BUDAPEST

AN INDUSTRIAL-GEOGRAPHICAL APPROACH

AKADÉMIAI KIADÓ, BUDAPEST

BUDAPEST · AN INDUSTRIAL- GEOGRAPHICAL APPROACH

Imre Bencze—Erzsébet Tajti

BUDAPEST · AN INDUSTRIAL-GEOGRAPHICAL APPROACH

Studies in Geography in Hungary, 10

Budapest occupies a rather unique position among the European Capitals: it has attracted over one-third of Hungary's industrial population. This peculiar situation certainly arrests the interest of economic geographers who make serious attempts to investigate with the special methods of their discipline the questions relating to the historical development of the Hungarian Capital's industry, its structure and its impact on the economic growth of the rest of the country.

Part One of the present book treats statistical data with a view to elucidating the areal distribution of Budapest industry, breaking down the four main branches (machine-, textile-, chemical- and food industry) by districts. *Part Two* examines the role the rapid population growth plays in the changing pattern of this new industrial agglomeration. It attacks such interesting questions, among others, as the distribution of population according to working place and place of residence, or the expansion of labour-force attraction, its velocity and territorial segmentation.

AKADÉMIAI KIADÓ
Publishing House of the Hungarian Academy of Sciences
Budapest

BUDAPEST

AN INDUSTRIAL-GEOGRAPHICAL APPROACH

STUDIES IN GEOGRAPHY IN HUNGARY, 10

Geographical Research Institute,
Hungarian Academy of Sciences Budapest

BUDAPEST

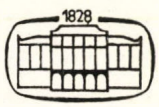
AN INDUSTRIAL–GEOGRAPHICAL APPROACH

by

IMRE BENCZE

and

ERZSÉBET V. TAJTI



AKADÉMIAI KIADÓ, BUDAPEST 1972

Edited by

BÉLA SÁRFALVI

Translation edited by

P. A. COMPTON

The Queen's University of Belfast

Northern Ireland

Printed in Hungary

CONTENTS

PART ONE

PART TWO

PART ONE

THE INDUSTRIAL ROLE OF BUDAPEST

by

IMRE BENCZE

PREFACE

Notwithstanding the fact that the capital of Hungary occupies an outstanding place in the political, economic and cultural life of the country, the city itself, and its industry has received little attention by economic geographers after the Second World War.

The study of the economic geography of Budapest is an exacting and multifaceted task. As an exhaustive discussion of the subject is impossible within a relatively restricted scope, present-day problems are stressed in this book. Therefore a detailed description of the development of industry in Budapest is not given although certain phases of the economic history necessary for an understanding of the actual situation are highlighted. Additionally, the medium and long-term prospects for industrial development in Budapest are touched upon.*

* Subject discussed by E. V. Tajti in "The Labour Attraction of Budapest", in the present work.

I. A HISTORICAL SURVEY

1. BEFORE THE FIRST WORLD WAR

The handicraft industry developed relatively early in Hungary. During the initial period of the foundation of the Hungarian State in the 10th and 11th centuries, craftsmen settled in the present territory of Budapest. From the 14th century on the craftsmen of Buda placed themselves directly under the King's patronage and formed guilds which became most powerful during the reign of King Matthias in the second half of the 15th century. By that time the goldsmiths, gunsmiths, leather- and wood-working artisans of Buda had been famous all over Europe. Subsequent development was checked, however, by Turkish raids, and both Buda and Pest were occupied by the Turks in 1541.

By the end of the 17th century the reconstruction of Buda and Pest, liberated after 150 years Turkish occupation, had begun. In 1720 the inhabitants of the town numbered about 12,000, and although growing to 95,000 by the end of the 18th century, was nearly four times smaller than Vienna.* In this period Buda played an administrative role, as containing the residence of the Palatine and housing the commissioner's council. Paralleling this was the expansion of the agricultural production in the Lowlands and with it the commercial activity of Pest-Buda, proof of the growing economic significance of the city. Despite a policy of economic discrimination on the part of the Court in Vienna, the first textile mills and finishing establishments needing large quantities of water appeared in Ó-Buda** during this period.

Nevertheless, the main importance of Buda and Pest continued as the administrative and military centre of Hungary, an industrially extremely backward part of the Hapsburg Empire. The economic function of the town was primarily a commercial one, with industry still in its initial stages of development.

In the unfolding of the economic life of the country and of the industry of Pest-Buda, the "reform-era" between 1825 and 1848 was to play a decisive role, with Lajos *Kossuth* and István *Széchenyi*, the two great Hungarian statesmen of the 19th century, in the lead. The former excelled by claiming political independence for Hungary and also through his campaign for boosting the products of Hungarian industry. Széchenyi, on the other hand, not only gained fame by fostering Hungarian science and fine arts, through the

* Cf. Magyar Statisztikai Szemle (Hungarian Statistical Review), Budapest 1941, p. 411.
** Old-Buda (Ofen), an ancient settlement north of Buda.

foundation of the Hungarian Academy of Sciences, and support of theatre in the Hungarian language, but also by promoting industrial establishments for ship-building and flour-milling and by urging the organization of industrial exhibitions on a national scale.

The defeat of the 1848–1849 reform movement paralysed further industrial development. The government in Austria, looking for rapid industrialization, regarded Hungary merely as a source of raw materials and a market for finished goods, and in consequence deliberately hampered the development of an indigenous industry and obstructed the business of existing industrial establishments. Some stimulus to development in Pest-Buda was brought about by railway construction which started at the end of the fifties. By 1870, however, fewer than 16 per cent of the steam-engines in use were made in Hungary, the others being imported particularly from Austria.*

The greatest drawback in this arrangement was the forced dependence of Hungary on Austria. Political and economic leadership in the Hapsburg Empire was concentrated in the hands of the Austrian bourgeoisie, which in 1867 was compelled—for internal and foreign reasons—to make a compromise deal with the representatives of feudal Hungary.

From then on, the development of Hungary can be regarded as being synonymous with that of Budapest. The central position of the capital was enhanced by the widespread construction of railways, more than 4000 km being built between 1867 and 1873 alone. Heavy industrial plants connected with railway construction were established in Budapest, while part of the food industry, and the processing of agricultural products was likewise concentrated there. Budapest also became the banking centre of the country, while government sponsored building schemes were located primarily in the capital.

At the time of the 1869 census, with an enumerated population of 280,000, the Hungarian capital ranked seventeenth among the great cities of Europe. The Pest-side with its 200,000 inhabitants was three times larger than Buda, while the total population within the area later to become "Greater Budapest" amounted to about 300,000.

In the years following the "Compromise", the majority of the industrially occupied population was engaged in the handicraft industry—the number of plants that might be regarded as factories being rather low. Nevertheless, the present day geographical pattern of industrial establishments in the capital, along the Danube and in the vicinity of the railway lines under construction was beginning to take shape.

A pseudo-independence won within the framework of the Austro-Hungarian Monarchy favoured the interests of the landlords who could now sell their agricultural products, above all wheat, in any of the markets within the empire free of customs levies. Some branches of manufacturing industry thus enjoyed a favourable position, particularly flour-milling, which developed on a large scale. The flour-mills of Budapest, with the most modern technical equipment in the world, ground five times as much wheat in 1870

* Pach, Zs.: Magyar gazdaságtörténet (Hungarian economic history), Budapest 1954, p. 157.

as in 1866. Iron rollers were first used in Budapest, and for a short time Hungary became the world centre for flour-milling on account of this. The 11 commercial steam-mills along the Danube were able to process one third of all the cereals produced in the country, their combined capacity in 1870 being equal to that of the 760 steam-mills in Austria. Yet even so, they offered employment to not more than 2900 workers.

One quarter to one third of the country's exports consisted of flour. Owing to a quickly developing technology, the roller milling of Budapest was able to maintain its position in Europe, while the quality of flour had improved from year to year.

Side by side with milling the engineering industry, which was aided by Austrian, German and partly French capital, grew into a dominant sector. The manufacture of rolling-stock became prominent in Budapest focussing the public road system and railway network of the country on Budapest and was mainly responsible for the corresponding concentration of industry, which in turn resulted in Budapest becoming, by the end of the century, the largest railway junction in Hungary, and indeed in South-Eastern Europe.

In the eastern half of Hungary the most important railway lines were built with a view to transporting agricultural products—in the first place of cereals —to the capital for processing. The rapidly developing railway network demanded large quantities of rails, rolling-stock, and locomotives, and to satisfy these requirements a number of plants were established. In the long term the "Ganz" and "Mávag" companies proved to be most competitive and steadily absorbed other less economic plants. "Mávag" was subsidized to a considerable degree by the Government being expected to meet the steadily increasing requirements of the Hungarian State Railways.

The construction of locomotives and rolling-stock proved the most successful sector of the engineering industry in Budapest. In spite of the fact that the first Hungarian steam-engines were not produced until 1873, 500 locomotives had left the plant by 1893 and the one thousandth was produced in 1896. "Ganz" established in 1853 had by 1866 exported 66,000 railway-wheel sets, mainly to Austria, Germany and Switzerland. In the eighteen-eighties "Ganz" was the sole company engaged in building railway carriages. By 1898, however, owing to favourable market conditions, five additional factories in the capital made arrangements for constructing rolling-stocks, and as a result the number of railway trucks produced in Budapest increased from 14,500 between 1881 and 1890 to 28,100 between 1891 and 1900.*

Budapest was also engaged in the construction of machinery for agriculture and flour-milling. Among these the roller-mill (world-patent applied for by the engineer András Mechwart of "Ganz") acquired world-wide reputation and became the starting point for advanced flour-milling technology.

A characteristic feature of the period was that factories did not specialize but worked to meet orders of any kind. Hungary being a country of agricultural character, the engineering plants in the capital tried to meet the requirements of agriculture, above all of the large estates. Among these the

* Source: Magyar Statisztikai Évkönyv (Hungarian Yearbook for Statistics). 1898, p. 90.

"Mávag", "Hofherr–Schrantz" and "Weiss Manfred" works should be mentioned. The last-mentioned factory, through orders for military equipment at the turn of the century, became one of the largest engineering works of the country. The "Röck" engineering factory where the first Hungarian steam-engine for powering threshing-machines was constructed in 1861 should be also mentioned.

Other industrial production lagged far behind the food- and engineering industries. The production of leather, textile, paper, glass, etc. goods was barely sufficient to meet internal requirements. Progress in Budapest was greatly hampered by keen competition from more advanced industrial centres such as Vienna, Brno, Prague and Liberec in the Austrian part of the Monarchy. She was able to compete successfully, however, in those branches where local raw materials were used, where a new manufacturing technology was employed as in the flour-milling and where Government subsidies and state orders were guaranteed, e.g. rolling-stock production.*

One of the most important factors in the economic growth of Budapest was the Danube, and at first, almost all the plants and factories were built on its banks. The railway construction, that became widespread during the last 30 years of the 19th century, also increased the regional concentration of manufacturing industry. Budapest soon became the commercial centre of the country, as the railway network spread in a radial fashion from the capital. Additionally the geographical proximity of the country coal field favoured the development of manufacturing industry, while the vigorous increase of the population offered an excellent consumer market.

The location of the leading organizations and institutions of economic life in Budapest proved to be another attraction for industry, and after the Compromise of 1867, a considerable inflow of foreign capital imported a new impulse to the manufacturing industry of the country. Economic development actuated the money-market, the number of credit operations grew, and Budapest became the seat of several monopoly organizations and share companies.

One of the most effective factors of location was government economic policy. In contrast to the provincial towns, Budapest enjoyed tax advantages and preferential transport rates for her products. In addition, the particular politico-economic conditions afflicting the rural areas, i.e. their agricultural character and underdevelopment, and the late development of capitalism, checked the establishment of any significant industrial centres other than Budapest.

The proximity of Vienna and Pozsony (Bratislava) also had a beneficial influence on the development of the Hungarian capital. Earlier relations were intensified along the Danube as a natural and cheap line of communication. Processed and unprocessed agricultural products were exported by the food plants of Budapest, up the Danube to Vienna.

The last decade of the 19th century was a period of rapid progress in Budapest, when more new industrial plants were established than in the

* Source: A Székesfőváros múltja és jelene számokban (Budapest, past and present in figures), Budapest 1932, p. 117.

previous 80 years. These ranged from metal plants, furniture factories, printing works and food-industry enterprises to three electricity power stations and several large brick yards. In the first decade of the 20th century a further 222 new industrial plants were established.

The rapid development up to the beginning of the First World War was assisted by the steady rise in the number of the inhabitants, by effective building schemes, and by a powerful upswing in the political, scientific and cultural life in the capital. At the same time, industry had become a particular factor with regard to the areal growth of Budapest and the rise in the number of its inhabitants. Thus the population of Budapest, using the present administrative area as the basis for comparison, rose from 297,000 in 1869 to 1,098,000 by 1910, with some 200,000 living in the suburbs.*

The rapid development of Budapest is also confirmed by the increase in its share of the total population of the country from only 1·8 per cent in 1869 to 3·8 per cent by the turn of the century, at which time it ranked seventh amongst the great European cities preceded only by the great capitals of London, Paris, Berlin, Vienna, St. Petersbourg and Moscow and Glasgow.

Thus, for example, 47 per cent of the industrial workers of the city were metal workers in 1900 (machinery steel and metal production), while 20 per cent had been employed in the food industry. These remained the leading branches until the First World War, although between 1900 and 1913 the rate of development was higher in the furniture, leather, footware and pharmaceutical industries, than in the machine and food sectors. At this time a number of important textile and chemical plants were also established, the former to a large extentred ressing backwardness of the textile sector.

The manufacture of machines for wood- and metal-working, for sugar refinery, and for the distilling and textile industries was begun on a small scale in the last decade of the 19th century. The number of machines produced was small, however, as is clearly seen from the fact that in 1912 only 30 per cent of the relatively low national demand was met on the home market. Machine-tool manufacture was minuscule. As regards equipment for the paper, leather and sugar trades barely 2 per cent of the demand was covered by domestic manufacture. Equipment for flour-milling constituted the only exception, comprising 40 per cent of machine output in 1898 and still 30 per cent of the total ten years later.

The general technical standard of industrial machines was low. Those produced in the electrical sector being the one exception. The leading plant for the production of electrical machinery was "Ganz". In the late 1890s, the predecessor of the present "Egyesült Izzó" (United Incandescent, also known as "Tungsram") was founded and started with the manufacture of cables and electric bulbs. About four fifths of all electrotechnical products were exported, mainly to Austria, Germany and Russia.

In Budapest in 1900 those gainfully employed in manufacturing industry numbered 64,000, i.e. 27·7 per cent of the total thus engaged in the country.

* Source: Statisztikai Évkönyv (Statistical Yearbook), Budapest 1913, p. 65.

In the capital only 25 plants employed over 500 workers, and 10 more than 1000* (Table I).

By the turn of the century Budapest had developed into an important industrial centre, though the proportion of small-scale plants and handicraft workshops was still considerable. Thus in 1900 the number of industrial workers was approximately 178 per 1000 inhabitants of Budapest, just over 55 per cent of whom where employed in factories, the remainder in workshops.

