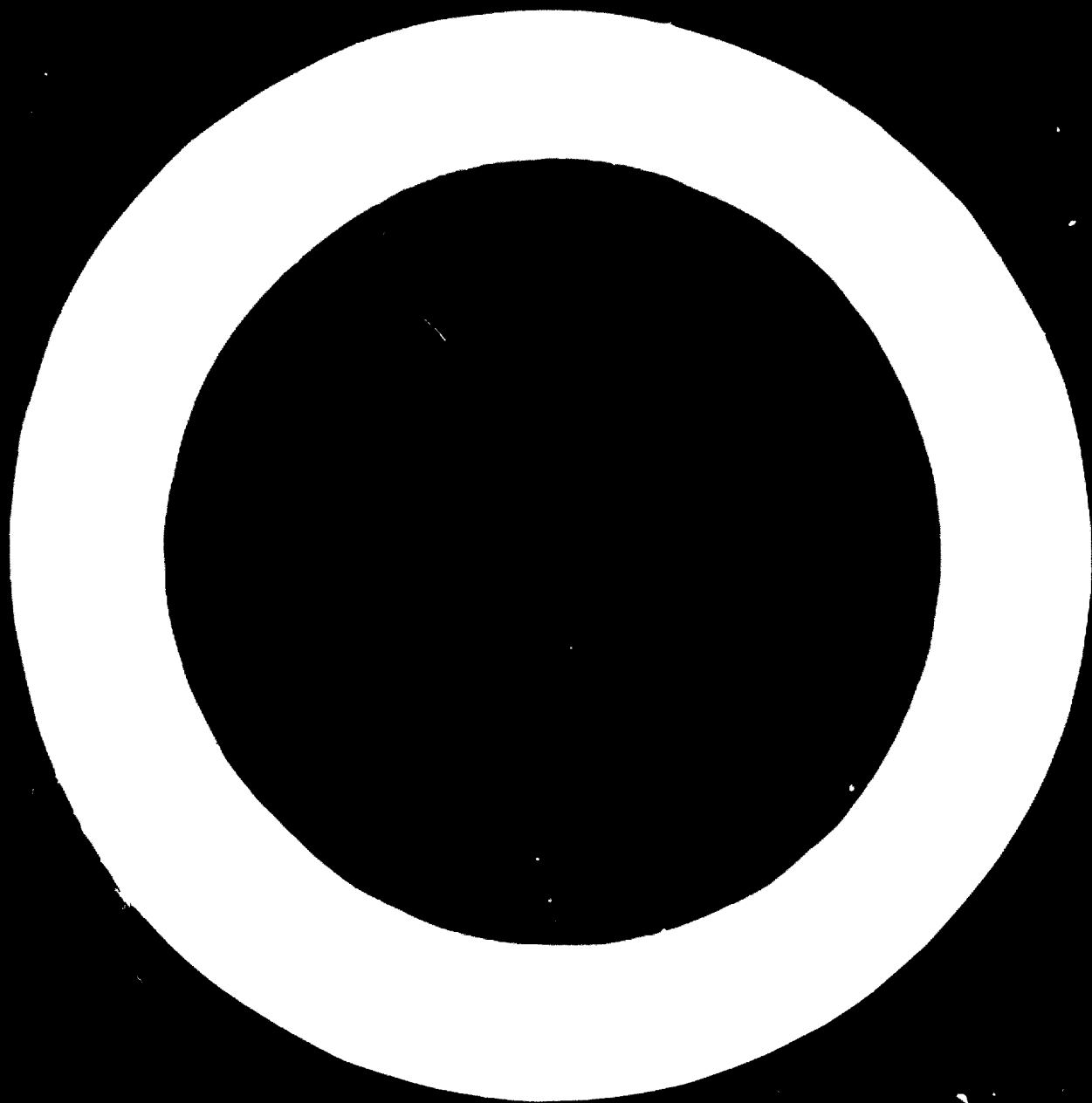
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INDUSTRY IN LIBERIA: DESCRIPTION, STRUCTURE AND PLANNING IMPLICATIONS

(Presented by the Government of
Liberia)



INDUSTRY IN LIBERIA

Description, structure and planning implications1. Scope of the Study

The present paper is a development of what was initially termed "A Study of Establishments." The basic purpose of the study is to establish a list comprising a minimum number of industrial enterprises which would contribute a significant majority of the numerical value of each major indicator of this sector. Thus, it was supposed that less than 10 per cent of the total number of industrial enterprises may provide 70-95 per cent of the total number of persons employed, wage bill, added value, taxes paid, fixed assets, etc., of the industrial sector. The Study of Establishments was to identify the "significant enterprises" and determine their weight in the sector.

Establishing such a pattern is of considerable importance for the planning process. For it enables the planner to reach a satisfactory degree of accuracy in the aggregate forecasts on programmes for a sector composed of, say, 500 enterprises by concentrating on less than 50. If, for instance, the fifty significant enterprises are responsible for 90 per cent of the total value of imports, it becomes possible to forecast (or plan) the total value of imports, for 500 enterprises by projecting accurately only fifty and assuming that the imports attributed to the remaining 450 enterprises will perform according to a statistical formula. If the forecast for these 90 per cent of the total number of units comprises an error of even 100 per cent, the error for the whole sector would still be under 10 per cent. The process of project aggregation, in this concept, consists in the projection of three sectors:

- The sector of the significant enterprises, in which each enterprise is projected individually.
- The sector of "non-significant" enterprises, to be projected globally.
- The sector of new projects, to be considered on the basis of indicators for each individual project.

In a non-diversified economy there can be little doubt that a relatively small number of enterprises is responsible for a substantial majority of the dimension of each indicator. Moreover, it is usually easy to identify the significant enterprises without any extensive research. On the other hand, it is not possible to estimate the weight of the significant enterprises in the sector without knowing for each indicator the value for the total sector and the value for the aggregate of the significant enterprises. This implies that, as a starting point, statistical information on the total sector has to be made available. It is, however, obvious that for this exercise rough data can be used, reflecting orders of magnitude, rather than accurate values for each indicator. In the present paper, approximations have been used freely.

The main indicators which form the object of this study are:

- The number of persons employed.
- The annual wage bill.
- The annual value of imports.
- The annual production at sales cost.
- The annual value of exports.
- The value of fixed assets.

This information is summarized in the following pages.

Other information, available on file, refers to the nationality of the capital, the value of shares, the installed power, the value of rents paid, fringe benefits, value of imports used, locally produced goods purchased, local sales, stock at the beginning and at the end of each year for 1960, 1961, 1962, and sales during the same year.

A list of industrial establishments has been drawn up for the use of the Bureau of Statistics, the Income Tax Division of the Treasury, the Department of Commerce & Industry, etc. This list has served to review "The Directory of Industrial Establishments and Enterprises of the Republic of Liberia" issued by the Bureau of Economic Research, in the listing of industrial enterprises.

The study also provides synopsis of the industrial structure, by giving a brief description of each sub-branch.

Finally, the collecting of data for the study has led to a certain amount of experience in research from available sources.

2. Definitions

For the purpose of this study the industrial sector is considered to be comprised of the following branches:

Mining and quarrying, manufacturing, repairs, forestry, timber and timber processing operations, printing and publishing, engineering, vehicle maintenance, tyre retreads and vulcanology, dry cleaning and laundry.

The construction industry has not been included in the study, since it can best be treated as a separate entity. Its linkage with the investment side of industry may lead to considerable differences in employment, wages and value produced from year to year. A knowledge of past performance in this sector would provide little information on the prospects of the construction industry. However, although the global construction indicators are given separately and the different enterprises are not discussed specifically, a brief description of the characteristics of this branch will be given in the following pages.

The transport industry is not included in the study, also because of its specific statistical and administrative aspects. This branch will also have to be treated as a separate entity in the planning exercise.

The production of rubber contains a certain amount of processing. Nonetheless, this activity is prevailingly agricultural and has not been included in this survey.

Forestry, on the other hand, has been included, due to the overlap of lumbering and timber operations which makes a statistical separation of activities somewhat difficult. For statistical purposes the forestry production of enterprises which are not basically lumbering operations, but rather use the wood, in part or in total, as a building material, such as LAMCO and Firestone, has been evaluated and included as a component of the global production figure. Not taking into consideration this production would have given an incomplete picture of the lumbering and timber branch.

Artisanal establishments and industrial units operated by a single man, with or without the help of members of his household, have been generally left out of the evaluation of aggregate indicators. However, the description of the branches includes, where available, information on such activities. Obviously, it is difficult to differentiate with any precision between small industries and artisanal units.

The global indicators were established in general for the year 1962. This was due to the fact that some statistical sources for later years had not been brought up-to-date. However, since the main aim of the study was to gain information on the structure of the sector, and of the order of magnitude of each branch, the period considered is sufficiently recent.

The employers have usually been omitted from the number of persons employed, in order to give a clearer picture of the employed labour force and, to a certain extent, of the average wages.

The annual wage bill does not include the value of fringe benefits, since information on these items was rarely accurate. However, the available information is on file.

The value of imports includes that of imported articles locally purchased. Thus, the contribution to import for each branch is made clear. It has not been possible to differentiate between the non-recurring import of equipment and recurring import of raw materials and supplies.

The value of production has had to be approximated. The amount of unfinished production (goods in process) has been omitted. In general, the production cycle is sufficiently short and variation between goods in process at the beginning and at the end of the year cannot be significant. Therefore, the value of production was considered equal to the sum of local and export sales plus the difference between the stocks at the end and at the beginning of the year. Where such information has not been available, the value of production has been considered equal to the gross income or to the value of sales.

Similarly, where the value of sales was not available the value of production was considered equal to the value of sales (this assumes that the initial and the final stock of finished goods do not differ appreciably).

Exports were taken at the FOB values.

The value of fixed assets has been taken as the remaining value after depreciation. For newer establishments it has been assumed that the purchasing cost of the asset is equal to its remaining value. In the case of small establishment, where the book value is not readily available, the value of the assets has been considered equivalent to the replacement costs of the asset.

Other definitions can be found in Appendix I - Manual for the Completion of Forms E1-E4 of the Study of Establishments.

Wherever information for a certain year was not available, the figure for the preceding year or for the following year was taken to afford an order of magnitude to be used in the estimation of global indicators for the whole sector.