TABLE I

The participation of industrial branches in the employment structure, 1890–1910*

Branches of industry	1890		1900		1910	
	in thousands	per cent	in thousands	per cent	in thousands	per cent
1. Steel and metal production	2	5·7	5	7·8	12	10·8
2. Machines	13	37·2	25	39·2	36	32·6
3. Building materials	2	5·7	2·5	3·9	8	7·2
4. Wood processing	1	2·8	2	3·1	6	5·4
5. Leather and leather products	0·3	0·8	0·7	1·1	1·6	1·5
6. Textiles	1·5	4·2	2	3·1	4	3·6
7. Clothing	2	5·7	2	3·1	9	8·1
8. Paper	0·2	0·6	1·6	2·5	2	1·8
9. Food	8	22·9	13	20·4	17	15·5
10. Chemicals	2	5·7	4	6·3	6	5·4
11. Printing	3	8·7	6	9·5	9	8·1
Total	35·0	100·0	63·8	100·0	110·6	100·0

* The data do not include those engaged in mining, in the electricity generating industry, handicrafts and homecrafts, and miscellaneous industries

It can be seen from the above table that the number of industrial workers in Budapest grew threefold in 20 years and that in 1910 the machine sector alone employed more than the whole manufacturing industry in Budapest in 1890.

After the turn of the century, large-scale concentration was one of the characteristic features of industrial production in Budapest. Between 1890 and 1910 the number of plants employing more than 1000 workers had increased threefold (and the number of workers employed in these grew from 6·5 thousand to 25·3 thousand). On the other hand, it should be emphasized that industrial plants employing less than 50 workers still existed in large numbers.

* Source: Budapest félévszázados fejlődése, 1873–1923 (50 years of development of Budapest), Budapest 1923, p. 99.

The percentual proportion of Budapest processing industry in national total, 1910

	Budapest	Outside Budapest
Industrial plant	22·7	77·3
Capacity of motors and power machines in HP	25·4	74·6
Total workers	27·7	72·3
Total inhabitants	5·1	94·9

One of the chief characteristics of manufacturing industry in Hungary before the First World War proved to be a very high degree of territorial concentration. While 5 per cent of the country's population lived in the capital city and in its industrial suburbs, 23 per cent of all factories, 28 per cent of all factory workers, and 25 per cent of the total energy used in the manufacturing industry were concentrated in Budapest. In the early 20th century the industrialization of the outskirts of Budapest was begun and soon a peripheral industrial zone developed. As a result, the territorial concentration of the industry continued to grow. Besides Budapest it was only on the fringe of the country that a few small scale industrial centres were created.

The following table demonstrates that large-scale production in the modern sense was even more highly concentrated in Budapest.*

The proportion of Budapest processing industry in national total, 1910

Size of the plant (according to number of workers)	Per cent
21 to 100	22·3
101 to 500	27·2
501 to 2000	28·6
2001 to 3000	28·6
above 3000	33·3

As can be seen, nearly 30 per cent of all plants of medium size, and one-third of the total number of large-scale enterprises were concentrated in Budapest. At the same time only about one-fifth of the plants employing less than 100 workers were so located.

It is characteristic that this rapid growth was followed by a similar process in the suburbs and villages of the suburban fringe. The reason for this may

* In 1890 four machine factories in Budapest employed more than 1000 workers. This number had risen to seven by 1900 and eight by 1910. Additionally, by 1900 two food processing plants and one chemical factory fell into this category as did one textile factory and brickworks by 1910.

be attributed to the fact that it was only after adequate communications had become available that the suburbs could share the advantages created by the capital's favourable geographical and economic position. Thus the last quarter of the 19th century saw the beginnings of development on the urban fringe, characterized by the large-scale settlement of workers engaged in factories in Budapest. Industry in this belt was relatively slow to develop, and in the 1890's not more than 2000 workers were employed in suburban plants; of these, the number of workers exceeded one hundred in five plants only. By the first decade of the century, however, the outskirts of Budapest had developed into an area of considerable industrial attraction. Thus against an average of 11,000 workers in 1900, by 1910 more than 41,000 were employed in the factories located in the major suburban settlements of Újpest, Rákospalota, Kispest, Pesterzsébet, Soroksár, Pestlőrinc, Budafok and Csepel.

Owing to the change-over to war production of the existing industrial plant during World War I, the number of workers employed in the suburban factories was 50 per cent higher in 1920 than in 1910, while the number of industrial workers in Budapest proper declined considerably. According to statistical data, factory workers in Budapest and in the suburbs combined numbered 68,502 in 1900, 123,693 in 1910 and 88,952 in 1920. For the suburbs only the respective figures were 3888, 17,166 and 25,174.

Those industrial districts that at present contain the bulk of industrial labourers in Budapest came into being during the first twenty years of this century. Accordingly, tanneries, and joineries were established in Újpest, mills and machine factories in Angyalföld, mills and slaughters in Ferencváros, railway works, textile factories, the building materials industry and breweries were located in Kőbánya, and the "Weiss Manfred" machine-works on Csepel island developed in the course of 20 years into the largest plant in Budapest. Óbuda distinguished itself by its shipbuilding, textile factories and brickworks, while South-Buda developed its textile and food industries.

Summarizing the period from the Compromise of 1867 to the outbreak of the First World War, it can be stated that the industrial development of Budapest was influenced primarily by the following factors:

(1) The existence of the vast territory that comprised "historical" Hungary. The market for the products of Budapest industry was artificially widened owing to a discriminating policy that manifested itself in respect of certain nationalities.

(2) The building of a centralized road and railway network increased the advantages derived from the natural geographical position of Budapest. The expansion of economic relations both with other regions of the country and with foreign countries was an important condition for the evolution of Budapest into the "import and export gateway" of the country's industry.

(3) A large-scale building policy at the close of the century converted Budapest into an impressive capital for the Hungarian part of the Monarchy.

(4) The rapid increase in population transformed Budapest into the largest consumers' centre within the country, and ensured a permanent source of labour for its growing industry.

(5) Regarding spatial distribution, manufacturing industry was initially established on the periphery of the city-core of Budapest. From the turn of the century, however, the role and weight of manufacturing industry in the suburbs and communities on the urban fringe, which administratively were only incorporated within Budapest in 1950, increased from year to year.

2. THE INTERWAR PERIOD

With the object of extending its domination and controlling new markets, Hungary in alliance with Austria plunged into war. The war-economy emphasized the output of armaments particularly from the machine plants in Budapest reducing at the same time the manufacture of production tools and consumer goods. Another deleterious consequence was that the raw material and labour reserves of the country were almost completely exhausted.

With the disintegration of the Dual Monarchy, Hungary legally became an independent state. Budapest found itself the capital of a smaller country (92,000 square kilometres) but one virtually homogeneous ethnically.

The redrawing of the map of East-Central Europe altered the conditions for industrial growth. Now as an independent state Hungary no longer faced competition from the more developed Austrian and Czech manufacturing industry. Now Hungary was able to pursue an independent economic policy and to develop those branches of industry which it was impossible to do under the Austro-Hungarian Monarchy.

A rapid upswing was registered first of all in certain branches of light industry such as clothing, wood-working and paper, while flour milling and sugar refining, traditional sectors of the food industry, contracted. The "underdeveloped" machine-building industry also presented problems. It has become extremely unbalanced because such branches as vehicle-building and farm-machine construction had become dominant, at the expense of, for example, the manufacture of machine tools. Imports in this sector thus continued at a high level.

One of the anomalous consequences of the territorial changes was that post-war Hungary was more industrialized than its predecessor because the majority of development of the factories had occurred in the central areas of the country, especially in Budapest. The former economic relations governing industrial production, trade and economic cooperation in Hungary abruptly changed. A shortage of raw materials, consequent upon the old producing districts being outside the new frontiers of the country, had created a serious situation, in which it proved impossible to exploit properly the considerable part of the processing industries of the country located in Budapest. The growth of the manufacturing industry in the capital as a consequence slowed down. Progress was also hampered by disorganization and the change-over to peaceful production. From the middle of the 1920's economic activity accelerated but this did not extend to all branches. As a result production in 1929 was just over ten per cent higher than in 1913. Owing to independent tariff barriers, some branches no longer suffered from Austrian competition and slow but steady progress became apparent in the textile, glass,

shoe, paper and chemical industries, as well as in the manufacture of electrical machines.

Within a short period the textile industry came to occupy a position in Budapest, very similar to that of flour milling previous to the First World War. A fundamental difference was to be observed, however, in that the food industry had processed home produce mainly for export, while the textile industry utilized imported raw materials and satisfied home demand. Another essential difference was that the food industry had utilized equipment produced internally whereas the textile industry in the twenties acquired its looms and spinning mills from Austria and Czechoslovakia, where light industry in like fashion to the export sectors of the Hungarian food industry had lost their formerly extensive markets, owing to the disintegration of the Habsburg Empire, and struggled with marketing difficulties. As a result, the relatively vigorous light industry of the period had to content, in the majority of cases, with technically obsolete equipment imported from these two countries.

The world economic crisis of 1929 had a dramatic impact on Hungary. Total production overall fell by one quarter, while in some of the sectors of heavy industry output was reduced by one half. In 1935 the volume of production was still lower than in 1929, and it was only in the second half of the 1930's that some improvement was to be seen, owing mainly to war preparations.

As a consequence of the reduction of the country's territory to one quarter of its former extent, the weight and significance of Budapest in industry had greatly increased. Since further industrial expansion was restricted to Budapest, the industrial backwardness of the provinces remained unchanged, and the antagonism and competition between Budapest and the countryside became keener on account of the diminished internal markets. Naturally the stronger and technically better equipped Budapest was the winner of the contest.

A high degree of concentration was the characteristic feature of Hungarian industry between the two wars. Prior to the First World War, within the frontiers of historical Hungary only about one-quarter of the industrial workers of the country had worked in the industrial plants of Budapest. In 1920, by comparison, 65·3 per cent of those gainfully occupied in manufacturing industry were to be found in Greater Budapest, i.e. within the present administrative boundaries of the capital, even though the change over from war manufacture to peaceful production had affected the industrial establishments of Budapest more than those of the provinces.

Changes also occurred in the proportions of industrial workers between Budapest and the suburbs, because of the post-First World War development the labour-intensive light manufacturing industry in the urban fringe. The industrial growth of Greater Budapest was mainly ensured by this process, the consolidation of which was one of the most characteristic features of the interwar period. The above is clearly demonstrated by the following data:

From 1920 to 1930 the areal concentration of industrial workers increased slightly. The share of Budapest and its suburbs was not only high in relation to workers in manufacturing industry which rose from 65·3 per cent in 1920

to 66·6 per cent in 1930 but also as regards the proportion of all workers.* Concentration was most conspicuous in the sphere of machine production, although this sector as a whole exhibited a tardy rate of growth between the two wars. Only the Ganz, Egyesült Izzó and Láng companies exported in considerable quantities, mainly due to a high technological standard. Thus "Ganz" constructed excellent turbo-generators, transformers and up-to-date electrical engines, while "Egyesült Izzó" held the lead in telecommunication engineering and vacuum equipment and appliances.

The chronic stagnation of Hungarian agriculture forced the agricultural machine industry of Budapest either to completely discontinue its manufacture or to utilize only partially their existing capacity, producing for the export market.

In view of the limited capacity of the internal market other machine factories in Budapest tried either to export their products, or to change frequently their production programme. Thus "Mávag" and "Weiss Manfred" experimented with the production of small quantities of tractors, treshing machines, lorries, motor-buses, machine-tools and even with passenger cars in small quantities.

The electrical machine industry has since remained the leading export branch, being competitive with foreign firms, and possessing its own patents, skilled and trained workers and qualified and experienced technical staff. About two-thirds of the engineering industry exports of Budapest were made up of electrical commodities, principally the products, such as electric light bulbs of "Egyesült Izzó". This company exported on average three-quarters of its products and also started the manufacture and export of radios.

The engineering industry of Budapest in general exported a considerable part of its products,** which besides electrical products, comprised rolling-stock, agricultural machinery and electric locomotives. It was thus rather anomalous that at the same time there were many products for which the industry had difficulty to meet even the modest home demand. Many branches of the machine industry did not exist at all or remained in the initial stages of development. Machine-tools, instruments and motor-car production were backward, while ball bearings and mining equipment were not produced at all.

To meet the requirements of the various industrial sectors in the country, machinery and production equipment therefore had to be imported. The most frequent import items were machinery for light industry from Austria, Germany and Great Britain, machine-tools from Germany and instruments from Switzerland. In these fields Hungarian firms could not compete with their West-European counterparts, because of an inadequate home market.

From the point of view of industry as a whole, leaving aside the post-war development of textiles little headway was made. Workshops employing less than 20 workers continued to exist in abundance in Budapest and according

* Lackó M.: Adatok a főváros munkásosztályának összetételéről a XX. század 20-as éveiben (Data concerning the composition of the working class of Budapest in the twenties of this century), Budapest 1958.

** On the average one-fifth of the machinery produced in Budapest was exported in the thirties, although figures as high as 60 or even 80 per cent were not rare.

to the 1930 census employed 74,000 persons or 32 per cent of all industrial workers in the capital, an increase of 12,000 over the figure for 1920. No significant technological improvement or rise in labour productivity could be realized under such working conditions. The handicraft industry also remained a characteristic feature of Budapest, as well as the rest of the country.

Compared with the situation prior to the First World War, the character of production underwent a number of changes. Before the war each factory had endeavoured to manufacture a variety of products. After 1918, on the other hand, variety was reduced as a consequence of the smaller internal market. At the same time the existing capacity and productive skill of the workers provided possibilities for increased specialization, while, as a result of the greater dependence upon foreign markets, production schedules were modified in a number of industrial plants. The processing of agricultural products remained prominent. It should be emphasized that the contribution of the food industry in Budapest to total productive value in 1938 was still somewhat higher than that of all light industry combined, even though it employed less than 12 per cent of the total number of industrial workers in the capital.

The low level of industrial output and the narrowly based domestic market did not permit the growth of industrial centres outside Budapest. Therefore, the major part of the manufacturing industry continued to be concentrated in the capital which offered favourable geographical, economic and cultural conditions for further industrial growth. Thus in spite of growth during the interwar period the degree of concentration in manufacturing remained very high, and in 1938 there were in Budapest 1553 plants and factories employing 126 thousand workers.

The share of Budapest in the national industrial production* (in per cent)

Year	Value of production	Number of workers	Number of plants
1929	44·2	43·5	33·3
1933	43·3	46·1	35·6
1938	44·0	43·8	38·9

* The above data do not refer to the 6 towns and 18 communities annexed to the capital in 1950.

The degree of concentration was even higher than shown by the above figures because they do not include the industrial zone around Budapest, where 306 plants were in operation, employing about 60 thousand workers, i.e. nearly one fifth of total factory workers in the country as a whole. In other words, *Greater Budapest* contained about 47 per cent of all factories and 62 per cent of total factory workers. Outside the capital and its urban fringe a few industrial foci of secondary importance existed in general close to the occurrence of natural resources.

The share of Budapest in the various branches was naturally different; in the clothing and printing trades, for instance the location of additional plants in the urban fringe, altered the situation very little owing to their preponderance in the central districts of the capital. The situation was different, however, in the case of the machine and textile industries. Important new textile works attracted by the availability of labour, were established in Újpest and Kispest, and machine factories in Csepel, Újpest, Budafok and Kispest, and as a consequence the proportion of these two branches to be found in Greater Budapest was considerably higher than the value indicated in Table II. Similar comments may be made about the wood processing, paper and leather industries.

TABLE II

The participation of Budapest in the national manufacturing industry, 1938

Industrial branch	Production value (in millions of pengő)	Share of the capital's plants (per cent)	Exports (per cent)
(A) *Heavy industry*			
1. Steel and metal	118	27·4	4·4
2. Machines	195	62·1	20·9
3. Electricity generation	53	38·7	—
4. Building materials	23	20·5	3·3
5. Chemical industry	141	48·3	5·5
Total	530	45·2	—
(B) *Light industry*			
1. Textile	184	39·4	7·7
2. Clothing	58	73·4	16·6
3. Leather and leather products	33	28·1	20·6
4. Wood processing	28	35·3	1·2
5. Paper	26	46·8	1·1
6. Printing	46	90·6	1·6
Total	375	44·1	—
(C) *Food industry*	377	40·8	14·1
Grand total (A + B + C)	1282	44·0	10·5

On the basis of the proportion of total industry located there, the industrial branches of Budapest may be divided into three groups, namely (*a*) industrial sectors located predominantly in Budapest more than 60 per cent of total plant, (*b*) those industrial sectors where between 38 and 46 per cent of total plant was located in Budapest and (*c*) industrial sectors comparatively poorly represented in the capital—less than 35 per cent of total plant.

The printing, clothing and engineering industries belong to group (*a*). A high degree of concentration in large cities is characteristic of the first

two sectors, while that of the engineering industry was due mainly to historical, economic and geographical factors.

The printing and clothing industries of Budapest each employing 7000 workers differed mainly in the sale of their products in that the former produced almost exclusively for the home market, while the latter figured more prominently in exports. On the other hand, the machine industry absorbed between 27 and 28 per cent of the total labour force of the capital.

The chemical, paper, food and textile industries belonged to group (*b*) although the last would fall into category (*a*) if the textile mills of the suburbs were to be added.

Transportation played different roles in the development of these industries. In the textile, chemical and paper industries the delivery of foreign raw materials was most favourable in Budapest; the same applied to exports made by the food industry and the purchase of home-produced raw materials. For the paper mills direct connection with printing firms in the capital concerning production and supply matters was of primary importance. It should also be emphasized that from a technological point of view the industries in the second group subsist on a plentiful supply of industrial water and a location beside the Danube proved a natural advantage.

The paramount significance of the food industry is shown by the fact that in 1939 38 per cent of total production exported from Budapest was derived from this sector.

The iron and steel, building materials, leather and shoe and the wood-processing sectors belonged to group (*c*). The relatively low concentration of these sectors in Budapest may be explained by the need for the first two to be close to raw materials and fuel supply. They preferred locations in the suburbs especially in Újpest. It is also worth remembering that the leather and shoe trade produced largely for exports, the bulk of which, and this applies to wood processing as well, were exquisite items produced by individual craftsmen.

From 1938 onwards, the intensification of war preparations meant the rise to prominence of the armaments industry and related branches. The effect was felt mainly by the engineering industry which in Budapest doubled in manpower between 1937 and 1939 and increased threefold between 1937 and 1943. "Weiss Manfred" Works was the first to be affected by war preparations, and as early as 1938 30 per cent of its products comprised military equipment—army lorries and later military air-craft.

It has been pointed out that at the beginning of the 20th century poorly developed light industry, especially textiles, and a predominance of food processing characterized manufacturing in Hungary. Although during the inter-war period the comparatively rapid expansion of textiles, paper and wood-working produced a significant change in the structure of manufacturing, this was still insufficient to displace the food industry as the leading sector on the eve of the outbreak of the Second World War. The part played by heavy industry was comparatively small, the machine-tools industry being on an extremely low level.

The agricultural character and economic backwardness of the country were also reflected in the structure of industry in Budapest. Food processing

continued to be a prominent branch. It should be emphasized that the share of the food industry of Budapest in the production value of 1938 was still somewhat higher than the combined ratio of all light industrial branches of the capital, while less than 12 to 13 per cent of the total number of industrial workers of Budapest had been employed in the food industry.

In summary, the period between 1890 and the outbreak of the First World War was one of large-scale industrialization. As a result, at the beginning of the 20th century about one quarter of the industrial output of the Austro-Hungarian Monarchy was derived from "historical" Hungary, i.e. 1·5 per cent of Europe's total industrial production. Industrial development was supported by the economic policy of successive Hungarian governments, which manifested itself in governmental subsidies and also in tax, tariff, and customs policy. However, despite rapid growth the structure of Hungary's manufacturing remained underdeveloped being mainly concerned with the food industry. Machine-building by comparison developed at a slower rate than any other industrial sector.

3. AFTER THE SECOND WORLD WAR

As a result of the German occupation, and the dismantling and removal of factory equipment by force, manufacturing industry in Budapest suffered more seriously than that of the country as a whole. 16 per cent of total industrial plant in Budapest was destroyed, compared with a national average of 12 per cent. In spite of all efforts, industrial production reached but 30 per cent of that in the year immediately before the outbreak of war.

After 1945 the main task was the reconstruction of war-time damage, and the restoration of the productive capacity of manufacturing industry. For this reason the disparities between the level of development in Budapest and the provinces, which had been intensified by the war, could not be lessened. Thus in 1949 the capital still employed 51·4 per cent of all industrial workers in the country.

Both the nationalization of factories between 1946 and 1948, and the elaboration and realization of the Three Year Plan (1947–1950) played an important role in the rapid and efficient reorganization of industrial production. Nationalization permitted of the closure of small uneconomic factories, increased specialization in production and the rationalization of small- and medium-sized plant.

The first Five-Year Plan, 1950–1954, aimed to change the regional proportions of productive forces. For this purpose, some four-fifths of all industrial investment was directed towards the provinces, and 59 out of 75 newly established plants were located there. As a consequence the proportion in manufacturing industry in Budapest decreased from 51·4 per cent in 1949 to 44·1 per cent in 1955. Despite this the absolute number of industrial labourers in Budapest increased at an annual rate of some 20 thousand.

The changes in economic policy in 1953 and the counter-revolution of 1956 temporarily increased the capital's proportion again but from the beginning of 1958 a slow but permanent decrease in the percentage of manufacturing

industry in Budapest became apparent. Parallel to this, the industrialization of the backward provinces was emphasized.

A concerted policy for the industrialization in the provinces was scheduled in the second Five Year Plan in order to achieve higher efficiency. The Plan proposed the transformation of the five provincial cities of Miskolc, Debrecen, Szeged, Pécs and Győr into modern industrial centres in order to provide thus competitive counterpoles to Budapest. Instead of establishing new

TABLE III

The growth of manufacturing employment in Budapest between 1890 and 1969*

Industrial branch	1890		1900		1910	
	in thousands	per cent	in thousands	per cent	in thousands	per cent
I. Primary metal industries	2·0	5·7	5	7·9	12	10·9
II. Machines	13	37·1	25	39·2	36	32·5
III. Textiles	1·5	4·3	2	3·1	4	3·6
IV. Food	8	22·9	13	20·4	17	15·5
V. Chemicals	2	5·7	4	6·3	6	5·4
VI. Building materials	2	5·7	2·5	3·9	8	7·2
VII. Wood processing	1	2·9	2	3·1	6	5·4
VIII. Leather and leather products	0·3	0·8	0·7	1·1	1·6	1·5
IX. Clothing	2	5·7	2	3·1	9	8·1
X. Paper	0·2	0·6	1·6	2·5	2	1·8
XI. Printing	3	8·6	6	9·4	9	8·1
Total	35·0	100	63·8	100	110·6	100

Industrial branch	1939		1943		1946	
	in thousands	per cent	in thousands	per cent	in thousands	per cent
I. Primary metal industries	20	14·1	18	11·5	11·0	11·1
II. Machines	39	27·5	61	38·9	34	34·3
III. Textiles	25	17·6	20	12·7	14	14·1
IV. Food	17	12·0	17	10·8	10	10·1
V. Chemicals	9	6·4	10	6·4	9	9·1
VI. Building materials	5	3·5	5	3·2	3	3·0
VII. Wood processing	5	3·5	7	3·2	2	2·0
VIII. Leather and leather products	4	2·8	1	0·6	0·2	0·2
IX. Clothing	7	4·9	6	3·8	2	2·0
X. Paper	4	2·8	5	3·2	1	1·0
XI. Printing	7	4·9	9	5·7	5	5·0
Total	142	100	157	100	91·2**	91·9**

* The data do not include those engaged in mining, in the electricity generating industry, handicrafts and homecrafts, and miscellaneous industries.

** There were 8 thousand workers (8·1 per cent) engaged in miscellaneous industries.

factories in Budapest, the modernization of already existing plant and the renewal of capital equipment was the aim. Yet, despite the continued diminution of her relative importance, the number of industrial workers in Budapest still increased by 40 thousand between 1960 and 1965.

In 1969 industry employed 643 thousand persons in Budapest,* i.e. 35 per cent of the total number of workers engaged in manufacturing industry in Hungary. Due to the structure of the capital's industry, however, the propor-

1921		1929		1932		1933		1937	
in thousands	per cent	in thousands	per cent	in thousands	per cent	in thousands	per cent	in thousands	per cent
7	11·7	13	12·7	8	11·0	9	11·4	15	13·5
20	33·3	22	21·6	12	16·4	12	15·2	21	19·2
3	5·0	16	15·7	14	19·2	18	22·8	26	23·6
10	16·7	14	13·7	13	17·8	13	16·4	14	12·7
4	6·7	6	5·9	5	6·9	6	7·6	7	6·4
3	5·0	8	7·8	4	5·5	4	5·1	5	4·6
3	5·0	6	5·9	3	4·1	3	3·8	4	3·5
2	3·3	2	2·0	2	2·7	2	2·5	3	2·7
2	3·3	5	4·9	4	5·5	4	5·1	6	5·6
1	1·7	3	2·9	2	2·7	2	2·5	3	2·7
5	8·3	7	6·9	6	8·2	6	7·6	6	5·6
60	100	102	100	73	100	79	100	110	100

1952		1955		1958		1965		1969	
in thousands	per cent	in thousands	per cent	in thousands	per cent	in thousands	per cent	in thousands	per cent
18	5·8	18	5·4	17	4·7	21	5·2	27	5·3
143	46·3	147	43·5	151	42·7	185	46·0	256	49·5
47	15·2	49	14·8	53	14·9	56	13·9	65	12·2
18	5·8	23	6·8	24	6·7	24	6·0	39	7·5
17	5·5	20	5·9	24	6·7	35	8·7	42	8·2
14	4·5	14	4·1	15	4·2	14	3·5	17	3·3
12	3·9	15	4·4	16	4·5	16	4·0	13	2·6
3	1·0	4	1·2	5	1·4	34	8·5	37	7·3
26	8·4	35	10·3	38	10·6				
4	1·3	4	1·2	5	1·4	7	1·7	8	1·5
7	2·3	8	2·4	8	2·2	10	2·5	13	2·6
309	100	337	100	356	100	402	100	517	100

* Of these 547 thousand are engaged in state industry, 75 thousand in cooperatives and 21 thousand in the private sector.

tion in terms of productive value amounts to 43–45 per cent. Yet, these average figures hide the wide variations that occur between the various sectors of industry. Thus 70–80 per cent of telecommunication and vacuum equipment is manufactured in Budapest as is more than 50 per cent of the other branches of machine production, paper-making and printing industry. The food industry only 25 per cent of which is concentrated in the capital exhibits the lowest proportion.

Between 1949 and 1969 the number of industrial workers in Budapest increased from 297 to 643 thousand. This considerable increase derived from the growing participation of women in industrial production, the large inflow of population from rural area and the increase in commuting.

The large-scale employment of women is clearly indicated by the reduction in the number of women engaged purely as housewomen from 296,000 in 1949 to 280,000 in 1968. The corollary of this has been the rise in the proportion of women working in industry from 37·2 per cent in 1938 to 46·2 per cent in 1968.

The proportion of commuters increased at the same time. In 1968 one-fifth of the industrial workers in Budapest—about 130 thousand persons—commuted to work. Instead of decreasing the number of commuters, it is stated policy to reduce journey times by establishing an up-to-date suburban communication network.

The overconcentration of manufacturing industry in Budapest, on the one hand, restricts the industrialization of the backward areas of the country, and on the other by producing overcrowding, creates problems in the capital. Another further difficulty arises from the scattered location of industry in Budapest, the gradual concentration of which may accelerate improvements in industrial efficiency (Table III).

4. A COMPARATIVE APPRAISAL

In most European countries, even in those where the capital plays an outstanding role in the economic life of the country, for example in Austria, a number of other towns act as political, cultural and industrial centres in addition to the capital. Yet a characteristic feature of the economic geography of Hungary is that it has essentially only one great city of European proportions. This point is clearly demonstrated by the fact that the total population of all other Hungarian towns combined is approximately equal to that of Budapest.

The situation in Hungary is compared with that in other European countries in Table IV, where the population of the capital cities plus the second, third, fourth and fifth ranking settlements are given.

In compiling Table IV (see below), the following towns are taken into consideration (in brackets: date of census and number of population in thousands).

Hungary (1960, 1970): Miskolc (144; 173), Debrecen (129; 155), Pécs (115; 146), Szeged (99; 119); *Austria* (1961, 1968): Graz (237; 253), Linz (196; 206), Salzburg (107; 120), Innsbruck (101; 114); *Romania* (1960, 1968): Cluj (162; 191), Timişoara (147; 182), Braşov

(129; 172), Constantsa (130; —), Iaşi (—; 170); *Bulgaria* (1959; 1965), Plovdiv (131; 223), Varna (124; 180), Ruse (92; 129), Burgas (76; 106); *Yugoslavia* (1961, 1964): Zagreb (427; 491), Skopje (162; 212), Sarajevo (152; 218), Ljubljana (133; 178); *GDR* (1960, 1969): Leipzig (590; 586), Dresden (494; 501), Karl-Marx-Stadt (286; 299), Halle (278; 260); *Poland* (1960, 1969): Łodz (708; 753), Cracow (479; 577), Wroclaw (429; 517), Poznan (408; 462).

As can be seen from Table IV, the significance and role of Budapest in Hungary can only be compared with the position of Vienna in Austria. The important role they play in the administration of their countries and the large proportion of the total population of their respective countries that they command is a consequence of the long and complicated historical evolution of the Austro-Hungarian Monarchy.

In terms of population number, Budapest is the third largest city of socialist Europe after Moscow and Leningrad discounting divided Berlin. Budapest is at the same time the political, administrative, economic and cultural centre of the country, as well as the most important transport node. Naturally each of these functions has its own historical root, and logic for development which is independent of industry. Notwithstanding this, however, the dominant reason for the leading role of Budapest is its industry.

Thus from the 1970 statistical survey it can be established that 34 per cent of the industrial workers of Hungary were employed in the plants and factories in Budapest, which in turn produced 38·8 per cent of total output in terms of value.

Before entering into a general, economic–geographical discussion of the industry of Budapest, let us compare her industry with that in the capitals of the surrounding countries and with that of the other significant industrial centres in Hungary.

Owing to a rapid and continuous growth during the last decade, one-fifth of the country's population is living now in Budapest, a figure exceeded only by Copenhagen (29 per cent)* and Vienna (23 per cent), while more than two-fifths of the industrial workers of the country are employed in her manufacturing industry (Table V).