3. Sources

Eight basic sources of information were used in the study. These are enumerated below:

- i. The "Study of Establishments", of 1962-1963.
- ii. Company information, such as annual statements, reports, etc.
- iii. Direct investigations conducted by the Office of National Planning.
- iv. Bureau of Labour files.
- v. Bureau of Domestic Trade files.
- vi. Income Tax returns for 1961-1964.
- vii. Report of the Battelle Institute, 1962-1963.
- viii. O.N.P. Estimates.

Where estimates had to be made, the method of estimating was recorded in a note, available on the file of this study.

A discussion of some of the above list of sources of information is warranted.

The major part of the data was obtained from the returns of the "Study of Establishments." Appendix 1 describes this exercise.

Some data was made available from the income tax returns filed by the enterprises. A separate "Note" discusses the possibility of this source of statistics.

Valuable data, mainly aggregated for different sub-branches, was extracted from the field survey of the Battelle Institute carried out in 1963, when CNP personnel collaborated with the delegates of Battelle.

Data on the number of persons employed were obtained from the reports on file at the Bureau of Labour. The reports referred to a period in 1963, and are therefore indicative only of the size of the enterprises, the branches and the total sector; since they do not correspond exactly to the numbers which have received the wages and salaries recorded by the study, and which refer to the year 1962, this limits any conclusions concerning the average wage in a specific branch.

4. The Industrial Sector in the Liberian Economy

The Industrial Sector as defined in chapter 2 is composed of some 800 establishments. Except for some 30 enterprises (4 mining companies, 17 lumbering and timber operations, 5 quarries and a few other units) the industrial establishments are all located in the Monrovia area. Some of the main aggregate indicators for the industrial sector are given below - approximately.^{1/}

Total number of persons employed	16,200
Annual wage bill \$... ..	16,100,000
Annual value of imports \$	61,400,000
Annual value of exports	34,200,000
Annual value of production	50,300,000
Value of fixed assets	130,400,000 ^{2/}

^{1/} Data for 1962. By 1964 the number of industrial establishments may have increased by some 9 per cent.

^{2/} The value of fixed assets has increased considerably, since 1962, owing to heavy investments in the iron ore enterprises.

No study has, as yet, been carried out to determine the contribution of the various sectors (agriculture, industry, commerce etc.) to the national income. There is no doubt, however, that the weight of the industrial sector in the national economy is increasing rapidly, owing mainly to the stepped up production of iron ore.

In 1962 some 90,000 persons were employed in the monetized sector of the economy. The industrial sector, as defined above, accounted for about 18 per cent of the total number of persons employed in the monetized sector.

The construction sector employed a number of persons about equal to that of industry (15,800).

In 1964, employment in the construction sector decreased owing to the termination of major investment activities by LAMCO.

The total value of imports in 1962 was approximately \$ 132 million, of which the industrial sector accounted for about 47 per cent. The industrial sector also accounts for some 53 per cent of the total exports from Liberia (approx. \$ 65 million in 1962).

5. The Structure of the Industrial Sector

Appendix 2, structure of the industrial sector, gives the major indicators for the industrial sector and for the various branches and sub-branches which compose it.

Mining is obviously the most important branch. The four iron ore mines, LAMCO, LMC, NIIC, DELINCO employ some 8,800 persons, or 54 per cent of the total number of employees in industry. The wage bill of the iron ore industries amounted to \$ 10,400,000 and represented in 1962, 64 per cent of the sum for all industrial enterprises.

Imports for the mining sector consisted nearly exclusively of equipment and materials necessary for the investment period. The value of imports in 1962 totalled \$ 57,500,000, over 94 per cent of the sum for industry.

Annual production amounted to over \$ 29,000,000 or 58 per cent of the total for industry. The whole production is destined for export.

Total exports amount to about \$ 20,000,000 and represent 88 per cent of all exports of the Liberian-based industry. The only other export, diamonds, is also a mineral product.

The value of mineral assets in the mining enterprises amounted to about \$ 113,000,000 in 1963, which represents 87 per cent of the total for industry. In 1964, after the major investments in the iron ore industries have been concluded, the value of mineral assets amounts to over \$ 250,000,000.

In 1962 some 6.7 million long tons of iron ore were produced and exported. In 1963, the output jumped to 8 million tons as a consequence of the commissioning of the L&S-4500 mines. It is expected that by 1966 all the mines will be in full production and that the output will be in the range of 17.5 million tons annually with an export value of \$ 120,000,000.

With the exception of one mine, in which Liberian Government capital predominates, the iron ore investment was made by Swedish, American, German and Italian capital.

It is not possible within the present context to describe the mining operations in any detail. It is however of note that the four enterprises engaged in iron ore mining will play the most important role in the development of the economy during the next 5-10 years.

Diamond exports totalled 634,000 carats in 1963 and 677,000 carats between September 1964 and August 1965, a slight decline on the previous year. The value of such exports was of \$ 1,300,000-\$ 4,600,000.^{1/} It is difficult to estimate the proportion of the diamonds that were actually mined in Liberia. It is speculated that domestic production was only about 25 per cent of the total of exports. All other diamonds mined in Liberia come mainly from small mines and prospectors and one-man enterprises. In 1962-1963 there were 103 miners and 646 licensed prospectors.

The Liberian Government has restricted the license for diamond prospecting in Liberia, St. Paul's Minerals Ltd. (a subsidiary of the Diamond Corporation) and the Liberian Mineral Corporation (LIMCO). At present the diamond mining companies are engaged in extensive experimental finds. Including the diamond Corporation, some 1,200 persons are employed in the

diamond industry with a total wage bill estimated at \$ 1,200,000 per year. Employment in the diamond industry represents some 7 per cent of total employment in industry and the wage bill represents the same proportion of the total wage bill in industry.

Quarrying and stone crushing is carried out by private establishments and by some 80 independent stone crushers. All the enterprises are located in the vicinity of Monrovia and the individual stone crushers operate in the Mamba Hill, Crown Hill, and Bassa Community Areas.

The five quarries are equipped with modern crushing and sorting machines. The exploitation is carried out by blasting with explosives. The quarries produce crushed rocks of 2-5" diameter. A quantity of rock dust, amounting to about 50 per cent of the crushed rock is obtained and sold to the concrete block manufacturers as a filler.

Since 1963 business has deteriorated considerably, due to the fall in the volume of construction and to considerable quantities of crushed rocks sold by the Bomi Hills iron ore mining operation. The total capacity is of about 100,000 cu. yards of crushed rock/year. At present less than 50 per cent of the capacity of the quarries is used.

The quarries employ some 300 men, of which 8 non-Africans and one non-Liberian African.

Total employment in rock crushing and quarrying represent somewhat less than 2 per cent of the employment in industry. The wage bill of \$ 123,000/year amounts to less than 1 per cent of the wage bill in industry.

The 80 odd individual stone crushers use only rudimentary manual means and sell the crushed rock to persons in the lower income bracket to build their own houses.

The annual capacity of these individual operations does not exceed 4,000 cu. yards and the value produced is in the range of \$ 50,000/year.

It is probable that the individual operations carry high hazards of silicosis.

Electric energy is produced by some 40 plants. With the exception of a small hydroelectric facility (composed of 4 units and totalling 4,000 kw), owned by Firestone in Harbel, the whole production is obtained, at present, from diesel - and gasoline units of which there are over 330 throughout the country. Total installed capacity in 1962 amounted to some 33,000 kw. In 1964 installed power reached about 118,000 kw. marking a 257 per cent increase over two years. Sales of power is officially undertaken only by the Power Division of the Public Utilities Authority which sponsors the production of power in the coastal towns.

It is not relevant, within the present context to examine in any detail the operation of the Public Utilities Authority. This will constitute the object of a special study to be carried out by the Planning Agency. It may however be useful to give a brief outline of the electricity situation.

The facilities administered in 1964 by the Power Authority are:

Bushrod	...	...	13,000 kw.
Krutown	...	...	7,180 kw.
Sinkor	...	...	1,120 kw.
Buchanan	...	...	373 kw.
Harper	...	...	475 kw.
Greenville	...	...	271 kw.
Robertsport	...	...	<u>271 kw.</u>
		Total	22,690 kw.

In other towns of Liberia, electricity is not yet supplied as a public utility and the production for own consumption is based on very small privately owned units.

At present most major industrial and agricultural users of electricity rely on their own generating facilities, at least as stand-by capacity. Existing plants of the Power Authority in Monrovia are all 60 cycle, 3 phase A.C. generating at 2,400 volts.

The transmission facilities include 69 kv lines from Bushrod Island to Bomi Hills, Congotown, Kakata and Harbel. On most of the 63 kv lines there are 12.5 kv underbuilt. Other 12.5 kv lines are from Kakata to Totota and

in Monrovia. The power system includes inter-connections with the L.M.C. plants at the Freeport and in Bomi Hills and with Firestone at Robertsfield. It is expected that in the near future the coastal towns of Monrovia, Buchanan and Robertsport will be interconnected.

With energy demand increasing at a tremendous pace (it has doubled in three years) the supply position has been uncertain over long periods. This situation will be remedied when the new hydroelectric power plant of Mount Coffee, on the St. Paul River, a \$27 million project comes into operation in 1966. Mount Coffee is a 30,000 kw facility based on a low head run of the river hydro-installation with two generators.

Relatively low further investments (\$3-5 million) will permit additions of further 15,000 kw units. If, in future years, a reservoir upstream is constructed, a total installed capacity of 90,000 kw can be obtained.

The ratio of the Power Authority range between 3.5-5¢ kwh for industrial consumers and up to 9¢ for private consumers.

The Power Authority employs, at present, some 380 persons of which 17 are expatriates and pays about \$420,000 in annual wages. In 1962 employment represented 3 per cent and wages represented about 2 per cent of the totals for the industrial sector.

In previous years the gap between collections and billings has been inordinately high. The situation has improved considerably and, at present, collections apparently exceed 90 per cent of billings. Energy production in 1964 amounted to some 195 million kwh for the whole country. Production of the Power Authority amounted to 92 million kwh with a gross operating income of about \$3.2 million. In 1962 the operating income represented only about \$1.3 million or some 3 per cent of the total value of production in that year.

Foodstuffs manufacturing includes the following sub-branches:

Bakeries, coffee roasting, ice cream manufacturing, milk reconstituting, brewing of beer, distilling, soft drinks manufacture, palm oil refining and cold storage.

There are 65 enterprises in this branch, employing some 580 persons (4 per cent of the total for industry).