The comparison of capitals is of a tentative nature. Data can be confronted only with a hypothetical validity as manufacturing industry is described in the majority of cases in an entirely different sense and the administrative boundaries of various capitals do not represent simultaneously the economic boundaries. Thus the economic weight of, for example, Vienna and Prague would be more considerable if the economically linked but otherwise independent suburbs could be included.

It appears from Table V that in terms of the capital city's industry Hungary does not conform with any of the other European socialist countries. Bucharest and Sofia, for instance, employ but one-fifth of the total workers in the manufacturing industry of their respective countries, although playing no less an outstanding role in the industrial production of their countries. In Yugoslavia, however, Zagreb employs somewhat more industrial workers

* "Greater Copenhagen" according to the Danish Statistical Office. In the city a smaller quota of the population in the administrative sense, is concentrated.

TABLE IV

Index of metropolitan dominancy

	Number of inhabitants				How many times (a) is larger than (b)		Share of the capitals in the population of the country	
	(a) capital		(b) 4 biggest cities					
	(in thousands)							
	1960	1969	1960	1969	1960	1969	1960	1969
Hungary	1844	1940[1]	487	593	3·78	3·27	18·4	18·8
Austria	1627	1641[2]	641	693	2·54	2·37	23·0	22·3
Romania	1349	1415[2]	568	715	2·38	1·98	7·3	10·0
Bulgaria	671	801[3]	423	638	1·59	1·26	8·5	9·5
Czechoslovakia	1000	1035[4]	960	1023	1·04	1·01	7·3	7·2
Yugoslavia	588	678[5]	864	1099	0·68	0·62	3·2	3·3
German Democratic Republic	1072	1084	1648	1646	0·65	0·66	6·2	6·3
Poland	1136	1289	2024	2309	0·56	0·56	3·8	3·9

[1] 1970. I. 1.
[2] 1968
[3] 1965
[4] 1966
[5] 1964

TABLE V

Statistical data for the capitals of Middle-East Europe, 1969

	Number of inhabitants (in thousands)	Area (sq.km)	Population density (per sq.km)	Share of capitals in the manufacturing industry, 1961
Budapest	1940	525	3688	43·3
Vienna	1641	414	3963	30·0
Sofia	801	950	843	18·8
Bucharest	1415	970	1458	18·3
Prague	1035	185	5594	9·6
Belgrade	678	629	1078	6·7
East Berlin	1084	403	2689	6·0
Warsaw	1289	427	3018	5·8

than Belgrade. Only Vienna can compare with the economic situation of the Hungarian capital.

Similar conclusions can be drawn when individual sectors within manufacturing industry are examined (Table VI).

The proportions of *all* industrial sectors located in Budapest is higher than those of the capital cities of neighbouring countries. The only exceptions are ready-made clothes in Vienna,* and printing in Sofia.

* With regard to ready-made clothes it should be noted that this difference is more or less compensated for by cooperatives and craftsmen of the same industry concentrated in Budapest.

TABLE VI

European capitals' shares in the industrial production of their countries, 1961

Branch	Budapest		East Berlin		Bucharest		Sofia		Warsaw		Prague		Vienna*	
	I	II	I	II	I	II	I	II	I	II	I	II	I	II
1. Iron, steel and metal production	28·6	36·9	1·8	4·7	7·2	8·4	4·8	16·9	2·8	2·6	—	—	—	—
2. Machines and fabricated metal products	67·2	66·5	9·7	9·4	26·1	26·3	34·6	37·0	11·2	12·1	15	—	—	32·3
a) transportation equipment	58·3	56·2	5·9	3·7	—	—	—	—	8·2	8·9	—	—	—	—
b) electrical machinery	76·9	82·4	24·6	21·9	—	—	—	—	25·2	24·6	—	—	—	—
3. Electrical generation industry	24·6	17·1	10·6	6·8	14·0	—	11·8	22·2	0·3	8·1	11	—	—	—
4. Building materials	24·6	30·8	1·9	3·1	10·3	12·3	14·2	14·9	2·9	5·1	2	—	—	11·9
5. Chemicals	57·9	50·7	4·0	4·6	33·5	32·1	43·0	35·5	7·8	8·3	13	—	—	33·9
6. Lumber and wood products	44·9	65·7	3·9	5·0	5·2	—	8·8	10·8	2·7	2·6	10	—	—	19·2
7. Paper	75·8	74·7	3·1	2·9	10·7	—	50·9	42·5	3·2	1·7		—	—	15·3
8. Textiles	53·6	60·2	0·3	0·3	28·6	32·1	22·9	26·1	0·8	0·7	3	—	—	19·1
9. Clothing	43·4	49·6	1·7	10·9	30·5	32·7	26·4	26·5	8·9	8·6		—	—	55·0
10. Leather and leather products	63·6	65·5	2·9	3·2	26·0	27·1	40·3	36·2	4·8	4·9	—	—	—	29·4
11. Printing	76·1	83·9	18·4	26·4	56·9	64·2	82·6	86·1	29·3	36·1	50	—	—	56·7
12. Food	30·7	37·6	6·6	7·2	17·0	16·7	10·2	13·0	4·5	4·0	5	—	—	37·6
Total	43·3	46·8	6·0	6·6	18·3	20·3	18·8	21·3	5·8	5·8	9·6	9·7	30·0	31·8

I = on the basis of the number of persons employed
II = on the basis of gross production value
— = no data
* = the data of Vienna refer to 1953

It may be seen from Table VI that nearly 77 per cent of the electrical machine industry in Hungary is concentrated in Budapest, compared with a figure of less than 25 per cent for East Berlin in the GDR. Even so approximately the same number of workers are employed in this sector in both cities, but while every eighth worker in Budapest is an electrician, in East Berlin every third worker is employed in the electrical machine industry.

The share of Budapest is also relatively high in the wood processing branch (44·9 per cent) and in the building material industry (24·6 per cent), compared with the proportion of other capital cities which rarely exceed 10 per cent. The same applies to the textile industry, for while in Prague and Warsaw not more than 2000 and 3000 persons respectively are employed in the textile industry, in Budapest this number amounts to some 64,000 (1969).

II. PROBLEMS ARISING FROM INDUSTRIAL CONCENTRATION

1. CAUSES AND CONSEQUENCES

When examining the causes of the high concentration of industry in Budapest it should be remembered that they are primarily of a historical and socio-economic character, rather than reflecting the favourable geographic situation of the capital. It was only in the initial stages of economic development that natural geographical and socio-economic factors were of equal importance.

Among the geographical factors influencing the location of industry in Budapest that of the Danube was considerable, first as a suitable crossing place, and subsequently as a cheap transport route. Thus since the turn of the century the chemical, paper, leather and power-generation industries had made free use of the waterway. Another factor favouring the development of manufacturing industry was the proximity of the coal fields at Tatabánya and to a lesser extent at Nógrád.

The proximity of the Great Plain was also significant, in that its agricultural products satisfied the food requirements of the population of Budapest and produce for the food processing industry.

Among the historical factors the efforts of the Hungarian bourgeoisie, in taking advantage of their limited political and economic independence, to create a political, economic and cultural centre similar to Vienna in the Hungarian part of the Dual Monarchy must be recognized.

Examining the influence of socio-economic factors, it cannot be denied that Budapest was the most important labour market in the country, from the early development of manufacturing industry up to the end of the Second World War. The concentration of skilled workers in the capital became an important factor, firstly, at the close of the century when the pace of railway construction slowed down and later, after the First World War, when skilled labour was available to allow the rapid expansion of the telecommunications, electrical engineering and instrument construction sectors of the engineering industry. The rapid evolution of the textile industry between the two world wars is similarly connected with the manpower surplus in Budapest.

The existence of administrative and financial bodies—ministries, banking firms, the stock exchange, and foreign trading companies—likewise contributed to the concentration of the manufacturing industry in the capital. Additionally from 1870 manufacturing industry was attracted by the demand of the fast growing population of Budapest, which played an important part

in the establishment of food processing and other branches of light industry.

Finally the construction of a transport network focussing on Budapest has in many respects also been responsible for the disproportionate concentration of industry in the same.

2. FOREIGN EXAMPLES

The capital is usually the largest city, and economically and culturally the most developed. In the majority of cases the capital is the truest representative of a given country. As a rule, the capital city is the leading industrial centre as well, for instance London, Paris, Vienna, and Budapest, but in certain cases the reverse is true, for example Rome, Bern and Belgrade.

The rapid development of the European capitals—London and Paris excepted—began approximately a century ago; this is closely connected with the intensification of the national economies, first of all with the growth of the manufacturing industry both in Western and Central Europe. In Eastern Europe the economic and social evolution occurred later and this was also reflected in the growth of the capital cities. In this part of Europe political significance gave rise to the development and the activity. They are all large industrial centres, mainly of the engineering and electrical industries. Most of the capital cities also play an important role in communications.

Throughout the world there is a tendency for people to concentrate in large centres, especially in the capitals. In Western Europe this is most pronounced in Geat Britain and in France. In Eastern Europe the stage of population concentration is different. The index of concentration expresses the population of the capital city as a percentage to the total population. In Hungary it amounts to 18·8, but remains below 10 in the other countries Vienna and Bucharest excepted. The lowest indices are in Yugoslavia (3·3) and in Poland (3·9).

When speaking of the capital cities and their statistical data it should be borne in mind that the definition of municipal area varies between countries. This follows from the administrative inclusion of the suburban and even neighbouring regions into towns.

As a rule the concentration of manufacturing industry is much higher than that of the population. Thus in Ireland 40 of all workers in manufacturing are concentrated in the capital and the corresponding values for Hungary, Denmark and Austria are 38, 33 and 33 per cent, respectively. In certain cases, however, the opposite is true. Thus in Rome only 4–5 per cent, in Warsaw 7 per cent and in Belgrade only 6 per cent of the total number of workers in the manufacturing industry of the respective countries are concentrated.

At the present stage, however, the concentration of manufacturing industry creates not only a disproportionate territorial structure, but also creates troubles and difficulties in the city itself. With the increase in the number of population the built-up area becomes larger and larger. The first consequence is generally a rise in the price of building sites. As a rule in the large

industrial centres where the wages of workers of the building industry and their demands are much higher than in the provinces, the creation of new industrial sites becomes increasingly expensive. Yet the horizontal extension of large cities, mostly capital cities, is only a pseudo-solution, because the difficulties created by the overcrowded core-area are simply transferred to the urban fringe.

The first victim of the overconcentration of production in capital cities is manufacturing itself. The daily commuting to the city exhausts the commuters and lowers their productivity. For example, two thirds of the working people in the French capital spend on average 1 hour and 20 minutes going to and from their places of work. Investment into industry is usually higher than in the periphery, because the cost of land and the building of new factories is also higher as are the wages of the workers. Because of the close spacing of factory sites there is no possibility for a redistribution of factories within the boundary line along more modern rational lines.

The rapid concentration of production emphasizes the disharmony between the densely and scarcely populated areas which is also reflected in population age structure. The more populated areas usually have "younger" populations, the average age is lower, and the population is potentially more productive demographically. By contrast, the average age of the population in the less dense areas is higher.

The increase in productivity in both manufacturing industry and agriculture leads to depopulation in some areas, and to urbanization and agglomeration in others. As a result in some European countries the capital city may play an exaggerated role, in some there is no potential "second" city to counterbalance the exceptional share of the capital. The best example of this phenomenon is Hungary where the five major cities ranking after Budapest have a population number of about one third of that of the capital. The same may be seen in some small European countries, such as Austria, Denmark and Iceland and in some overseas states, for instance, Argentina, Uruguay and Paraguay.

When looking into the causes of the high share of population and industry in European capitals it should be remembered that they are more of a historical and socio-economic character, and cannot be entirely attributed to favourable geographical situations. In the initial stages of economic development the physical geography and socio-economic factors contributed in equal measure, although later the latter became dominant.

Throughout the world, especially in Europe, two points of view exist about the so-called overpopulated capital cities. According to the first capital cities are overpopulated, overcrowded, and overconcentrated in comparison with the rest of the country. As a rule capitals possess an overconcentration of people, of the forces of production, mainly those associated with manufacturing industry, but also of the nations' intellectual capacity. Such territorial disproportions must be regarded as undesirable, and according to the first viewpoint are not only disadvantageous but even cause damage to the country's economy. Consequently, the abnormal growth of capital cities must be stopped, or at least restrained and factories relocated. According to representatives of this viewpoint the main task of economic development must be

to help financially the countryside and to industrialize rapidly the major provincial cities.

According to the second viewpoint the concentration of the forces of production in capital cities must be regarded as a good thing. It is advantageous to the country's economy to have a capital city with a manysided manufacturing industry, which has excellent chance for inter-factory co-operation and combination. According to the economists and economic geographers holding this point of view the main task is to discover the advantages and to work out alternatives for their economic utilization.

Thus concerning the question of territorial development there are at least two opinions, which are directly opposed to each other. From the purely economic viewpoint of scale the concentration and integration of social production must be regarded as advantageous. Manufacturing industry concentrated at particular locations means cheaper production and more efficiency. The representatives of the second viewpoint regard the resulting overpopulation and overconcentration as a social problem. According to them one must not preserve the old inherited territorial differences in the country.

In Hungary also something has to be done to control the overgrowth of the capital city and the depopulation of the countryside. Therefore new works and factories must be established in the large provincial cities. This will lead firstly to the decentralization of the industry of Budapest, and secondly, to the partial preservation of the advantages derived from scale economies.

3. TRENDS OF DECENTRALIZATION IN HUNGARY

The areal disparities in the distribution of manufacturing industry contribute to overcrowding in the capital on the one hand, and restrain the industrialization of more backward areas on the other. Overcrowding can be relieved in a relatively short period, first by accelerating the rate of flat construction and by the intense development of communications and public utilities. Overcoming the difficulties produced by the disproportionate location of manufacturing industry takes a longer time, however. The detrimental effects can be eliminated by the planned development of manufacturing industry in the capital, by the intense industrialization of Transdanubia and certain regions of the Great Hungarian Plain and by the expansion of Miskolc, Debrecen, Szeged, Pécs and Győr as counterpoles to Budapest.

Although decreasing somewhat in the past 20 years, the dominance of Budapest cannot be regarded solely as an inheritance from the capitalist past, because even in the last 25 years industrial development has intensified its problems. Thus industrial output increased fivefold between 1948 and 1966, and although part of this can be attributed to higher productivity, at the same time the number of industrial workers increased by 250 per cent. According to future plans the further development of industry in Budapest will be realized by the more economic utilization of local labour reserves, and the rationalization of existing manpower.

The overconcentration of manufacturing industry in Budapest produced an excessive increase in population, namely 350 thousand persons between

1949 and 1970. Overcrowding is intensified by daily commuting—between 160 and 170 thousand persons— and by the considerable number of people travelling to the capital for other reasons, such as shopping, health reasons and tourism. Thus, the day-time population of the City amounts to some 2·2 million persons. The intense concentration of manufacturing industry to Budapest also sets a bar to the reasonable extension of production of the rest of the country. As Budapest is the national centre of production, its infrastructure is more highly developed than any other city, which in turn produces conditions favourable for further industrialization. At the same time reconstruction and modernization of the existing plant can be realized most economically here. Thus, the advantages of large-scale production derived from the concentration of industry must be effectively utilized in order to achieve high productive efficiency. In other words the disproportionate share of Budapest in manufacturing industry cannot be altered from one day to another, but will be a feature of the economy of Hungary for a long time in the future.

The decentralization of manufacturing industry creates a number of anomalies which must be reconciled.

(1) An uneven distribution of productive forces can be justified from the economic point of view. It is obvious that a considerable saving can be achieved by employing the labour force close to its dwelling place. However, on the other hand, a considerable saving can be achieved when plants are located near to each other, which has a favourable effect on technology, labour organization and prime costs. With few exceptions optimum plant size increases with mass production, technological development and with the concentration in the same area of complementary and auxiliary plant. It is specialization alone that acts in the opposite direction by permitting the production of semi-manufactured products in settlements distant from the mother plant. Of course, this only applies to products of relatively high value which can bear the increased costs of transportation.

(2) Considering the relative lack of capital in Hungary, the most important task of economic policy is the efficient utilization of existing plant. Thus, economic policy aims at increasing productivity through modernization and the application of modern technology. Yet this means the preservation of the existing territorial distribution of industry in which the surplus labour from agriculture not absorbed in factories in provincial towns streams into Budapest with the purpose of establishing a temporary or permanent residence there. Employment is easy to find in the cities as most factories try to step up output by increasing their labour intensiveness. A part of the surplus manpower flowing into the cities is absorbed by the construction industry which is still poorly mechanized. In summary it must be stressed that population migration to cities is a world phenomenon which would not be easy to check in any country at the present time.

(3) The road and railway network, and gas and water supplies focus on Budapest. The wide variety of specialist manpower and possibilities for cooperation also provide economic advantages for the plants located close to each other which in most cases more than counterbalance the disadvantages that are the concomitants of overcentralization. Because of the heterogeneity

and non-quantifiable nature of the active components, the comparison of advantages and disadvantages is frequently almost impossible.

(4) Another problem raised by the decentralization of industry is psychological. As Budapest has no industrial, cultural or scientific counterpoles, technical specialists quite naturally wish to work in the capital. However, at the same time provincial industry calls for the availability of the very best technical help, and this contradiction can only be eliminated by careful and efficient intervention.

It must also be mentioned that many of the suburbs that administratively do not form part of Budapest are "saturated" with manufacturing industry. They form a ring some 25–30 kilometres in width around Budapest which further increases the problems of the capital. The more important settlements in this industrial belt are Ercsi, Dunakeszi, Gödöllő, Aszód, Szigetszentmiklós, Vác and Budakalász.

With a view to overcoming the disadvantage resulting from overcrowding and the intense concentration of industrial plant, the further growth of manufacturing industry in Budapest and her environs is restricted by government legislation. A programme has been drawn up concerning the relocation of certain plants while it is forbidden to establish any additional factories in Budapest. These measures have already had a beneficient effect in that the proportion of industrial workers in Budapest has shown a declining trend since 1964. Thus in 1970 more than one-third of the total number of industrial workers were employed in Budapest, and only 38 per cent of total industrial output was supplied by the capital.

In 1966 industrial output in Budapest was four and a half times higher than in 1949. Industrial plant occupied 17 sq.km out of the total area of Budapest of 525 sq.km. In the same year round 611,000 labourers were employed in the 3371 factories of the capital, an average of 181 workers per plant. One may confidently predict that the data for 1975 will show that the systematic relocation and rationalization of plant will have reduced the proportion of manufacturing industry by a further 3 or 4 per cent.

In summary, after the First World War manufacturing industry developed in the already existing industrial districts of Budapest. However, new industrial agglomerations were created, and especially during the past 25 years a great number of new plants have been established and existing ones reconstructed or modernized. In spite of this fact, the majority of the plants are operating in obsolete buildings. Overcrowding, mainly in the old industrial districts which also contain residential quarters, places obstacles in the way of further industrial development. Their resettlement or modernization is a common task for the future industrialization and development of Budapest.

4. PRACTICAL PROBLEMS OF PLANT RELOCATION

It is known that about two fifths of all industrial activities in Hungary are situated in Budapest and its surroundings. In some rapidly developing sectors, this ratio is even higher. The rate of growth of Budapest industry determines to some extent the development of industry at a national level. Plant

relocation must be controlled in such a way as to help the development of industry in Budapest as well.

As a rule, industrial manpower shortages will prevail in Budapest, as has been the case for many years past. In some cases, especially in labour intensive and low paid activities, this lack of manpower may cause difficulties in both industrial production and the provision of services. The controls which have been introduced and the improvement in the manpower policy will, however, go a long way towards alleviating the manpower problems of the capital. Yet, those engaged in industrial development have to count on the present manpower shortage in Budapest remaining constant.

The further extension of industrial growth and production by the way of employing increased numbers of workers is impossible in Budapest. Due to the low birth rate the natural growth of the capital's population is low, while the number and proportion of aged people has increased considerably. For some years the number of city-dwellers attaining working age has been lower than that of those reaching pensionable age. Consequently, manpower for the manufacturing industry of Budapest has been recruited from in-migrants from the fringe areas. In some rural districts a part of the local population cannot, or for certain reasons does not want to work at the place of residence and has sought jobs in the industrially more developed areas, mainly in Budapest.

The factors generating internal migration are now disappearing. Consequently, a further increase in the number of migrants to Budapest (14–18 thousand persons annually) is unlikely, indeed a certain fall is probable. Because of an unhealthy age composition the capital's manpower will remain essentially at the present level during the period of 1971–1975. Therefore, factory managements should plan for tighter manpower resources than up to now. Consequently, the future development of the industry of Budapest should enable to meet the manpower demand of some highly developing sectors.

Besides, the favourable conditions for industrial growth in Budapest, for instance the already established works and factories, the manysided cooperation existing between them, the availability of skilled industrial workers, the good transport facilities and universities and technical research institutes, enable industrial production to be increased by the more efficient use of the available labour force, and improvements in productivity. The main methods of increasing productivity and making more efficient use of local manpower comprise both the application of up-to-date technology and engineering and the step by step redistribution of manufacturing industry. In addition some industries must be relocated in rural regions in order to release manpower to meet the labour demands of the remaining works and factories. Besides, the resettlement of certain factories will also contribute to the closure of obsolete plants and to the solution of certain city-planning problems.

Factories can be relocated in two ways: (*a*) certain factories in Budapest can be closed and their equipment relocated to new or extended factories outside the capital, or (*b*) certain of the activities of given Budapest factories can be resettled in other regions.

The relocation of factories outside Budapest is provided in government's

decrees. Factories designated by specialists for relocation mostly disrupt the population's living conditions and hinder city-planning, while their building is usually obsolete, equipment modernization and technological development requiring completely new constructions. Due to the high densities within the built-up areas neighbouring existing factory sites no further expansion is possible.

Of recent times the most used method for plant relocation is to establish new factories outside Budapest or to extend provincial affiliates already existing. The most advantageous method used for the extension of the capacity of a metropolitan factory is as follows: an enterprise with its headquarters in Budapest takes over buildings outside the capital suitable for the foundation of a new factory. In such a way, the metropolitan "mother" plant is able to implement future developmental plans more cheaply and at a relatively rapid rate.

The shifting of some production lines outside Budapest does not prevent the further development of the metropolitan enterprise. On the contrary, plant relocation promotes future development since manpower, buildings and other facilities thus released can be utilized more favourably. This is why the majority of metropolitan enterprises are ready to apply this method of industrial decentralization.

As a rule technically out-of-date factories which hinder city development were appointed for relocation. However, some manufacturing equipment cannot be shifted without difficulty because it is an integral part of the building and cannot be separated from it. As far as transportable equipment is concerned the factory shift is easier. However, taking into account that generally the technically obsolete enterprises were designated for relocation and at that some 5–10 years ago, the equipment must be both morally and technically already out-of-date. Now it is a question whether the dismantling, transportation and re-installation of fully or partly obsolete equipment is economically justified. Re-installation of old equipment usually means preserving out-of-date techniques.

The resettlement of designated metropolitan factories takes place with the help of a so-called industrial relocation fund which amounted to 250 million forints in 1968–1970 rising to some 800 million forints for the period 1971–1975. The plant relocation policy and the development of the industrial activities outside Budapest are fully co-ordinated, the factories being mainly shifted to economically backward areas and to coal-mining regions. The regional councils also subsidize plant relocation from an industrial development fund totalling about 200 million forints for the period 1971–1975.

In the near future plant relocation will promote a selective growth of Budapest manufacturing. As a rule those sectors are shifted which are not closely bound to factories in Budapest by the ties of co-operation. Generally their demand for skilled workers is not high, and after resettlement the limited manpower of Budapest may be used more efficiently. In certain cases, in the last few years even the absolute number of employees decreased in certain sectors where the share of skilled workers is low. Thus, in the period 1963–1967 the growth of personnel in the capital's engineering industry was about 2 per cent. Yet the number of earners in the metal hardware industry

dropped by four thousand persons, while that of precision engineering increased by three thousand persons.

As a result of factory relocation inmigration to Budapest has decreased considerably, and in connection with this the demand on infrastructural investment has also shown a declining tendency. During the period 1971–1975 plant relocation subsidies will amount to about one milliard forints. The plant relocation policy released some 15–20 thousand workers for the industrial sectors remaining in Budapest. If this manpower were to have been provided by migrants to Budapest, together with their families the demand on housing and other services would have required about 3–4 milliard forints.

III. STRUCTURE OF INDUSTRY

1. INDUSTRIAL SECTORS

At present the number of workers employed in heavy industry of Budapest is more than twice that in light industry and more than nine times that in the food trade. The machine and the iron and metal industries, respectively, employ more workers than the labour intensive light industrial and food sectors combined. With the exception of coal and ore mining, bauxite production, aluminium-metallurgy, iron smelting, and cement production, all types of heavy industry are at present to be found in Budapest. In addition to many machine works which form the core of heavy industry, a whole range of plants in the metallurgy, chemical, and building-materials sectors can be found in the Hungarian capital.

Similarly, all the branches of the textile industry are represented in Budapest with cotton and wool manufacture holding the lead. Leather and shoe production, and the paper, wood processing, and printing industries are also well developed. Admittedly the latter play but a modest role in the structure of Budapest industry, although they do employ a significant number of workers, and make an important contribution to the value of total output.

By comparison the structure of industry in other Hungarian cities is less varied and in the majority of cases highly specialized (Table VII). Thus in Miskolc more than 90 per cent of the workers in the town are engaged in heavy industry—metallurgy, machines and mining. Two-thirds and nearly three-quarters respectively of the industrial workers in Pécs and Tatabánya are miners. In Győr and Szeged approximately 40 per cent are employed in the textile industry. Only Debrecen can rival Budapest as far as the variety of manufacturing industry is concerned (Figs 1 and 2).

Beside sectors typical of "large cities", there are also a number of heavy industrial plants in Budapest engaged in the primary processing of raw materials, which are of large volume and difficult to transport. Thus, the construction of "heavy machines", for instance, mining equipment, ships, electric trains, and cranes, are of considerable importance. The chemical industry, in addition to manufacturing paints, lacquers, drugs and cosmetics, also produces sulphuric acid, chlorine, soda, chemical fertilizers, and insecticides and pesticides. Raw materials of great volume and low value are also utilized in the wood processing plants, as well as in the various branches of the food industry.

From the dismission so far it is thus clear that in those sectors of manufacturing industry which employ a large number of highly skilled workers and

TABLE VII

Industrial branch structure by person employed in Budapest and in some large cities, 1959*

Industrial branch	Budapest	Miskolc	Győr	Pécs	Szeged	Tatabánya	Debrecen
Mining	—	11	—	66	—	73	—
Primary metal industries	5	40	4	—	1	4	—
Machinery and fabricated metal products	35	30	39	3	2	3	30
Instruments	8	—	3	1	3	—	5
Building materials	4	5	1	8	3	11	6
Chemicals	6	1	2	3	1	1	5
Electric power	2	4	5	5	4	6	5
Textiles	18	2	35	3	42	—	14
Leather and leather products	3	—	—	2	6	—	4
Lumber and wood products	7	2	2	1	13	—	10
Food	8	4	9	7	22	2	19
Miscellaneous	3	1	—	1	3	—	2
Industrial research institutes	1	—	—	—	—	—	—
Total in per cent	100	100	100	100	100	100	100
in thousands	442·9	42·2	26·0	24·7	20·3	18·4	15·8
Employment in 1970	602·3	53·5	42·0	37·2	35·4	24·7	34·5

* The data have been extracted from the individual factories and summarized for the industrial branches and centres by the author.

a staff in close touch with technical research are most developed in Budapest. At the same time branches requiring considerable energy, for instance, electro-metallurgy, are also characteristic of the manufacturing industry of Budapest as are those where bulky raw materials are processed as in the steel and metal, heavy chemical and heavy engineering industries.

The structure of manufacturing industry in Budapest is equally characterized by the presence of both traditional and modern sectors, electric engines, instruments, electronic and telecommunication equipment belonging to the latter. A typical feature of Budapest manufacturing industry is the comparatively late development of some of its branches. Thus the machine-tools, motor-bus and lorry construction and the clothing and knit-ware sectors only reached the manufacturing stage after the second world war. Indeed, the industrial aspect of Budapest is still mainly determined by such traditional branches as rolling stock construction, textile manufacture and various facets of the food industry.

It should be noted, however, that after 1945, specialization, technology, the labour relations of many of the so-called "traditional" branches changed to such an extent in terms of specialization, technology and labour relations that today the idea of a "traditional industry" is quite different from former times.