The annual wage bill for these enterprises totals some \$365,000 (2 per cent of the total for industry). The total imports for 1962 amounted to about \$730,000, which is only a little over 1 per cent of the total imports for the industrial sector. Since the total sector imports are composed mainly of the equipment imported for the major investments in the mining enterprises, it is relevant to compare the imports for the foodstuff manufacturing branch with the total imports for the whole industrial sector excluding the mining concessions. In this case, the imports for the foodstuff industry exceed 18 per cent of the total.

The value of annual production was about \$1,470,000 in 1962 (3 per cent of the production for the total sector). No manufactured foodstuffs are exported.

The value of fixed assets for the foodstuffs industries is about \$3,500,000, representing some 3 per cent of the total fixed assets for industry.

Baking of bread is carried out by four establishments with modern equipment and by 21 small units, each usually operated by one woman. These small units use rudimentary ovens and produce bread and baked pastries as well as cassava products.

One of the four modern bakeries also produces cakes and pastries and operates in conjunction with a tea room. With one exception all the above-mentioned establishments operate in Monrovia. The only bakery which was identified outside of Monrovia is a one-man unit in Nyein.

The four modern bakeries are owned by foreigners (Italian, Lebanese and German). The products are of satisfactory quality and are sold to the individual consumers as well as to some 350 commercial businesses, including restaurants. The Lebanese bakery supplies the unleavened bread in demand from the Lebanese population.

This industry employs about 125 persons of which 16 non-Africans and 4 non-Liberian Africans.

The total capacity of the modern establishments is of about 1,800 tons of bread per annum. The artisanal enterprises have a capacity of about 250 tons of products per month. At present, about 80 per cent of the capacity of this branch is being used, and the annual value of production is in the range of \$1,000,000.

The total employment in bakeries represents less than 1 per cent of the employment in industry and the wage bill of about \$55,000 is less than 0.5 per cent of the industrial total.

Roasting of coffee is carried out by two enterprises in Monrovia, catering to local consumers and using Liberian and Guinean coffee. Only one of these units is of any significant size, the second producing about 16 per cent of the amount manufactured by the first. The larger unit is owned by a Liberian and the smaller unit by a Lebanese.

The total capacity amounts to some 800 kg. of coffee per day, but only about 10 per cent of this capacity is utilized. The roasted coffee produced is of good quality and economically priced and it could be envisaged that with proper packing and inspection some export trade could be developed.

The coffee roasteries employ some 6 persons, of which one is Lebanese. The value of annual production is in the range of \$10,000.

Manufacturing of ice cream is carried out by 3 enterprises located in Monrovia. The products are manufactured under hygienic conditions and are of good quality. The ice cream is sold in ice cream parlours, from trailers and bicycle driven carts.

One of the enterprises is Liberian owned, the other two being Spanish and Italian owned.

The ice cream production employs 17 persons, of which two are non-African. The annual value of production is of about \$50,000, most of which is sold during the dry season.

Reconstituted milk was produced by one establishment connected with a cold storage enterprise. The plant was located on Bushrod Island and used imported milk powder and various additions to produce reconstituted milk, cocoa, yogurt which were filled in bottles or in $\frac{1}{4}$ litre waxed paper containers.

The plant used modern equipment and the products were hygienic and of good quality. The enterprise was owned by British capital.

The annual capacity was of some 250,000 gals. of which only about 35 per cent was used. The annual value of the production is \$100,000-\$120,000. Recently, the operation was closed down, probably because of the insufficient market.

Brewing of beer is carried out by a modern brewery established in Monrovia. The ownership of the brewery is Liberian and Swiss. The plant also produces a number of soft drinks. The production of both beer and soft drinks is destined only for consumption in Liberia.

The brewery employs 166 persons of which 10 are non-Africans and 5 non-Liberian Africans.

The capacity of the brewery is of 900,000 - 1,000,000 gals. of beer per year. At the beginning of 1963, only a fraction of this capacity was used. However, after the introduction of a protective tariff in March 1963, which had the effect of nearly doubling the price of foreign beer, consumption of local beer increased considerably and at present the capacity is nearly fully utilized. Plans for the expansion of the brewery are now in process.

All raw materials with the exception of water are being imported, as are the bottles, crown corks and cartons.

The rejects of about 360 tons/year are sold as an animal feed and fertilizer.

The total value of beer produced is in the range of \$2,000,000.

Total employment in the brewery and the total wage bill represent about 1 per cent of the total employment and the total annual wage bill in industry, respectively.

Distilling of Spirits for rum is carried out in some 50 distilleries. One unit of significant size and technically well equipped is situated in Monrovia and uses imported brown sugar as fermentation raw materials. The plant is owned by a Liberian entrepreneur. The enterprise is also capable of producing liquors. Distribution is carried out through Lebanese and Liberian stockkeepers throughout Liberia.

The other distilleries, situated mainly around White Plains, Millsburg and Arthington use locally grown sugar cane which is crushed in small installations and ferment and distil the cane juice. Approximately twenty of these enterprises use small diesel or gasoline engines of 2-4 h.p. and employ on an average 5 workers. Some 30 other enterprises use hand presses and employ on an average one worker. Distillation is usually carried out in copper sheet stills manufactured in local workshops.

A certain amount of production is based on customs processing, whereby a number of farmers bring their sugar cane to be pressed, after which the cane juice is fermented and distilled. The distiller usually keeps about 1/3 of the distilled rum as processing fee.

The bagasse resulting from the pressing of sugar cane is not utilized.

The distillery situated in Monrovia has an annual capacity of about 25,000 gals. of rum. Currently about 60 per cent of this capacity is used.

The annual capacity of the rudimentary units located outside Monrovia is about 80,000 gals. of rum of relatively low concentration.

The total value of rum produced by all the establishments is in the range of \$110,000 per year. Total employment in the distilleries represents about 1 per cent of the total employment in industry. The wage bill for these establishments is only about 0.5 per cent of the total wage bill for the industrial sector.

A modern distillery is at present under construction in Monrovia and will be in operation at the end of 1965.

Soft drinks are now produced in six establishments. In 1962-1963 only two establishments were in operation.

All the soft drinks plants are located in Monrovia and are equipped with modern installations. All except two work under franchise contracts, producing internationally known brands (Coca cola, Canada Dry, Mission, 7 UP).

One of the soft drinks plants is operating as an annex of the brewery, using fermentation carbon dioxide. A second company is operated as a subsidiary by a major agricultural concession. The third plant is Liberian owned. A further two establishments are owned by Lebanese enterprises.

All these units produce only for internal consumption.

The production is of satisfactory quality and moderately priced, but in most cases profits are marginal owing to keen competition. The Liberian market probably does not warrant the large number of soft drinks plants.

The soft drinks industry employs at present about 180 persons. The capacity for soft drinks production at the beginning of 1963 was in the range of 1,700,000 gals/year. At that moment, utilization of capacity must have been nearly 100 per cent. At the beginning of 1965, the capacity of soft drinks production must be of nearly 5 million gals/year and it is believed that it is utilized under 50 per cent.

Total employment in the soft drinks industry represents a little over 1 per cent of the employment in the industrial sector. The proportion of the wage bill to the total wage bill for industry is in the same range.

Refining of palm oil is carried out in a relatively modern establishment in Virginia, on the shore of the St. Paul River. Palm oil production is also undertaken on a family, or village basis in most parts of Liberia, mainly by hot-skimming. At present, in Liberia only wild palm fruits are used.

The modern establishment located in Virginia is equipped with stock presses for obtaining palm oil from palm fruits. However, the presses have not been used for a few years, since it was proved unprofitable to base the process on palm fruit. At present the enterprise is only occasionally purchasing crude palm oil from local producers and refines it by steam heating. The refined palm oil is sold in beer bottles and 1 lb. cans.

The plant is owned by German interests. The manager has attempted to set up a producers' co-operative to ensure the supply of palm bushels, but has achieved little success, owing mainly to the high cost of labour for the cutting operation which requires the cutters to climb up the tall wild palms.

Palm kernels are exported through the Liberian Produce Marketing Corporation.

The enterprise in Virginia employs 20 persons of which 1 is non-African. The plant has a capacity of processing about 1.5 tons of palm fruits per day. The refining capacity was used in a proportion of 80 per cent in 1962 but was hardly used in 1964.

During a small number of days per year (usually 3 days in April) the enterprise uses the palm oil equipment to process locally produced pineapple for pineapple juice.

Cold storage installations are used for the preserving of imported foodstuffs and for fish caught by a major fishing enterprise. Two major cold stores are located on Bushrod Island.

The cold store for foodstuffs is connected with the above-mentioned enterprise for the reconstitution of milk. It is owned by British interests.

This enterprise also produces ice in blocks which is supplied to consumers in Monrovia.

The cold store used for fish is a joint venture of American and Liberian capital. It is mainly used for the storage of tuna fish caught by a Japanese trawler fleet. A certain proportion of the catch is sold in Monrovia through saleswomen.

The cold stores employ 32 persons of which 8 are non-Africans and 4 non-Liberian Africans.

The capacity of the foodstuffs cold store is of 300 tons and that of the fish cold store is of 120 tons. The capacity of both installations is fully used. Total investments in these installations represent some \$ 250,000.

Manufacture of footwear is undertaken by one establishment operating in the Monrovia industrial park. The footwear factory is a modern unit, operating as a joint venture of the Liberian Development Corp. and Swedish capital. It is producing canvas topped rubber sole footwear and plastic sandals for internal supply. The factory commenced operations in 1964.

The production is of satisfactory quality but has to compete with the low priced products from Hong Kong.

The footwear factory employs 100 persons of which 4 expatriates.

The total capacity for the different kinds of footwear is:

Rubber soled	...	...	360,000	pairs/year
Leather sandals	...	...	50,000	" "
Plastic "	...	...	650,000	" "
Rubber boots	...	...	50,000	" "

At present 30-50 per cent of the capacity is used and the value produced annually is in the range of \$300,000/year.

Plastic goods are not produced at present in Liberia, except for the above mentioned production of plastic sandals. However, in 1962 a small unit owned by a German firm produced plastic pressed goods, mainly combs in a rudimentary workshop. This unit employed three persons and the total annual production amounted to some \$30,000.

A modern unit for pressed plastic goods is now under construction and will commence production before the end of 1965. It is connected with a Nigerian based enterprise.

Manufacture of trousers and shirts is undertaken commercially by one factory owned by a Lebanese national. The unit is manufacturing men's underwear, trousers and shirts, using 26 electric sewing machines.

It was originally believed that orders could be obtained from the Armed Forces, the Police and the Post Office and with this aim, a building was erected on Bushrod Island on an area of about 1 acre.