Out of the 19 printing firms of the country, 17 are to be found in Budapest, and the most important political, cultural and science periodicals are pub-

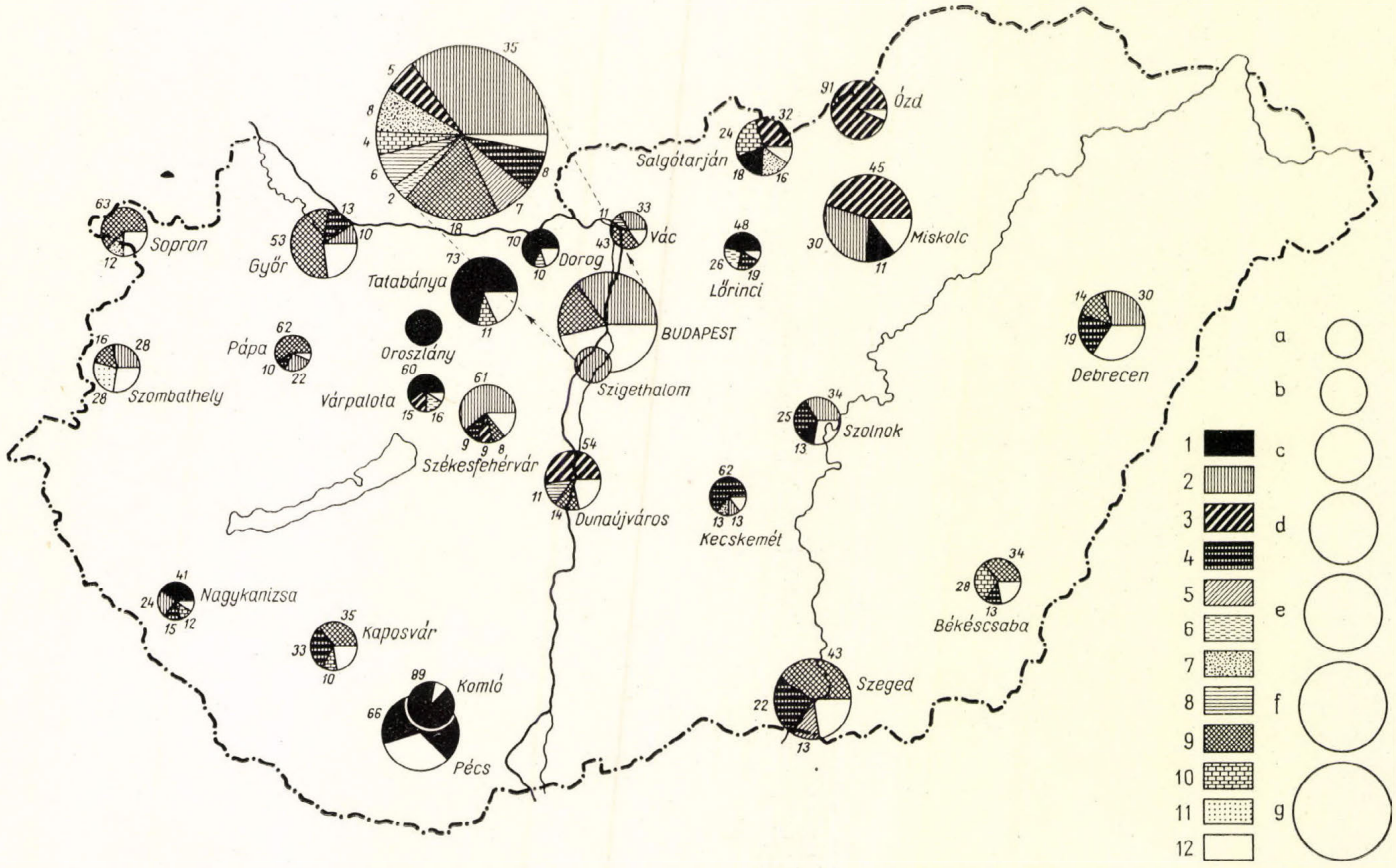


Fig. 1. Structure of manufacturing industry in the leading industrial settlements (according to number of workers)
1 = extraction industry; 2 = engineering industry; 3 = iron and metal processing; 4 = food industry; 5 = wood, paper and printing industry; = 6 electrical generation industry; 7 = precision industry; 8 = chemical industry; 9 = textile industry; 10 = building materials; 11 = leather and leather products; 12 = others
a = 5–8; b = 8–10; c = 10–15; d = 15–20; e = 20–30; f = 50; g = cca. 600 thousand workers

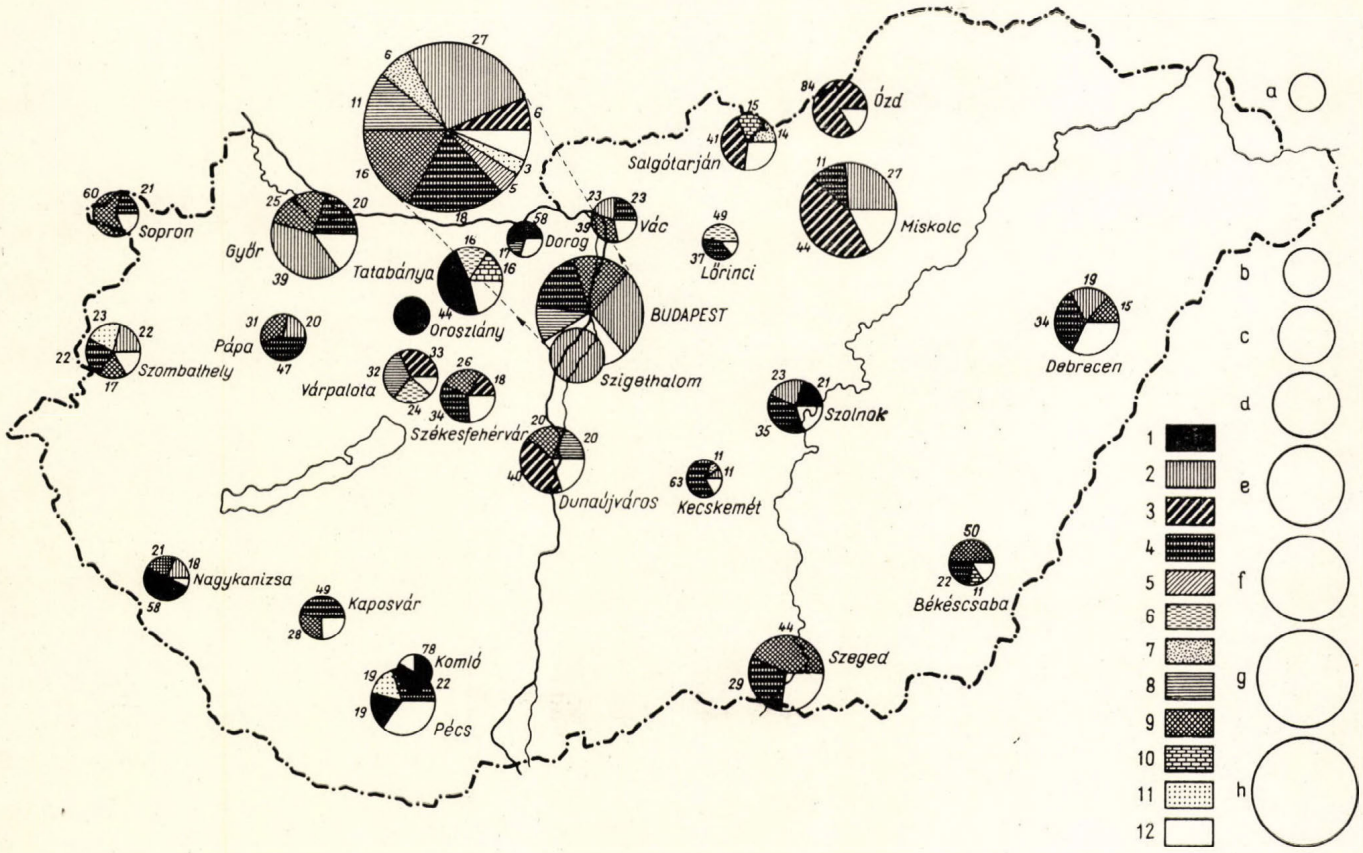


Fig. 2. Structure of manufacturing industry in the leading industrial settlements (according to the value of production)
1–12 = see Fig. 1.
a = 0·2–0·5; b = 0·5–0·8; c = 0·8–1·0; d = 1·0–1·5; e = 1·5–2·0; f = 2·5; g = 3·3; h = 50 milliard forints

lished there as well as 85 per cent of all books. Budapest has neither in the field of industry, nor in cultural affairs such counterparts as Cracow is to Warsaw, Bratislava to Prague, Zagreb to Belgrade or Cluj to Bucharest.

Paper production in close connection with the printing trade was similarly placed in Budapest. It is sufficient to mention that the largest paper mill at Csepel supplies one-third of all paper produced in the country.

The *textile-clothing sector* developed considerably after 1945 which coincided with its nationalization. Although planning assigned future expansion in this industry to the provinces, the proportion in Budapest still exceeds 50 per cent. Considerable exports are effected by the clothing industry in Budapest, mostly to the Soviet Union.

The *shoe-industry* is a relatively young branch. Prior to 1945 it was a small-scale handicraft industry employing a restricted number of journeymen. Of the 14 modern shoe-factories working at present six are in the capital and employ about two fifths of total workers in the sector. It should also be mentioned that hand-made shoes produced by cooperative workshops and individual craftsmen are still very popular both at home and abroad.

Prior to 1945 *furniture production* was carried out on a small scale only, workshops being located in the basements of houses. Nevertheless, in that period style and modern furniture produced by cabinet-makers in Budapest, mostly by hand, was in demand all over Europe. Since 1945 the industry has been rationalized. Hungarian furniture is popular in the Soviet Union, Belgium, France and Great Britain.

The rapid growth of Budapest at the close of the last century gave an impetus to brick manufacture which was also encouraged by an abundance of excellent quality Kiscell clay. Brickworks were located at Óbuda, Kőbánya and Pestlőrinc. At present 18 per cent of all bricks and 33 per cent of roof-tiles are produced in Budapest. Additionally works producing prefabricated sections for the building industry was established in 1966. Parallel with this development, the output of the old brickworks will have to be reduced, especially since the clay-pits are now becoming exhausted.

Six thermal electricity generating stations are in operation in Budapest. Those at Kelenföld and Csepel are of 150 MW capacity. The capital is supposed to contain 32 per cent of the total capacity of Hungarian power-stations but owing to certain inefficiency, they only produce 28 per cent of total power output. As 41 per cent of electricity produced in Hungary is for industrial and domestic use in Budapest, the deficit is made up by transmission from Bánhida in County Komárom, Mátravidék in County Heves as well as imports from Czechoslovakia.

A hydro-electric power station to be built 40 km north of Budapest near Visegrád, and the thermal power-station 30 km south of the capital at Százhalombatta utilizing Soviet oil will solve the aggravating power troubles not only of Budapest but also of the surrounding region. The industrial plants of Budapest consume between one-quarter and one-fifth of all coal mined in the country. Tatabánya and Dorog supply over 40 per cent, and Nógrád about 24 per cent of the coal consumed by the capital.

In the last few years natural gas has been gaining ground rapidly, and a number of plants in Budapest have changed over to this fuel.

2. THE ENGINEERING AND FABRICATED METAL MANUFACTURE

A. PROFILES AND LEADING FACTORIES

The engineering and fabricated metal industry of Budapest employed 273,400 persons in 1969, i.e. 44·7 per cent of the total number of workers in nationalized industry in Budapest. In 1969 some 53·6 per cent of all workers in this sector worked in plants in the capital. More meaningful than the above data is, however, the fact that the largest, most important, most versatile and relatively most specialized plants of the Hungarian engineering industry are concentrated in Budapest (Fig. 3).

A large number of engineering works is also characteristic of the manufacturing industry of the capital, and at present about 125 such works each

Fig. 3. Location of the engineering industry
1 = Machine and machinery building industry; 2 = production of electrical machines and appliances; 3 = telecommunications and vacuum engineering; 4 = precision engineering; 5 = iron and metal mass products
a = 100–300; b = 300–500; c = 500–1000; d = 1000–2000, e = 2000–5000, f = 5000–10,000 workers; g = Csepel Iron and Metal Works (cca 40,000 workers)

employ more than 100 workers, the Iron- and Metal-works at Csepel being the largest employing about 40,000 workers. In terms of the number of workers employed in the industry Budapest has no rival among the capitals of the surrounding countries. The high degree of concentration in the engineering industry is a typical Hungarian phenomenon which can be accounted for by historical, social and economic factors.

Various sectors of the engineering and metal industry were relatively well developed in Budapest prior to the First World War. The "Ganz" company as mentioned in the introductory chapter were engaged in the construction of rolling stock, electric engines, paddle steamers. "Weiss Manfred" concentrated on the production of armament, while "Láng" produced steam engines, and plant equipment. "Mávag" was the leading manufacturer of steam engines and heavy machinery, while "Tungsram" ("Egyesült Izzó") was the largest vacuum-engineering works with subsidiary branches in some countries in Western Europe.

Prior to the Second World War Győr and Diósgyőr were the only centres of the engineering industry outside Budapest where finished products were manufactured. Machines of a more complicated structure and requiring more professional skill were built almost exclusively in Budapest. In spite of its high degree of concentration some branches of the engineering industry in Budapest developed an unbalanced structure between the two world wars, neglecting the economic interest of the country and reflecting the dependence of pre-war Hungary on the leading capitalist countries.

Thus the import of many important spare parts was high. Precision products—for instance, bearings and basic instruments, which required a great deal of skill rather than raw material were imported with few exceptions mainly from Germany. Additionally, some factories in Budapest for example Standard, Siemens, Bosch, AEG, Brown-Bovery and Philips, operated as branches of foreign firms and only assembled parts manufactured abroad. Instruments were manufactured at the handicraft level there being virtually no Hungarian machine-tool manufacture in Budapest. A further feature was that the international nature of many of the companies resulted in closer ties in many instances with foreign engineering works than with neighbouring plants in Budapest.

The narrowness of the home market and restricted export possibilities were further inhibiting factors. Thus so few ships were launched annually by the shipyards of Budapest that to retain the skilled labour force, arrangements had to be made for the manufacture of various other iron and metal products, for instance, miners' trucks. Not even the building of electric engines traditional to Budapest and suiting the given economic conditions of the country was properly developed in so far as the manufacturing technology used was obsolete. Even so, many products from this sector such as electric bulbs, transformers and Kandó-locomotives, etc. acquired a world-wide reputation.

The uncertainty of demand in the home and international machine markets caused the competing engineering plants to increase the variety of products offered in order to create a broadly based order book all at the expense of serial production. Proprietors endeavoured to solve their problems within their individual plant, and so for instance, spare parts were manufactured

at home, in the interests of maintaining production, in most cases at well above world market prices.

Consequently, most Budapest engineering works assumed a heterogeneous character between the two world wars. Both small and large plants acted identically in this respect, protected themselves against falling orders and stagnation by means of broadly based production, machine-repair, assembly and overhaul.

After 1945 the growth rate of the Hungarian economy as a whole was largely dependent upon the developmental rhythm of the engineering industry in Budapest, through the supply of machines, equipment and instruments, etc. The first three- and five-year plans were fulfilled without the assistance of foreign loans. The uninterrupted increase in coal production, and the large-scale mechanization of mining contributed to the foundation of specialized plants for the manufacture of mining equipment.

The need to supply agriculture with home-produced machinery was the reason for the establishment of the specialized "Red Star Tractor Works" and the "Emag", Agricultural Engineering Works of Budapest which concentrated on the production of combine harvesters.* Similar reasons induced the manufacture in Budapest of machines for light industry.

Side by side with the above, specialization was stated within individual plants of the engineering industry in Budapest. For instance, "Mávag" had formerly manufactured steam engines, compressors, lorries, motor buses, tractors and threshing-machines, but recently has concentrated upon steam-engines and compressors. Formerly the "Hofherr Tractor Works" (at present "Red Star") and the Hungarian Railway Car and Engineering Works in Győr had also been engaged in tractor manufacture beside "Mávag". After specialization tractors only were produced by the "Hofherr Works".

Within a socialist planned economy increased specialization is a permanent and definite task, the rate of which is increasing for economic, political, technological and cooperative reasons. Between 1949 and 1951 plant-specialization became necessary owing to the haphazard production methods of the nationalized engineering works. From 1960 the stimulant has been international agreements within the framework of the Council for Mutual Economic Assistance (CMEA). In harmony with the objectives, the traditional industrial sectors, i.e. railway carriages, electric engines and telecommunication equipment were expanded rapidly during the second five-year plan (1961 to 1964) as were those requiring relatively small inputs of raw material and labour, i.e. instruments, precision machine-tools and motor-buses. The manufacture of complete plant equipment is projected for rapid growth in the future.

Specialization also means a reduction in the number of products, an increased serial production, as well as cooperation between factories in the capital and those in the provinces. It will in addition facilitate the decentralization of the engineering industry and the industrialization of the provinces. The latter process is retarded at present by the close cooperation between the engineering works of Budapest. The largest factories frequently subcon-

* Ener stopped the manufacture of combine harvesters in 1963, continuing its activity within the Csepel Works as a telecommunication engineering plant.

tract to dozens of other plants in the capital, and as a consequence further development of many sectors of the engineering industry in Budapest seems likely.

The large and small plants in Budapest are being reorganized into a coordinated system whereby their former character is radically changed. Thus today a finished product can require collaboration between 50 and 60 smaller and larger plants. To give a concrete example, the "Csepel Motor Works" cooperate with 240 other Hungarian and foreign plants and the two large shipyards in Budapest with almost as many. It is clear that in plants specializing on a single product, it is easier to raise labour productivity, increase the rate of serial production, and reduce production costs, than in a heterogeneous plant.

Specialization in the engineering works in the capital had a favourable effect on provincial industrial plants as early as 1949 to 1951. Thus, for instance, the new production schedule at the "Ganz" Electric Works resulted in the establishment of a new plant to manufacture electric meters at Gödöllő. Specialization in the "Ganz" Railway Car Works induced the establishment of a chipping engine plant at Jászberény. With the "Red Star" (Hofherr) Tractor Works becoming the centre for the manufacture of Hungarian tractors, the production of small machines and implements for agriculture has been transferred to Törökszentmiklós and Makó.

Factors have also been working against this positive decentralization process. Expert opinion tended to consider that the enlargement of existing plant and the establishment of new engineering works in Budapest would be most economic, since costs in terms of social and public utilities and infrastructure improvement would be at a minimum. The manufacture of mining equipment in contrast requires large quantities of steel and should therefore be located as far as possible close to markets and metallurgical centres; such towns as Ózd, Miskolc and Salgótarján meet both requirements.

A further argument against specialization and decentralization was that the establishment of plants in the provinces would raise difficulties over cooperation between the affiliates and the mother plant, thus hindering production. Delayed deliveries by one plant would be transmitted through the whole manufacturing system delaying production in the other plants as well. To prevent this, managers frequently oppose the transfer of production to plants elsewhere. Thus, for instance, the engineering plants in the capital, which prior to 1945 had their own foundry works, were against the establishment of a new central specialized foundry, and tried to retain their own obsolete low productivity foundries.

For the above reasons, the high concentration of the engineering industry in Budapest could not be radically changed, and about 45 per cent of new employees during the first five-year plan were engaged by the engineering plants in Budapest.

The creation of new industrial sectors increased specialization and instances of relocation in the provinces, meant, however, that after the Second World War the engineering industry in Budapest became more versatile, and more complex, than it had been before. By mergers, proper specialization and judicious investment, a modern large-scale *machine-tool industry* has been estab-

lished and successfully entered into the export market. Similarly, after the war an *instrument industry* came into existence. Essentially the same can be said of the tractor and vehicle industry, though each of the leading plants had experimented during the interwar period with tractor manufacture. In the vehicle and tractor industry specialization could only be achieved after nationalization. The ship-building industry with its great past has since 1950 onwards been building Danube and sea-going boats, river tugboats, and passenger steamers, mainly for the Soviet Union.

The proportion of the engineering industry of the country located in Budapest is still rather high, though since 1945 many engineering factories have been established in the provinces. As seen in Tables VIII and IX, of the total number of workers in the engineering industry nearly 70 per cent are employed in Budapest. In some sectors such as electrotechnics, instruments and machine-tools the capitals' share is even greater. Notwithstanding the fact that after 1945 the building of agricultural machines was first developed in the provinces even in this sector, the proportion in Budapest has risen to 36 per cent, an inheritance from the capitalist past (this is the only branch of the engineering industry in which more than half of the workers are employed in the provinces).

The manufacture of rolling stock and electric engines is outstanding in Budapest, employing about half the total workers of the engineering industry. These are undoubtedly the two branches most typical of capital cities.

In keeping with the provisions of the second five-year plan the proportion of labour-intensive sectors in the capital requiring little input of raw materials such as diesel engines, telecommunication equipment, instruments and ma-

TABLE VIII

Budapest's share in the engineering industry of Hungary

Branches of the engineering industry	Thousands of workers						Share of Budapest (per cent)		
	Hungary			Budapest					
	1960	1967	1969	1960	1967	1969	1960	1967	1969
Machine and machinery building industry	82·0	103·4	143·3	46·1	56·2	58·8	56·2	54·4	41·0
Production of vehicles	104·3	120·3	123·1	57·4	61·4	60·3	55·0	51·0	49·0
Production of electrical machines and appliances	33·4	44·9	51·6	29·3	29·7	35·1	87·7	66·1	68·0
Telecommunications and vacuum engineering	45·0	70·8	80·8	37·1	48·0	51·5	82·4	67·8	63·7
Precision engineering	29·4	41·1	43·1	22·6	30·1	35·0	76·9	73·2	81·2
Iron and metal mass products	49·3	54·1	68·2	28·5	24·6	32·7	57·9	45·5	47·9
Total	343·4	434·6	510·1	221·0	250·0	273·4	64·4	57·5	53·6
Index (1960 = 100)	100	127	149	100	113	124	100	89	83

TABLE IX

Structure of the engineering industry (in per cent)

Branches of the engineering industry	Hungary			Budapest		
	1960	1967	1969	1960	1967	1969
Machine and machinery building industry	23·9	23·8	28·1	20·9	22·5	21·5
Production of vehicles	30·3	27·6	24·1	26·0	24·6	22·1
Production of electrical machines and appliances	9·7	10·3	10·1	13·1	11·9	12·8
Telecommunications and vacuum engineering	13·1	16·3	15·8	16·9	19·2	18·8
Precision engineering	8·6	9·5	8·4	10·2	12·0	12·8
Iron and metal mass products	14·4	12·5	13·5	12·9	9·8	12·0
Total	100·0	100·0	100·0	100·0	100·0	100·0

chine-tools will increase while that of ship-building and the manufacture of agricultural machinery will decrease. Yet at present, the engineering industry of Budapest is still a large consumer of iron and steel, which is used mainly in the construction of steel structures, bridges, mining machines, locomotives and ships. In order to satisfy the high iron and steel demand of the engineering industry a number of steel plants are located in Budapest.* The "Csepel Works" manufactures steel from the pig and scrap iron of Dunaújváros. The largest pipe and tube producing plant in the country is also associated to this company as is a high capacity foundry and forging plant. About 15 per cent of Siemens-Martin steel, one-quarter of electric steel, and between 15 and 17 per cent of all rolled steel produced in the country are manufactured by the "Csepel Works". The Kőbánya "Iron and Steel Works", the "Steel Pipe Works" and the "Hungarian Steel Works" also supply considerable quantities of raw material to the engineering industry in Budapest.

Beside the "Csepel Works" other plants are engaged in the metallurgy of non-ferrous metals, among them "Metallochemia" of Nagytétény, which utilizes scrap. A deficiency in this plant, however, is the absence of a non-ferrous metal rolling mill, which has to be carried out in other plants in the capital, for instance, in Csepel.

The "Light Metal Works of Kőbánya" engaged in aluminium rolling receives aluminium blocks from the furnaces at Inota and Tatabánya. Its finished product, aluminium foil, is utilized chiefly by the food industry and to some extent in the engineering plants of the capital.

Foundry output since 1945 has been insufficient to satisfy the requirements of the engineering industry in Budapest.** The merger of existing foundries

* 18,586 workers were employed in steel and other metal plants in 1962.

** The Iron Foundry at Soroksár producing cast iron is the first to form part of the centralized supply chain.

into one large company on January 1st 1963 has contributed to the solution of the problem.

The important role of the Budapest engineering industry in the economic life of the country becomes clear when it is considered that about 90 per cent of total engineering exports are derived from factories in the capital. This represents a rise from approximately 35 per cent in the early 1960s. Prior to 1945 only a few engineering products such as locomotives, electrical goods and vacuum technical products were regularly exported but since then the export of products which previously were not manufactured in any considerable quantity, for instance, machine tools, motor buses, instruments and television sets, has been started. In addition, complete plant equipment, such as hydro-electric and thermal power stations, machine-tool plants, complete electric bulb factories, radio transmitter plants, and automatic telephone exchanges, are being sold abroad. Chemical and food processing plant manufactures are sent mainly to the Soviet Union and at present about 25 per cent of total engineering exports is composed of complete plant equipment compared with only 10 per cent in 1967. The export of complete plant equipment is profitable not only because the export of items which singly are non-exportable becomes possible but also because the planned coordination of a number of different engineering works is facilitated.

On the basis of a number of workers employed the manufacture of transportation equipment is the most important branch within the engineering industry of Budapest. Although this sector started to develop rapidly after 1945, it continued to manufacture the traditional produces, i.e. steamships, steam engines, locomotives, railway trucks and heavy caterpillar tractors. Notwithstanding this, a few of the post-1945 specialisms, such as motor bus and lorry construction, have become considerable. By the end of the 1950s arrangements had been made to change over to the manufacture of diesel instead of steam rail-locomotives and water-craft, which incidentally boosted export prospects.

The "*Ganz-Mávag Locomotive and Engineering Works*"* was most directly affected by the programme of dieselization, it being the most important plant in this industrial branch and the second largest one in Budapest employing 17,000 workers. They ceased the manufacture of steam locomotives, and electric, diesel-electric and hydraulic locomotives became their most important products. A licence was also obtained abroad for the construction of 3000 HP silicon-rectified electric locomotives, the production of which commenced in 1963. In addition to locomotives multiple rail units, tramcars, water turbines and compressors are important products, while it also has the largest steel assembly plant in the country. While specializing to meet the domestic demand for diesel and electric locomotives it has also been found advisable to coordinate production programmes of other socialist countries.

Hungarian locomotive production concentrated in "Ganz-Mávag Locomotive and Machine Works" will develop according to the preliminary plans until 1975 as follows (1960 = 100).

* Mávag and Ganz Wagon were merged in 1958.

Type of locomotive	Volume index for annual production			
	1960	1965	1970	1975
Diesel locomotives	100	170	220	290
Electric locomotives	100	100	200	250

The centre of Hungarian motor-vehicle production is also in Budapest. Prior to 1945 only small-scale plants existed, lorries being produced by the "Mávag" company. Modern production methods could only be introduced after the Second World War by concentrating production, and incorporating the aircraft industry started during the war in Budapest, and the aircraft works grew the "Csepel Motor Works"* and the "Ikarus" Company. The industry is also represented by five other plants in the capital and two in the provinces. The latter specialize mainly in the manufacture of spare parts.

The "Csepel Motor Works" grew out of old "Danube Aircraft Works" at Szigethalom in 1949. They obtained a licence from the Austrian Steyer Co. to manufacture diesel engines for a standard 3·5 ton lorry. The production capacity was increased to 6500 lorries annually, although later reapprovals of the technical possibilities of the plant led to a gradual reduction in output to 3000 lorries annually after 1953. In 1960 the plant changed over to the manufacture of special bulk-transport lorries. Besides the latter engines are also produced for the "Red Star Tractor Works", for "Ikarus" buses, "Ganz-Mávag" compressors and small ferries constructed at Vác Shipyard.

The "Ikarus Motor Works" constructs 3·5 to 7 ton buses, for both town and long distance use, five thirds of which are destined for export. Recently work was started on the construction of so-called "jointed" buses, capable of accommodating 180 passengers. Additionally mobile laboratories, X-ray and dentist surgeries, fire-engines and trolley buses are constructed in the plant mainly for home use.

Bus production rose from 400 vehicles in 1950 to 1350 by 1966, and because of its stability further expansion of Hungarian bus production has been decided upon. Thus taking production in 1960 to be 100, output in 1965 was 120 and in 1970 and 1975 is expected to rise to 140 and 170 respectively.

The "Red Star Tractor Works" has specialized exclusively in producing tractors and dumper trucks since 1945. Further rationalization is planned, the construction of caterpillar tractors has already ceased and the production of universal tractors will soon be stopped as well so that the plant can concentrate exclusively on turning out high performance versatile four wheel drive tractors. A planned production of 10,000 units annually will supply both the home market and those of the CMEA countries.

* The "Csepel Motor Works" can be qualified as a plant of Budapest, due to its production, cooperative and labour connections, though situated a few kilometres outside the administrative boundary of Budapest.

Dumpers are likewise produced exclusively by the "Red Star Tractor Works". Production reached to 1600 units in 1953 but has since dropped to roughly 500 annually. It is planned to concentrate on dumpers capable of transporting 3·5 cu.m.

Since 1953 motor cycles have been manufactured by the "Danuvia Machine-Tool Works". Machines of 100, 125 and 250 c.c. capacity are produced for both the home and export markets, production amounting to 60–70,000 per year. More recently motor scooters have also been manufactured at Csepel.

As to the future only the manufacture of buses and motor-cycles look like being profitable. Internal demand for cars and standard lorries will be covered by imports.

The *Hungarian shipbuilding industry* with nearly 150 years of production experience could not obtain regular orders during the inter-war period.

The "Ganz Shipyards ad Crane Factory" builds Danube- and sea-going vessels, marine motor-cargo boats, and floating cranes mainly to Soviet orders. Since 1960 the capacity of the Shipyards has been increased considerably as shown in the following table.

Growth in the capacity of the "Ganz Shipyard"

Period	Annual shipbuilding capacity expressed as 1100 ton ship units
1935 to 1943	2·5
1946 to 1949	5·8
1950 to 1954	12·5
in 1955	22·4
1956 to 1960	29·8
1960 to 1970	38·2

Future building plans for the Shipyards include marine cargo ships for transporting timber of about 2500 ton capacity, and floating cranes capable of handling 150 ton loads.

The *Shipyards of Óbuda* specialized in building 450 HP passenger steamers, and 400 HP steam tug boats until the end of 1959. 71 of the former and 108 of the latter were built to Soviet order. After 1956 the Shipyards developed an 800 HP diesel river-tug for domestic use, a 660 HP diesel sea-port tug, a 1200 HP diesel push tug, and an 800 HP diesel river-passenger boat. The construction of a 2000 HP river push-tug is planned in which foreign customers have shown interest.

Apart from those in the capital only two smaller shipyards are in operation at Vác and Balatonfüred, which together employ about 15 per cent of the shipbuilding labour force in Hungary.

The *production of electric engines* is the second most important branch of the engineering and metal industry in the capital. While some important plants are located in the provinces, the largest among them being the "Railway Car and Engineering Works" at Győr, all the more significant factories

contributing more than 95 per cent of total production are situated in the capital. The "Ganz Electric Engine Works" is the largest factory of the sector in Budapest, constructing high performance engines, electrical equipment, electric and diesel-electric locomotives, turbo- and hydro-generators and transformers.

Other important electrical engine plants in Budapest are the "Electric Engine and Cable Works", the "Dynamo Electric Engine Works", the "Ganz Switches and Appliances" factory, the "Ottó Bláthy Electric Engine Works", the "Kontakta, Transformer and Electric Engine Works", and the "Transformer Plant" of the Csepel Works. Electric cable production is similarly concentrated in Budapest. The decentralization of the sector to the provinces is planned.

The *telecommunication and electric light industry* is similarly concentrated in Budapest, because of its relatively low basic material requirements, the abundance of skilled labour, and the breadth of the research work in the sector carried out in the capital. In addition the majority of spare parts, instruments and precision articles are supplied by other plants in Budapest.