About 10 per cent of the production is sold in a store on Broad Street, but the greater part of the production is supplied through middle men to stores in Monrovia and in other parts of the country.

Owing to keen competition from local tailor shops and from imported goods, prices have decreased considerably. For this reason only 29 employees have been retained (of which 4 Lebanese), whereas the number in 1961 exceeded 70.

The enterprise can produce 125 trousers or 64 shirts per day. At present only 25 per cent of this capacity is utilized. The annual value of the production is in the range of \$50,000. In 1961 and 1962 the value was nearer \$100,000.

Tailor shops operate mainly in Monrovia. There are some 15 tailor shops employing between 3 and 10 Liberian tailors. Some 285 more workshops work on an artisanal basis, operated mainly by Liberians but also by Lebanese and Spanish owners. Using foot driven sewing machines, they produce trousers, shirts and ladies' dresses from materials provided by the client.

The larger workshops employ about 80 persons of which some 5 non-Africans.

The annual value of the production of the tailor shops is in the range of \$400,000. The major 15 units mentioned above account for about a quarter of this production.

Shoe repairs are carried out by six shops in Monrovia. Workmanship is usually of modest quality. Two units are equipped with relatively modern tools.

The workshops employ 24 men of which 2 are non-Africans. The annual value of production is in the range of \$40,000.

Lumbering and saw mills are major industries, involving a relatively high capitalization. There are 16 operations in Liberia, all owned by foreign capital.

Three timber concessions (Firestone Plantations Co., LAMCO and Tropical Trading Co.^{1/}) are not producing for sale but for the use of the parent company exclusively. Between 1961 and 1963, these three concessions have produced 40-50 per cent of all the timber cut in Liberia.

It is not necessary in this context to discuss in detail each of the lumber enterprises. However, a brief presentation of each of the timber concessions would serve to illustrate the structure of the lumbering sector.

^{1/} Owned by L.M.C.

Le Tourneau of Liberia conducts a logging operation as a part of a general agricultural concession. Initially most of the timber cut by Le Tourneau was for the company's own use. Le Tourneau of Liberia is a subsidiary of the American firm which has been granted a concession in the Baffu Bay area.

The Maryland Logging Corporation was granted concession rights in the area of the Grebo National forest and in other non-reserved areas situated between the Cavala River and the Grand Cess River. The corporation was founded by a German investor who owned a veneering factory in Germany. The concession and equipment was then jointly acquired by Atlas General Industries and Brandler & Ryke, a British firm. It appears that in 1965 a new influx of Dutch capital was absorbed by the Maryland Logging Co.

The Liberian Industrial Forestry Corp. (LIFC) is owned by Spanish capital and has been granted land in the Gbama tribal forest reserve (Western Province). In addition LIFC develops timber on land originally granted in the Lunarriz concession. Although LIFC has exported minor quantities of timber, it is mainly oriented towards supply of the local market.

The Siga Lumber Company is financed by Swiss capital. Its concession is situated in Grand Bassa County and in the Tappita District. So far, Siga has not exported any timber.

The Anglo Liberian Timber & Trading Co., with British capital has been granted a concession in Sinoe County. At present the Anglo Liberian Timber & Trading Co., and the Maryland Logging Co., are the only timber exporting businesses of any significance.

The LII Timber Company operating in Tappita and the Tappita-Tchien road areas is financed with British capital. It has produced mainly for internal consumption but has also accounted for some export in 1963-1964.

The Ganta Mission which has a concession in Ganta is cutting timber for local consumption. It is one of the smallest operations in Liberia in this field.

The Liberian-American Agricultural & Industrial Corporation (LAAIC) financed with American capital operated up to 1960 in the Bopolu area also owning wood impregnation facilities. This company has now ceased operations.

The Liberian Company, primarily an agricultural concession is exploiting timber in the central area east of Ganta. The company also acts as agent for the Delta Line and is represented on the board of Directors of the Monrovia Freeport Management Company. Most of the timber cut by the Liberian Company has been destined to be used internally.

The Liberian Timber Industries Corporation (LITICO) has been granted a concession in the Central Province but has not begun operations. At present the concession has been cancelled. The Morro River Lumber Company has been granted a concession in Central Province. The same company has a concession in the Tappita area.

The Bolado Sawmills, a Spanish financed company has recently been granted concessions in Salala. A "salvage operations contract" was granted to the Alfred Mensah Company in Yangaya in 1964. In the same year a permit for forest survey was awarded to the "Société des Investissements et de Développement en Afrique (SIDA)", a company with Israeli capital. No final report on the survey has as yet been obtained from SIDA but it is believed that the company will not commence operations.

Apart from the above mentioned enterprises, which are mechanically equipped for lumbering and timber operations, a number of individual lumberjacks and pitsawyers produce between 2,000,000 and 3,000,000 bd. ft. of planks/year. The branches and trunks of lower quality are sawn or chopped down with axes to be used as firewood and sold in cords. Such operations have to be discontinued during the rainy season, since the high humidity makes the wood useless as firewood and as planks.

Out of the total stumpage of some 16,000,000 bd. ft., during September 1963 to September 1964, about 3,000,000 bd. ft., were exported, mainly from the production of the Maryland Logging Co., and the Anglo Liberian Timber & Trading Co.

The lumber and timber operations employ some 2,250 workers. Although the nationality structure for the employment in this industry is not known, it is estimated that some 5 per cent non-Africans are employed. The utilization of the production capacity is in the range of 60 per cent with a number of sawmills inactive for prolonged period of time.

The individual lumberjacks and pitsawyers operate in most regions of Liberia. In the vicinity of Monrovia the operations are concentrated mainly in the Junk River area.

Total employment in these operations represent over 14 per cent of the employment in industry. The wage bill, amounting to some \$1,400,000, is about 2 per cent of the wage bill in industry.

Manufacture of furniture constitutes the object of some 28 enterprises, of which two are sections working for the sole use of major concessions. The 26 enterprises producing for sale are situated in Monrovia. Of these 15 enterprises currently employ between 1 and 4 men. One major enterprise situated on Bushrod Island employs some 40 workers. The furniture industry employs some 160 persons of which 7 are non-Africans and 28 non-Liberian Africans.

The production programme includes wood and rattan furniture, cabinets, unpolished and polished house furniture and upholstered furniture. The smaller units, less well equipped, are obliged to give out some of the more sophisticated operations to be executed by the larger units.

The quality of the work is modest and the local furniture industry caters mainly to the lower income group of the population. The high quality wood species, quite frequent in the Liberian forest, are hardly used, and the quality of the polish is often unsatisfactory.

It has been estimated that the total capacity of the furniture industry is in the range of 2,000-2,500 cu. yds., of sawn timber per year. Between 50 and 60 per cent of this capacity is used and the annual value of production is of \$200,000.

Employment in the furniture industry in 1962 represented about 1 per cent of the total employment in industry. The wage bill represented about 0.7 per cent of the total industrial wage bill.

Carpentry operations are often sections of building construction establishments. There are 23 establishments engaged in carpentry, of which 6 belong to major mining and agricultural concessions, one services the Department of Public Works & Utilities, one services the USAID Mission, seven are attached to building construction establishment and only eight produce for independent supply. With the exception of the carpentry sections belonging to foreign concessions, all the other carpentry establishments are located in the Monrovia area including Bushrod Island.

The production of these establishments includes doors, windows, the respective frames, shelves, super-structures for trucks, etc.

The general situation of the business has deteriorated to a certain extent since 1963, owing to the slump in the construction business.

The 17 establishments which are not producing for the major mining and agricultural concessions, employ some 215 persons of which 19 are non-Africans, and 48 non-Liberians.

The total capacity of these 17 enterprises is estimated at about 3,000 cu. yds. of processed sawn timber/year. About 75 per cent of this capacity is utilized and the value of annual production is in the range of \$330,000.

Employment in carpentry operations represented 1.3 per cent of the total employment in industry, which is about the same as the proportion of the wage bill in the carpentry establishments out of the total industrial wage bill in 1962.

The Lumbering and wood processing industry is already one of the most important economic activities in Liberia. Employment in these occupations in 1962 represented about 16 per cent of the total employment in industry, and the wage bill represented about 10 per cent of total wages paid in industry. The value of annual production represented only 5 per cent of the total value of industrial production, but its weight within the industrial sector is likely to increase rapidly over the next few years.

Printing was carried out by 13 enterprises, of which 11 are located in Monrovia.

Four of the printing presses located in Monrovia are major enterprises, printing newspapers or various government publications, and 7 are small units, mainly engaged in the printing of visiting cards and letterheads.

Of the 4 major printing presses only one is privately owned. The other units belong to the Government although one unit publishes an independent newspaper.

The above mentioned printing plants publish two daily newspapers and one by-weekly.

Only one of the plants uses modern equipment. The equipment of the other plants is obsolete.

Of the 7 remaining establishments in Monrovia, one is owned by a religious organization, one belongs to the Liberian Information Service, and one is attached to an international aid organization.

The other 4 enterprises engage nearly exclusively in the printing of visiting cards and letterheads.

Two small establishments are located outside Monrovia. One of these is established in Cape Mount County and the second in Zorzor, where it publishes a weekly newspaper in the Lorma language. At present, some 30 local newsletters are published by the Liberian Information Service.

The printing industry employs some 200 persons of which 15 are non-Africans and 15 non-Liberian Africans.

The capacity of the major establishment is in general satisfactorily utilized. The smaller units utilize their capacity in a less satisfactory proportion.

Employment in printing plants represented about 1.2 per cent of the employment in industry and the wage bill amounted to about the same percentage of the total wages paid in industry in 1962.

Metal processing is the object of 14 metal workshops in Monrovia. A number of workshops, owned by the major mining and rubber industries in the country, are situated outside of Monrovia. The data for these establishments have not been considered in the present paper. Furthermore, throughout the country, there is a considerable number of blacksmith shops, which undertake work within the villages. In the neighbourhood of Monrovia alone it was possible to locate 60 blacksmiths.

The production of the metal workshops includes door-and-window frames, roquebars, distillation stills, water tanks and reservoirs. One enterprise also carries out sanitary installations and drilling of wells.

The production of these enterprises is mainly destined for the Monrovia market and the surrounding area. However, distillation apparatuses are sold to cane juice distillers throughout the whole of the country.

The capacity of five larger metal processing enterprises is satisfactorily utilized. These units employ at least 10 workers each and are located on sites of 400-1,000 sq. yds.

The nine smaller enterprises, employing between 1 and 4 workers, on sites averaging about 100 sq. yds., are less well equipped and for this reason have limited production programmes and cannot use their capacity satisfactorily.

As yet, no foundry has been established in Liberia, although two of the major metal workshops have plans to install small units.

The enterprises situated in Monrovia employ 135 persons, of which 19 are non-Africans.

The value produced by the metal workshop is in the range of \$850,000 to \$1,000,000/year.

Employment in the metal processing industry represents less than 1 per cent of the employment in the industrial sector. The total wage bill of just over \$100,000, amounted to about 0.6 per cent of the total industrial wage bill in 1962.

Vehicle repairs are carried out by 39 garages, undertaking work for various clients, and by 10 workshops which operate as annexes to the construction and transport enterprises.

All the enterprises working for third parties are situated in Monrovia. 16 of these 39 enterprises also act as agents for various makes of automobiles. They are mainly engaged in repairs for cars represented by them, but also undertake work for other makes. In general, the agents for the different makes of automobiles, have considerable stocks of spare parts, exceeding in value the mechanical endowment of the enterprise.

The garages belonging to this category are generally well equipped, and employ a significant number of foreign mechanics. They employ between 20 and 140 persons and occupy areas of 5,000 to 10,000 sq. yds.

The smaller enterprises, employing between 5 and 15 workers on areas of 200-600 sq. yds., are owned generally by Lebanese nationals. These enterprises are in general less well equipped and undertake mainly small repairs, including upholstery and car painting. The enterprises rarely carry stocks of spare parts and prefer to purchase these from the respective agents.

The garages cater for services not only in the Monrovia area, but also to vehicle owners all over the country.

The capacity of the garages has been estimated at about 200 repairs/day. The utilization of this capacity is estimated at 75-100 per cent.

The value of annual production of these enterprises is in the range of \$5,300,000, which makes it economically, one of the important branches of the sector.

The garages employ about 750 employees, of which 19 are non-Africans and 20 non-Liberian Africans.

Total employment in the car repair industry represents about 5 per cent of the total employment in industry, a proportion equal to that of its wage bill to the total industrial wage bill.

The building materials industry includes brickwork, cement block factories and cement pipe factories.

There are only two commercial brickworks in Liberia. One of these operates in Monrovia, on Bushrod Island, whilst the second is an annexe to the Firestone construction division.

The enterprise situated in Monrovia is owned by a construction enterprise which also owned a carpentry section and a cement tiles plant.

Full and hollow bricks are produced, in sizes from 2" x 4.5" x 9.5" to 6" x 4" x 11.5". The quality of these products is modest, owing to the baking temperature. The brick oven was installed in 1961, for an initial capacity of 6,000 bricks/day. The capacity has since decreased, owing to the aging of the oven, to about 5,000 bricks/day.

The clay used by the enterprise is extracted from a quarry situated at about a distance of two miles, north of Stockton Creek, as well as from quarries located in the neighbourhood of B.L.W.A. The brick oven uses coconut husks as fuel, which are supplied from resources located in the neighbourhood.

The production is destined to the own requirements of the construction enterprise owning the brickworks as well as the construction enterprises of the Monrovia area engaged in building houses for middle income population.

The annual capacity of about 1,800,000 to 2,000,000 bricks is utilized in a proportion of some 35 per cent and the annual value produced is of some \$90,000.

The Firestone brickworks, situated in Harbel produces some 600,000 bricks per year, solely for the construction programme carried out by Firestone. The value of Firestone's production is of about \$30,000/year.

Both brickworks employ some 48 persons of which 4 are foreigners.

Cement blocks are produced by some 67 plants, most of which are situated in Monrovia.

About 60 of these establishments employ under 10 persons whilst the rest employ 10-20 persons.

The cement block factories are in general poorly equipped, with the exception of a few major units endowed with vibratory machines. In the majority of the establishments the forming of the cement blocks is carried out manually.

Two large units employing 40 workers and equipped with electrical vibration machines satisfy about 30 per cent of the total market.

The cement block factories are located in the whole of the Monrovia area, including the centre, Bushrod Island, Sinkos and Congo Town.

The production consists of full and hollow blocks with a width of 4, 6 and 8 inches, and a height of 10 inches. About 75 per cent of the production consists in hollow cement blocks.

The quality of the blocks manufactured by the bigger, modernly equipped enterprises is satisfactory. The smaller units have a relatively high percentage of faulty blocks, but in general, during the recent years of construction boom, the utilization of the capacity of these enterprises has been above 90 per cent. The total capacity of the cement block factories is estimated at about 10 million blocks/year. In 1964, owing to the slump in the construction activity, business has been affected unfavourably.

The value of the annual production of the cement block factories is in the range of \$1,000,000.

These enterprises employ some 345 workers or 2 per cent of the total number of workers of the industrial sector, but the wage bill for these units represent less than 1 per cent of the total wage bill in industry, owing to the low qualification of the workers.

Cement pipes are manufactured by two establishments in Monrovia. One of these is owned by a foreign construction enterprise, while the second establishment is part of an enterprise which also produces cement blocks and concrete tiles.

~~Two-part~~ moulds are used to produce pipes with a diameter of 4, 8, 20, and 40 inches. Both establishments employ 5 Liberian workers.

The capacity of the units is estimated at 7,500 yds/year. Only about 40 per cent of this capacity is used and the total production amounts to some \$10,000 annually.

Cement tiles are manufactured in 6 enterprises situated on Bushrod Island and U.N. Drive with the exception of one unit located in Congo Town.

One enterprise is modernly equipped and has the possibility to produce high quality tiles. The quality of the products produced by the other units is not equivalent to that of imported tiles. Consumers have complained frequently about insufficient colour-fastness and insufficient resistance to shock.

Three of the six plants are owned by construction enterprises which can utilize most of the production for their own programme. During 1964 prices dropped considerably in order to meet the competition from imported tiles.

The cement ~~tile~~ plants employ 75 persons, of which 8 are non-Africans.

The total capacity of the industry is of 2,500,000-3,000,000 tiles per year. About 60 per cent of this capacity is utilized and the value of annual production is in the range of \$160,000.

The building materials industry consists of some 77 enterprises and employs about 470 persons. Employment in the building materials industry represents some 3 per cent of the total for the industrial sector, whereas the wage bill amounts to about 1.5 per cent of the total wage bill for industry. The annual value of production is in the range of \$1,300,000 and the total investments in fixed assets amounts to about \$700,000.

The chemical industry in Liberia is represented only by an oxygen and acetylene plant, three soap factories and an enterprise for the production of cosmetics.

Oxygen and acetylene are produced in an enterprise owned by a Liberian concern which engages in fishing, building constructions, manufacture of building materials and the production of soap.

Oxygen is produced through the compression and rectification of air, and acetylene is produced from imported carbide.

The plant employs some 6 persons of which 2 are non-Africans. The quality of the oxygen and acetylene produced is satisfactory and meets the requirements of the Liberian consumers.

Recently the plant has imported equipment for the manufacture of nitrogen.

The capacity of the oxygen installation is of about 6,500,000 cu.ft./year (26,000-27,000 cylinders/year). The capacity is utilized in a proportion of about 80 per cent and the annual sales are in the range of \$130,000-140,000/year. This year the capacity is to be doubled with new, imported equipment.

The capacity of the acetylene plant is in the range of 2,100,000 cu.ft. per year. The production capacity for acetylene is also utilized in a proportion of some 80 per cent and the total annual value produced is of \$30,000-40,000.

Soap production is at the moment limited to blue mottled soap. One establishment situated in Harbel, is owned by the Firestone enterprises, and produces blue mottled soap for the Firestone employees.

Soap manufacturing is the object of production of three enterprises. In Monrovia, a new enterprise, endowed with modern equipment is not producing at this moment but is capable of producing both toilet and laundry soap. This factory is Liberian owned.

A third enterprise, also located in Monrovia, manufactures only mottled soap, and is probably the largest manufacturer for this production in Liberia.

A Spanish owned soap plant ceased production in 1963. It was rudimentarily equipped and also produced only blue mottled soap.

The quality of the blue mottled soap produced in Liberia is modest. Blue soap is sold to all categories of the population and represents by far the most largely consumed soap products.

The total capacity of the existing enterprises is in the range of 800-1,000 tons/year. At present only about 50 per cent of this capacity is used and the value of production is of around \$150,000.

The soap industry employs about 35 persons of which 3 are foreigners.

Pharmaceuticals and cosmetics are the object of one enterprise. The unit is situated on Bushrod Island on an area of approximately two acres. The production programme includes certain antiseptics and hair creams. In recent years various attempts were made to reactivate this production but with no tangible results.

Tyre retread is carried out by two enterprises. One of the units is owned by the U.S.T.C., a Firestone subsidiary.

Both establishments are located in Monrovia and are modernly equipped. The two enterprises cannot be considered as competing, since the production programme of one of them is based mainly on the retread of tyres for passenger cars, while the second enterprise

specializes in the retread of truck tyres and tractor tyres. The retreads are of good quality and the clients are the taxi companies and the construction enterprises. The cost of a retread tyre is about 50 per cent of that of a new tyre.

The capacity of the tyre retread establishment is of about 37,000 tyres for passenger cars, 19,000 tyres for trucks and 3,500 tyres for caterpillars/year. At present the capacity is used only in a proportion of 40 per cent and the total volume of business is in the range of \$600,000/year. However, owing to the good quality and advantageous pricing of the products, the business is expanding continuously.

The tyre retread establishments employ 42 persons of which 5 are non-Africans.

Electric repairs are carried out by 18 workshops situated in Monrovia. The production programme includes repairs of refrigerators and air conditioners.

One major enterprise employs some 275 persons and engages in telephone installations.

Because of the shortage of qualified manpower the quality of the repairs is often modest. Moreover the price of electrical maintenance is relatively high.

The electrical workshops employ about 450 persons of which 77 are non-Africans and 4 non-Liberian Africans.

The major enterprises are well equipped with machinery and spare parts.

Manpower fluctuation is very high in enterprises executing electrical repairs, since workers who have acquired a certain degree of qualification tend to establish themselves on their own. Private electricians compete with the established enterprises and it is estimated that about 80 per cent of the repairs in private houses are carried out by independent electricians.

The capacity of the electrical repair shops is satisfactorily utilized. The value of annual production of these enterprises is in the range of \$520,000.

Employment in electrical repairs establishments amounts to about 3 per cent of the total manpower employed in industry. The total annual wage bill represents about the same proportion out of the total wage bill for industry.

Office machine repairs are undertaken by three workshops situated in Monrovia. These enterprises are owned by Europeans and employ between 6 and 15 workers each. These units have an estimated annual capacity of 6,000 repairs. The capacity is satisfactorily utilized and the value of annual production is in the range of \$180,000.

Laundry and dry cleaning work is the object of five enterprises. Three of these are owned by Lebanese nationals and two by Liberians. All the laundries and dry cleaners are situated in Monrovia. With one exception, all the laundries and dry cleaners are endowed with relatively modern mechanical equipment.

The quality of the services is in general satisfactory.

The laundries and dry cleaners employ some 36 persons of which 4 are non-Africans. The annual capacity is of some 280 tons of laundry. The capacity is used in a proportion of 80 per cent and the value of annual production is in the range of \$180,000.

Gold and silversmithing is the object of 23 establishments. One unit is owned by an Armenian, 4 are owned by Lebanese and 18 are owned by Africans.

The foreign-owned enterprises, catering mainly to the expatriate population are situated in the centre of the town and are partially engaged in the sale of imported jewellery besides the local production. The same jewellers and goldsmiths also undertake watch repairs.

The other 18 enterprises, belonging to Liberians and non-Liberian Africans cater mainly to the Liberian population. These enterprises are situated mainly in the peripheral areas of Monrovia and produce chains, rings, earrings, etc. A few of these enterprises also undertake watch repairs.

The gold and silversmiths employ some 45 persons of which 3 are non-Africans and 6 non-Liberian Africans.

The value of the annual production is about \$400,000.

Ivory carving is the object of 4 workshops situated in Monrovia. The owners as well as the workers are mainly Mandingos. All the workshops are situated in the waterside area, usually in relatively small rooms of 10-30 sq. yds.

The ivory carvings are destined mainly to the tourist trade and sell for relatively high prices. Most of the ivory used for carvings and jewellery is of Liberian provenance. The ivory carving shops employ some 12 persons of which 2 are non-Africans and 10 Mandingos. The value of annual production is in the range of \$30,000.

Construction of buildings and roads constitutes one of the major industries in the country. It has been generally considered preferable to separate this activity from the rest of the industrial sector, owing to the considerable fluctuation in the volume of business and number of persons employed from year to year.

In 1962-1963 there were 70 construction enterprises, the majority of which were owned by foreigners. Total employment in this sector was 14,000 persons, a little less than the total industrial sector excluding construction. The annual wage bill was in the range of \$12,700,000, about 20 per cent less than that for industry.

The construction enterprises accounted for over \$10 million of imports, or one-sixth of the imports of the industrial sector. The value of annual production of the construction sector was approximately \$3 million, nearly 90 per cent of that of industrial production. The fixed capital asset of this branch amounted to some \$4,600,000.

Government constructions represented in 1962 the major part of the construction business with 47 per cent of the total value. Construction for corporations and other economic organizations totalled 42 per cent of the value of construction, whilst the value for private construction was in the range of 11 per cent. In 1962 one of the major items of Government construction was the Executive Mansion.

Up to 1963 the construction activity increased steadily. In 1964 and the first half of 1965 a marked decrease of construction activity is due to the situation of economic austerity.

6 - Significant Enterprises

Examination of the structure of the industrial sector confirms the initial assumption that a small number of enterprises supplies a major part of most indicators. Appendix 3 indicates that the sector, as defined in this paper and excluding most of the one-man enterprises, consisted in 1963 of 375 establishments. It is now apparent that a selection of only 22 enterprises listed in Appendix 5 "Significant Enterprises" or 6 per cent of the total number, accounts for a considerable majority of the dimension of each aggregated indicator of the industrial sector.

It is practical to include in the "significant sector" the diamond mining activity, although it consists of a large number of very small units. The diamond mining establishments permit a relatively easy global statistical follow-up through the Bureau of Natural Resources which issues the licenses for miners and prospectors and appraises the shipments for export. If the diamond mining activity is included in the significant sector, the following proportions of the aggregate indicators for industry are obtained:

- 77 per cent of the total number of persons employed
- 85 per cent of the total wages paid
- 96 per cent of the total imports
- 100 per cent of the total exports
- 93 per cent of the total fuel and power used

- 77 per cent of the total production in 1961
- 79 per cent of the total production in 1962
- 95 per cent of the total fixed assets in 1962

The list of significant enterprises for 1964 would include the following 10 enterprises which did not exist in 1962. Mission, Canada Dry, 7 UP, A.R.I.L., Marinoni, ICC Tiles, ICC Bails, Farrah Soap, Krueger Electrical Appliances, Parker Paints.

It is now fairly simple to actualize the totals of the significant sector for 1964. Thus, considering 1964 as the base year for a projection, it is sufficient to project 32 enterprises and a global activity (diamonds) to obtain a forecast (or a plan, as the case may be) for 77-100 per cent of each major indicator, of the existing sector. The "rest of the sector" can then be projected either globally, on the basis of a statistical formula or, preferably, on an estimate for each branch of the sector. In brief, to project the activity of some 400 enterprises, it is sufficient to project accurately 32 enterprises.

The new enterprises, to be created during the planning or forecasting exercise would have to be projected individually, on the basis of the respective feasibility studies.

This situation also points towards a relatively simple statistical procedure: in order to obtain accurate data on the industrial sector it is sufficient to include in the statistical coverage only the 32 significant enterprises^{1/} and to ensure that any new entries into the sector or withdrawals are duly accounted for.

The majority of the industrial enterprises are situated in Monrovia. Appendix 4, "Industrial Map of Monrovia" gives an indication of the location of the various industries within the capital.^{2/}

^{1/} Coverage of the diamond sector is achieved through the Bureau of Natural Resources and Surveys.

^{2/} Attelle Institute Report.

REPUBLIC OF LIBERIA
OFFICE OF NATIONAL PLANNING
Bureau of Statistics
MONROVIA

APPENDIX I

MANUAL FOR THE COMPLETION OF FORM NOS. E 1 - E 4

A. The Objective of the Survey

Many of the questions arising in the course of development programmes relate to the character and level of key productive activities in terms of increased output through the most effective use of available resources and the expansion of the amount of capital. This survey, the first of its kind in the country and one of a series of studies, seeks to collect, among other things, needed data on (i) the structure, level and trend of important kinds of production; (ii) capital employed in these activities; and (iii) the value and the quantity of the goods that are produced and consumed.

B. The Purpose of this Manual

The purpose of this manual is to help respondents to complete properly and uniformly forms E 1 through E 4 used in this survey.

C. How to Complete the Forms

Form E 1: The primary purpose of this form is to identify the "Establishment" which is the statistical unit used in the survey. The establishment may be defined as a single physical location where goods and services are produced under a single ownership or control. When a single physical location comprises two or more units which are engaged in distinct or separate activities producing homogeneously distinct goods and services (such as a company producing in one

location soap, lumber, soft drinks, rubber) and have separate payrolls, each unit constituting an establishment.

Thus the criteria for identifying an establishment are:

- (a) Single physical location: Thus the Harbel group and Harper group of operations of Firestone Plantations Company will be considered two separate establishments, although these physical groups may be under one ownership. The identification criterion is physical location.
- (b) The carrying out of distinct or separate activities with different industry classifications: For purposes of this study, economic activities have been classified primarily in accordance with the products and services produced. Each unit within the business firm, producing distinct homogeneous products and services, constitutes an establishment. Thus the production of natural rubber is considered distinct and different from the production of furniture, construction of buildings and the production of tiles, etc.

However, the primary production, such as natural rubber, may and does require ancillary, supporting activities such as the operation of a power plant, the construction of roads, the operation of vehicles. Such activities are in support of the primary production of rubber and should be considered as part of the production of natural rubber. The principal classification of the establishment is thus "natural rubber". If an ancillary service serves two or more establishments, include data on the ancillary service in the establishment which the ancillary service serves most.

- Item 1. Enter in the space provided the name of the company or firm.
- Item 2. If the firm has a head office located outside Liberia, enter in the space provided the head office address abroad.
- Item 3. Enter in the space provided the head office address in Liberia. This may be the name of the town, street or post office box.
- Item 4. From the definition of establishment above, enter in the space provided the number of establishments within the firm.

Item 5. Enter in the spaces provided the industrial classification of the establishment. To help in the completion of this item, a classification of industrial activities with index is enclosed herewith. Also, wherever establishments within the company are known by the Bureau of Statistics, the industrial classification is specified for the company. Even so, the company should verify to ensure whether or not the listing is correct and comprehensive.

Item 6. Enter in the spaces provided against the relevant listing in item (5), the main product of the establishment. Where the listing in item (5) is "tile manufacture", enter against it in item (6) "tiles".

Form E 2: The purpose of this form is to collect general data on each of the establishments listed in item (5) of Form E 1. Use one Form E 2 for each establishment.

Item 1. Enter in the space provided the industrial classification of the establishment.

Item 2. Enter in the space provided the main product of the establishment.

Item 3. Enter in the space provided the year the establishment commenced operations (for establishments before 1955). For establishments which began operations after 1955, enter the day, month and year.

Item 4. Enter in the space provided the nationality of shareholders and the value of shares, stating whether they are common or preferred in each case.

Item 5. Enter in the space provided the annual capacity of the establishment, giving the quantity and unit of quantity. If the "quantity" is inapplicable, as in furniture making where the production is heterogeneous (chairs, desks, tables) cross out "volume" and write "value" and enter the value. The annual

capacity is the standard yearly production or the total production in a well organized and managed establishment. Count here capacity actually installed. Expansion currently in process should not be included.

- Item 6. Enter in the space provided the total installed power in kilowatts.
- Item 7. Enter in the space provided (a) the total wages (b) total salaries and (c) the total value of fringe benefits. The value of fringe benefits is the cost to the company of things as rice, accommodation, clothing, free education and medical facilities supplied to workers and their dependents free or at values less than market prices. If the workers or their dependents pay certain amounts less than the cost to the company of the goods or benefits supplied, enter only the amount representing the difference which is not recuperated between the company's cost and the cost charged by the company to the workers or their dependents.
- Item 8. Enter in the space provided the value (cif) of commodities imported in calendar year 1962 for use in current production. Do not count imports arising from investment or expansion activity.
- Item 9. Enter in the space provided the value (cif) of commodities imported used in production during calendar year 1962.
- Item 10. Enter in the space provided the value of locally produced goods purchased in calendar year 1962 for current production use.
- Item 11. Enter in the space provided the value of locally produced goods which were used in production during calendar year 1962.
- Item 12. Enter in the space provided the value of locally purchased services other than those shown in item (7) of Form E 2.

- Item 13. Enter in the space provided rents paid in calendar year 1962.
- Item 14. Enter in the space provided net interest paid in calendar year 1962.
- Item 15. Enter in the space provided the value of fuel and power used in calendar year 1962.
- Item 16. Enter in the space provided royalties and/or stumpage fees paid in Liberia.

Form E 3: The purpose of this form is to collect data on goods produced by the establishment. If the goods are not homogeneous but belong to the same industrial classification, use one copy of Form E 3 for each commodity produced by the establishment. Example: one establishment belongs to the industrial classification "non-alcoholic manufacture" but produces "Orange Frutta", "Ginger Ale" and "Muscatella". These are considered distinct commodities and for each of the commodities use one sheet of Form E 3.

- Item 1. Enter in the space provided the name or description of the commodity, for example, iron ore, "Fanta", blocks, logs.
- Item 2. Enter in the space provided the unit of quantity of the commodity, for example, imperial gallon, number, long ton.
- Items 2&5. Enter in the spaces provided along the relevant year the quantity and value of the commodity specified in item (1) produced by the establishment, and exported in calendar year 1962.
- Items 6&7. Enter in the space provided along the relevant year the quantity and value of the commodity specified in item (1) produced by the establishment and sold locally in calendar year 1962.

Items 8&9. Enter in the space provided for the relevant year the quantity and value of the commodity specified in item (1) previously produced by the establishment and in stock, at the beginning of the calendar year.

Items 10&11. Enter in the space provided along the relevant year the quantity and value of the commodity specified in item (1) produced by the establishment and in stock at the end of the calendar year.

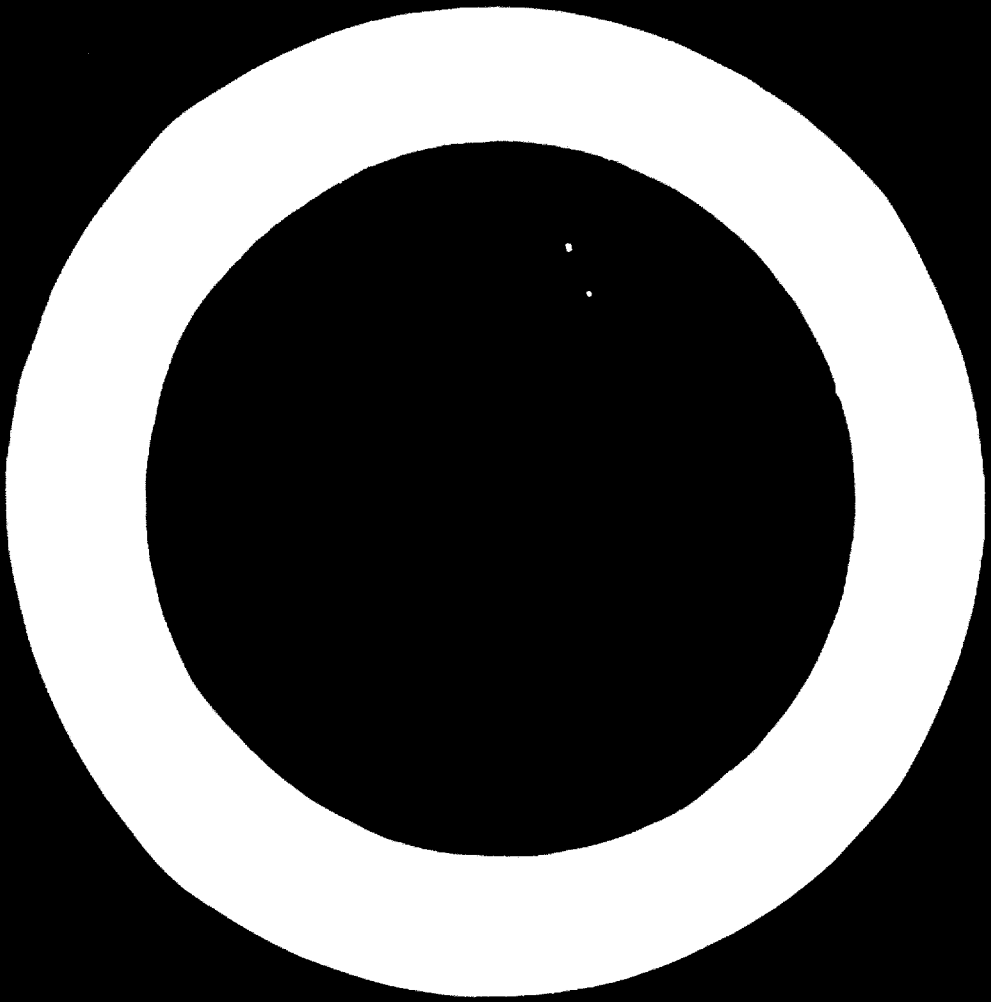
Items 12&13. Enter in the space provided along the relevant year the total quantity and value of goods produced in the calendar year. The total value of production of goods in the calendar is the sum of:

- (a) Exports, if any, in the year
- (b) Local sales in the year and/or services rendered to other establishments
- (c) Stocks of finished goods at the end of the calendar year less the stocks of finished goods at the beginning of the calendar year.

Form E 4: The purpose of this form is to collect data on the value of fixed assets used more or less permanently in the conduct of the business of the establishment rather than held for consumption or resale. To differentiate them from other categories of assets, fixed assets should include only objects, such as buildings, land, vehicles, technological equipment, tools amortized in more than one year and the value of which exceeds \$50. The value of fixed assets should relate to December 31, 1962 and should include the cost of installation, fees and taxes but should exclude financing costs.

Item 1. List in column (1) all the fixed assets of the establishment. Where 5 trucks, for example, are purchased during the same year, they should be listed as a group on one line. But if two trucks were purchased in different years each truck should be listed separately in column (1) because the year of purchase is different.

- Item 2. Enter in column (2) against the particular type of fixed assets listed in column (1), the year of purchase of the particular asset.
- Item 3. Enter in column (3) the initial purchase value of the particular type of assets listed in column (1). Establishments which commenced operations after January 1, 1960 need not complete columns (4, 5, 6, 7). Only firms which began operations before January 1960 should complete columns (4, 5, 6, 7).
- Item 4. For establishments the book value of whose fixed assets is more than \$100,000 and which commenced operations before January 1, 1960, enter in column (4) the accounted depreciation of each type of fixed assets listed in column (1).
- Item 5. For establishments the book value of whose fixed assets is more than \$100,000 and which commenced operations before January 1, 1960, enter in column (5) the accounting value on December 31, 1960 of each type of fixed assets listed in column (1). The accounting value is obtained by subtracting column (4) from column (3). If the asset has been completely depreciated in the company's books but is still in use, enter the value "zero".
- Item 6. For establishments the book value of whose fixed assets is less than \$100,000 and which commenced operations before January 1, 1960, enter in column (6) the value at replacement cost used of each type of fixed assets listed in column (1). The replacement cost new is that at which the respective assets could be purchased new from the supplier.
- Item 7. For establishments the book value of whose fixed assets is less than \$100,000 and which commenced operations before January 1, 1960, enter in column (2) the value at replacement cost used of each type of fixed assets listed in column (1). The replacement cost used is that at which the respective assets could be sold to an enterprise in their used state. The value at replacement cost used is based on an empirical evaluation of the degree of usage of the fixed asset.



APPENDIX 2
STRUCTURE OF THE INDUSTRIAL SECTOR^{1/}
(Study of Industrial Establishments)

Code	Classification	No. of Units	Emplo- yees	Wages & Salaries \$	Imports & Exports \$	Fuel & Power Used \$	Produco- tion 1961 \$	Produco- tion 1962 \$	Exports 1961 \$	Exports 1962 \$	Fixed Assets \$
11	Iron Ore Mining	4	8,788	10,421,445	57,451,318	1,990,977	28,580,560	29,131,034	27,698,355	29,620,727	111,906,471
13	Diamond Mining	3	1,200	1,400,000	-	-	2,200,000	4,600,000	2,223,097	4,600,000	1,000,000
14	Rock Quarries	5	300	123,000	-	42,000	550,000	550,000	-	-	450,000
	Production of Electric Power	7	380	260,000	-	593,200	1,300,000	1,375,000	-	-	7,807,000
	Foodstuff Manufacturing (of which:	65	577	365,433	727,109	36,751	924,186	1,471,977	-	-	3,552,276
	Bakeries	4	103	55,191	229,308	10,859	308,323	285,995	-	-	58,156
	Coffee Roasteries	2	6	2,280	2,955	744	15,400	15,400	-	-	10,150
	Ice Cream Factories	3	17	14,720	36,486	5,400	50,000	50,000	-	-	86,104
	Reconstituted milk plants	1	32	31,800	45,000	3,850	-	120,000	-	-	82,857
	Breweries	1	166	116,066	98,123	12,958	62,951	179,838	-	-	2,565,009
	Distilleries	50	140	65,000	2,655	4,700	112,000	109,000	-	-	126,000
	Soft drinks plants	2	52	33,576	307,237	1,240	252,512	585,744	-	-	330,000
	Palm Oil refineries	1	20	19,800	8,000	200	80,000	80,000	-	-	80,000
	Cold Stores & Ice producers	2	32	31,000	-	-	80,000	80,000	-	-	250,000
	Plastic goods plants	1	3	4,800	22,000	-	33,000	33,000	-	-	10,000
	Furniture & wearing apparel	22	133	76,567	87,192	1,928	219,750	228,500	-	-	23,792
22	Shoe repair shops	6	24	10,000	-	-	40,000	40,000	-	-	7,700

^{1/} When not otherwise stated figures were for 1962.

INDUSTRIES (continued)
 MANUFACTURING AND MINING SECTOR
 (of Industrial Establishments)

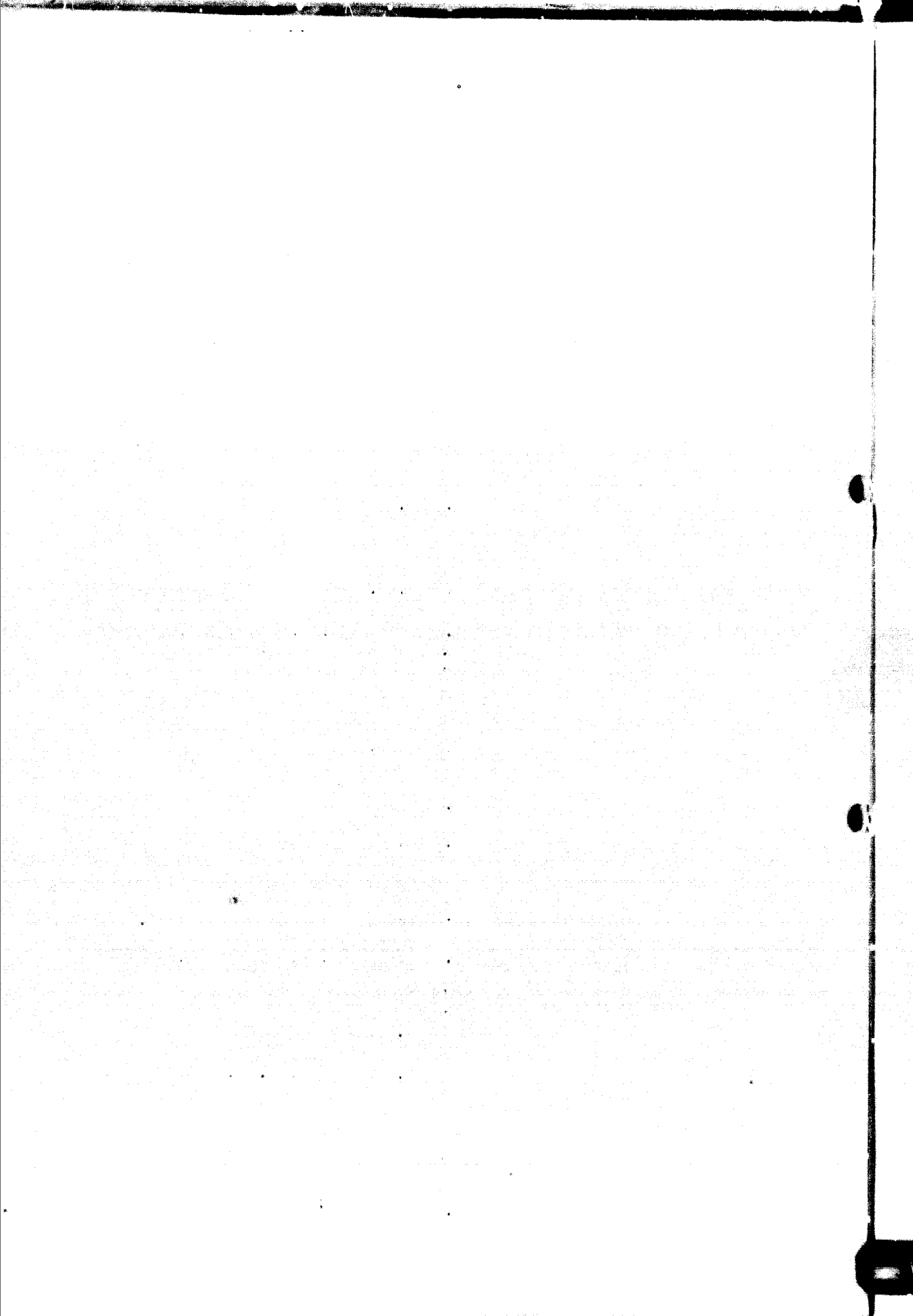
	No. of Units	No. of Employees	Wages & Salaries \$	Imports & Exports \$	Fuel & Power Used \$	Production 1962 \$	Production 1961 \$	Exports 1962 \$	Exports 1961 \$	Fixed Assets
Tailor shops	15	80	46,000	-	1,300	90,000	90,000	-	-	8,000
Trousers & shirts factory	1	29	20,567	87,192	628	89,750	98,500	-	-	8,092
Lumbering & Timber processing of which:	65	2,609	1,674,618	72,076	174,984	2,410,421	2,363,505	-	-	1,927,253
Lumbering & saw mills	16	2,237	1,356,618	72,076	174,984	1,870,421	1,823,505	-	-	2,337,253
Carpentry shops	23	215	204,000	-	-	330,000	330,000	-	-	1,927,253
Furniture shops	26	157	114,000	-	-	210,000	210,000	-	-	245,000
Printing presses	13	200	200,000	-	-	1,320,000	1,320,000	-	-	165,000
Metal workshops	14	135	106,000	45,000	13,000	850,000	850,000	-	-	500,000
Garages	39	750	700,000	2,120,000	50,000	5,300,000	5,300,000	-	-	100,000
Building materials factories of which:	77	473	222,700	-	6,000	1,290,000	1,290,000	-	-	860,000
Brickworks of which:	2	48	27,000	-	6,000	120,000	120,000	-	-	711,000
Cement blocks factories	67	345	142,000	-	-	1,000,000	1,000,000	-	-	300,000
Cement pipe factories	2	5	2,700	-	-	10,000	10,000	-	-	260,000
Cement tiles	6	75	51,000	-	-	160,000	160,000	-	-	1,000
Commercial Sections	5	31	29,000	37,000	300	150,150	239,000	-	-	150,000
Oxygen & acetylene	1	8	16,000	24,000	-	166,000	166,000	-	-	340,000
Soap factories	4	23	13,000	13,500	300	84,150	73,650	-	-	150,000
Tyre retread & vulcan- ization	2	42	41,300	211,658	9,157	23,798	281,428	-	-	190,310
Repair shops of which:	21	475	426,000	264,000	1,500	700,000	700,000	-	-	360,000
										180,000

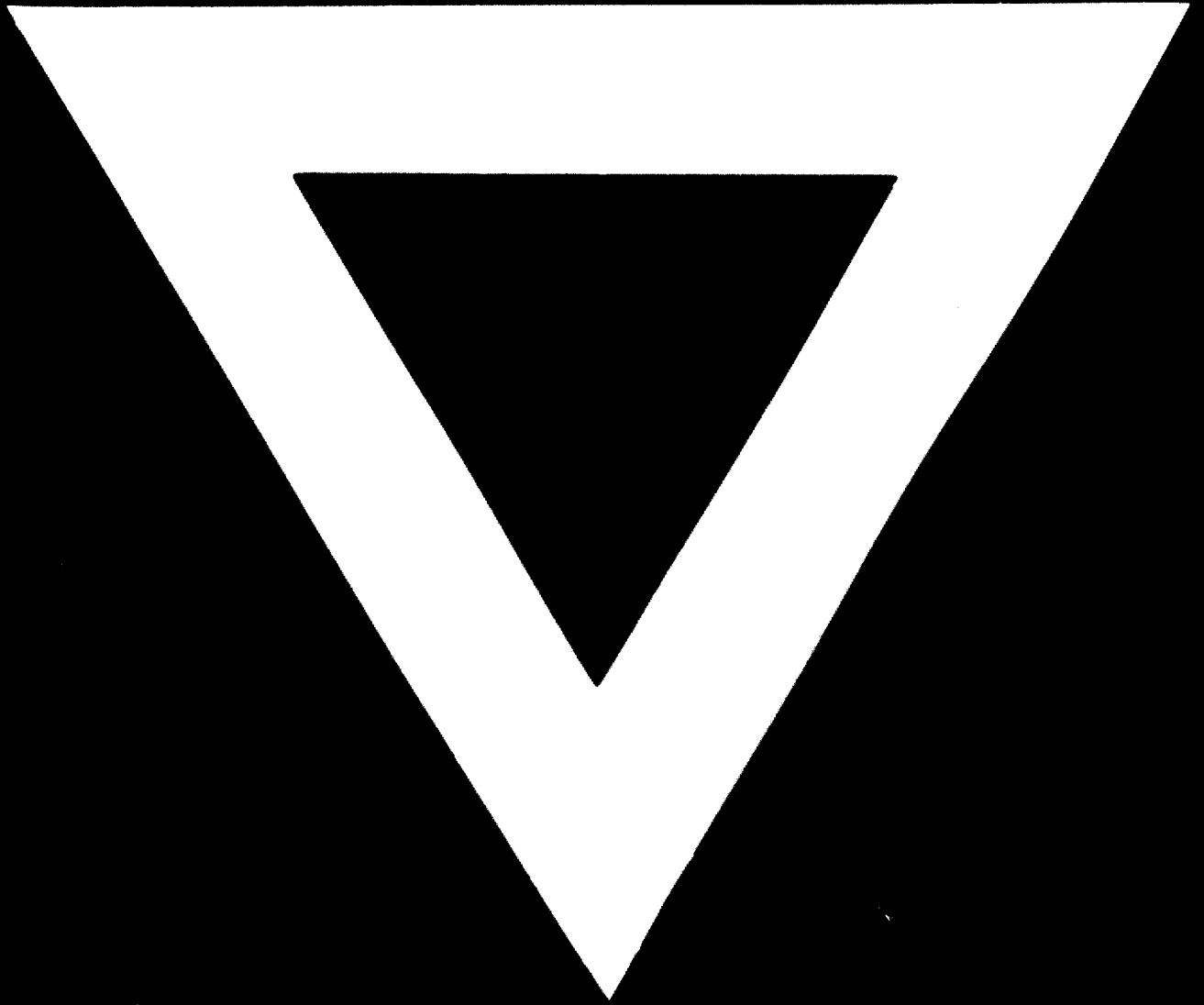
1/ Modern tailor shops. A further 285 shops are artisanal one-man enterprises.

APPENDIX 2 (cont'd)
 STRUCTURE OF THE INDUSTRIAL SECTOR
 (Study of Industrial Establishments)

	No. of Units	No. of Empl- ees	Wages & Salaries \$	Imports & Used \$	Fuel & Power	Produc- tion 1961 \$	Produc- tion 1962 \$	Exports 1961 \$	Exports 1962 \$	Fixed Assets
Electric repair shops	16	450	400,000	210,000	1,500	520,000	520,000	-	-	150,000
Office machine repair shops	3	25	26,000	54,000	-	180,000	180,000	-	-	30,000
Dry cleaning & laundry	5	36	36,000	-	-	180,000	180,000	-	-	230,000
Gold & Silversmiths	23	45	30,000	-	-	400,000	400,000	-	-	3,500
Ivory Carving	4	12	10,000	-	-	30,000	30,000	-	-	600
Total excluding construc- tion	375	16,189	16,126,863	61,417,853	2,919,797	46,561,579	50,344,098	29,921,452	34,220,747	130,372,202
Constructions	70	14,800	12,700,000	10,500,000	370,000	40,000,000	42,000,000	-	-	4,507,000
Total including Constructions	445	30,989	28,826,863	71,917,853	3,289,797	86,561,579	92,344,098	29,921,452	34,220,727	134,879,202

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