Among the plants manufacturing electrical vacuum commodities the "Tungsram" (Egyesült Izzó) Company is outstanding, alone employing about ten thousand workers. In the manufacture of radio-valves, neon lights and light bulbs, as well as in the production of transmitting and television tubes, the plant is a world leader. The high level of technical achievement is demonstrated by the fact that Tungsram products are mainly exported to other industrially developed countries, for instance, the Soviet Union, East- and West Germany and Sweden. The company is also engaged in the manufacture of equipment for the production of electric bulbs and neon-tubing which is exported to the Soviet Union and India.

The "Beloiannis" (formerly "Standard") Works of Budapest produces telecommunication equipment, telephone exchanges and radio transmitters, as does the "Orion Works" while the "Remix" Company concentrates on radio spare parts. In line with CMEA policy the manufacture of radio and television sets was stopped by the "Orion" Company in 1965, and transferred to Bulgaria. In their place, the company manufactures micro-short-wave equipment. Owing to the vast domestic and CMEA demand for its products, the telecommunication engineering industry is, together with instrument production, the most rapidly developing sector of the engineering industry. It is continually undergoing rationalization to meet changing demand patterns and to increase economic profitability.

After 1945 modern instrument manufacturing gradually increased its role and importance within the engineering industry in Budapest, as demand generated by industrialization at home and abroad rose. Its most important products are: geophysical, electronic and nuclear instruments, as well as quality and production testing equipment. Thus Hungary fulfils an important world role in the manufacture and export of medical, dental and X-ray instruments. On account of the need for skilled workers and the close connections that must exist with industrial research institution this industry is located in Budapest, from whose factories more than 90 per cent of total instrument output is derived.

One of the problems of the instrument industry waiting for solution is the dispersal of existing plant. The 16 instrument firms in Budapest produce their commodities in 81 plants the amalgamation and rationalization of which would considerably increase productivity. A further production problem, which indeed is common to the entire Hungarian engineering industry but particularly affects the instrument and machine-tool industry is that their weight to value ratio is higher than for similar commodities produced by other countries. This reduces the profitability of instrument export, and on account of high raw material consumption, impairs the balance of the national economy.

The majority of plants belonging to the machine-tool industry are located in Budapest. In magnitude the "Machine-tool Factory at Csepel", producing radial drilling machines, and the "Metalware and Machine-tool Works", are the most significant. In general between 40 and 75 per cent of total output is exported.

In both sectors a healthy specialization programme was started at the end of the 1950s. As a result instrument production has attained a high international standard in the field of electric, medical, geodesic and geophysical equipment which warrants further development. On the other hand, during the second five-year plan the machine-tool plants gradually turned to the manufacture of more complicated machine-tools, i.e. programme-controlled machines, automatic production lines, gear milling machines and modern and economic metal spinning tools.

General industrial engineering, i.e. the production of steam and water turbines, diesel-engines, boilers, refrigerating machines, radiators, elevators and lifts, is also concentrated in Budapest. The most important productive units of this sector are the "Láng Machine Works" (turbines, ship-engines and plant equipment), the "Smaller Engine and Machine Works" (pumps and diesel-engines), the "Gábor Áron Iron Foundry and Machine Works" (gas generators), and the "April 4th Machine Works" (boilers and refrigerating machines).

Turbine production in the "Láng Machine Works" is one of the most valuable domestic assets of the electricity generating industry. The largest turbine so far built was of 50 MW capacity, while 100 MW units are entering the production stage. In cooperation with the electrical engineering industry the above company exports a considerable portion of its products and in the last 10 years thermal generating equipment had been delivered to Bulgaria, China, Poland and Vietnam as well as to the United Arab Republic and Syria. Furthermore complete tin processing factories were exported to the Soviet Union, and refrigerator and oxygen plants to Argentina.

B. THE GROUPING WITHIN ENGINEERING INDUSTRIES*

Taking into consideration the organization and productive structure, the nature of their interrelations and the place they occupy in the manufacturing industry of the country, the 150 engineering plants in Budapest may be divided into three groups.

Those belonging to the *first group* are of heterogeneous character with multiple production linkages. They comprise the largest engineering factories in the capital, employ the highest number of workers and work in collaboration to produce their finished articles.

The "Csepel Iron and Metal Works", "Ganz-Mávag", "Egyesült Izzó", the "Ganz Electric Engine Works", the "Csepel Motor-car Works", the "Hungarian Ship and Craneyard", and the "Red Star Tractor Works" fall into this group.

The core of the engineering industry of Budapest is formed by these works which employ more than 40 per cent of the engineering workers in Budapest, approximately half of whom are engaged in the "Csepel Iron and Metal Works". Beside the Csepel Concern, 10 to 20 thousand workers are employed in "Ganz-Mávag" and "Egyesült Izzó".

The *second group* of engineering works in the capital comprises plants with narrower production scale than the preceding group. 21 machine works belong to this group, among them "Ikarus", the "Telecommunication Technical Machine Works" of Budapest, the "April 4th Machine Works", the "Láng Machine Works", the "Machine-tool Works of Budapest", the "Orion Works" and the "Telephone Works". The number of workers in this group of plants varies from 800 to 3000 About one-fifth of the engineering workers in the capital are employed by this group of companies.

It is characteristic of the organization and production of the engineering works in this group that they lack auxiliary plant. Thus, for instance, they have no foundries** and depend on either the "Iron Foundry" at Soroksár or those belonging to factories in the first group of companies. Production equipment within this group of plants is generally more up-to-date than that of the engineering works in the first group. Economic production is in medium-size runs, because of this fact and single product specialization.

Spare parts and armature manufacturing plants, hand-tool factories, small plants for repairs and overhaul and industrial metalware producing plants

* The following enumeration of the names of districts as emerged in the course of the historical development of the Hungarian capital, and largely in current use even today, is given in order to facilitate orientation in the Map of Budapest.
District I = Vár; II = Pesthidegkút; III = Óbuda; IV = Újpest; V = City; VI = Terézváros; VII = Erzsébetváros; VIII = Józsefváros; IX = Ferencváros; X = Kőbánya; XI = Kelenföld; XII = Hill area; XIII = Angyalföld; XIV = Zugló; XV = Rákospalota; XVI = Mátyásföld; XVII = Rákoskeresztúr; XVIII = Pestlőrinc; XIX = Kispest; XX = Pesterzsébet; XXI = Csepel; XXII = Budafok, Lágymányos.

** Though "Láng Machine Works" and "April 4th Machine Works" have their own foundries, they do not provide for other plants contrary to factories in the first group.
It should also be mentioned that "Ikarus", "Orion" and the "Telephone Works" have no need of foundry products.

belong to the *third*, and at the same time *largest* group, which comprises more than 100 works.

The number of component manufacturers and assembly plants is relatively low which is related to the existence of the large number of heterogeneous companies, inherited from capitalist times. The development of component factories is uneconomic unless large-scale mass production is possible, which can only be guaranteed by many engineering works specializing in the assembly of one or at the most a few products. Within the engineering industry of the capital only the vehicle and electrical engine sectors have their own component plants. Component production has not hitherto grown up in relation to the instrument sector.

An interesting feature of the distribution of works belonging to the third group in Budapest is that a good many of the plants are in Angyalföld where components, armatures and hand-tools are manufactured by specialist small-scale plants which existed before 1945. Similar works are also to be found in Kőbánya.

In summary it may be stated that engineering is the most characteristic branch of manufacturing industry in Budapest, employing the largest number of workers and exporting the greatest number of products. In production profile it is labour intensive and demands the input of relatively little raw material. As regards business organization it is heterogeneous, although the notion that a modern engineering industry must coordinate the work of various plants for the manufacture of one or more products is being increasingly realized.

3. TEXTILE INDUSTRY

The textile industry is the second largest sector of the manufacturing industry of Budapest, following the engineering industry in terms of workers, production value and concentration. In 1969, 49 per cent of total production and 43·5 per cent of all employees were concentrated in Budapest (Fig. 4). The respective values for 1962 were 60 and 52·1 per cent.

Contrary to other sectors, the textile industry expanded considerably in Budapest between the two World Wars and within twenty years had become one of its leading manufactures. Thus in 1938, about 20 per cent of all industrial workers in the capital were employed in the textile mills.

Partly as a result of its rapid expansion, the textile industry came to lack many of the necessary ancillary sectors, for instance, textile machinery, and dye-producing chemical plants. Thus prior to the Second World War considerable quantities of semi-finished textile products such as mainly cotton yarn had to be imported. In addition, while many weaving mills and finishing plants were established, relatively few spinning mills were built.

The development of the textile industry during the inter-war period was boosted by government support and protective tariff. Thus government backed loans were granted to prospective textile manufacturers for the purchase from abroad of raw materials, semi-finished products, and textile machinery and equipment.

Its growth was also stimulated by an influx of Czech and Austrian capital and dismantled textile machinery as the textile industry in those countries struggled to overcome the difficulties imposed by the dismemberment of the Austro-Hungarian Monarchy.

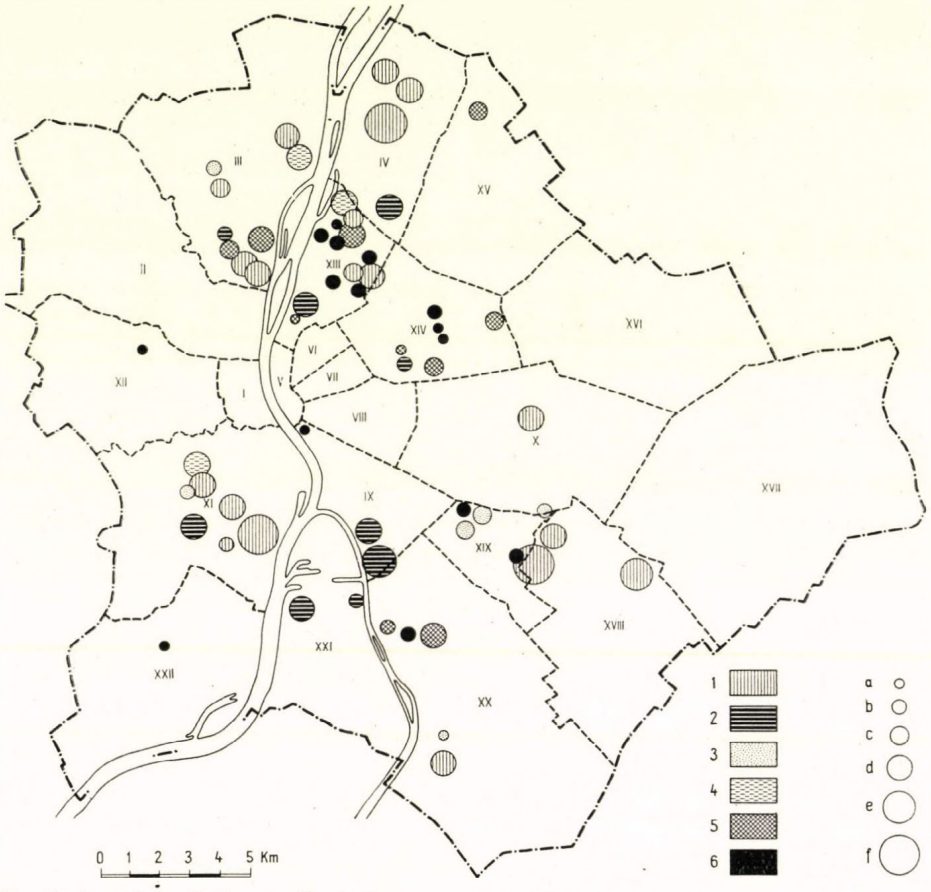


Fig. 4. Location of the textile industry
1 = cotton industry; 2 = wool industry; 3 = silk industry; 4 = flax, hemp and jute industry; 5 = haberdashery; 6 = hosiery
a = below 100; b = 100–300; c = 300–500; d = 500–1000; e = 1000–2000; f = 2000–4000 workers

The concentration of the Hungarian textile industry in Budapest was a natural response to the abundance of cheap female labour. Additionally, immediately after the First World War the precarious situation of the large number of ex-servicemen, refugees and other displaced persons in Budapest provided good changes for recruitment. The capital also offered excellent communication and transport facilities for the import of raw material from ports of Hamburg and Bremerhaven and the export and delivery of finished

products while the existence of a good water supply cannot be ignored. Finally, after 1918, the possibility of using premises left vacant by the food industry and armaments factories likewise promoted the establishment of the textile industry in Budapest. Considerable expansion also occurred in the immediate vicinity of the capital at Vác, Budakalász and Pomáz.

The interwar distribution still characterizes the Hungarian textile industry (Tables X and XI). Concerning the various sectors the following points can be emphasized:

(1) The share of Budapest is particularly high in the cotton industry employing more than 50 per cent of the total work force in this sector.

TABLE X

The significance of Budapest in the employment structure of the textile industry of Hungary

Branches of the textile industry	Thousands of workers						Share of Budapest (per cent)		
	Hungary			Budapest					
	1962	1967	1969	1962	1967	1969	1962	1967	1969
Cotton industry	58·6	63·6	63·2	35·9	36·0	33·4	61·3	56·6	52·8
Wool industry	24·3	27·9	28·5	12·8	13·1	12·1	52·7	46·9	42·5
Silk industry	6·1	6·4	7·2	2·8	2·8	3·0	45·9	43·7	41·6
Flax, hemp and jute industry	14·1	15·0	14·0	4·2	4·0	3·4	29·8	26·5	24·3
Fibre processing industry	5·3	6·1	6·2	—	—	—	—	—	—
Haberdashery	15·6	21·3	23·5	7·8	8·1	8·2	50·0	38·0	34·9
Hosiery	4·0	4·8	4·9	3·2	3·9	4·0	80·0	81·2	81·6
Total	128·0	145·1	147·5	66·7	67·9	64·1	52·1	46·8	43·5
Index (1962 = 100)	100	114	115	100	102	96	100	90	84

TABLE XI

Structure of the textile industry (in per cent)

Branches of the textile industry	Hungary			Budapest		
	1962	1967	1969	1962	1967	1969
Cotton industry	45·8	43·8	42·8	53·8	53·0	52·1
Wool industry	19·0	19·2	19·3	19·2	19·3	18·9
Silk industry	4·8	4·4	4·9	4·2	4·1	4·7
Flax, hemp and jute industry	11·0	10·3	9·5	6·3	5·9	5·3
Fibre processing industry	4·1	4·3	4·2	—	—	—
Haberdashery	12·2	14·7	15·9	11·7	11·9	12·8
Hosiery	3·1	3·3	3·4	4·8	5·8	6·2
Total	100·0	100·0	100·0	100·0	100·0	100·0

(2) Similarly Budapest is strongly represented in the knit-ware industry in which strong interconnections exist with the cotton and wool mills of the capital.

(3) In the flax and hemp industry the share of Budapest is relatively low.

That Budapest plays an outstanding role in the Hungarian textile industry is also witnessed by the fact that the largest, most specialized, mechanized and automated factories are located in the capital which from the point of view of cooperation provides them with a number of advantages over provincial mills. Finally, Budapest acts not only as the largest consumer market in the country but also as the export centre for textile products. This explains why its share in the finishing of cotton, silk and knit-ware is generally higher than the average concentration. Thus, in the cotton industry, 77 per cent of finishing capacity is located in Budapest. The only silk-cloth finishing plant in the country is also in the capital. Most finished wool-cloth produced is similarly derived from plants in the capital, not to mention hosiery and haberdashery.

Yet the opposite also holds true. The share of the capital in yarn production is lower than average for the textile industry as a whole. This arrangement, i.e. high concentration of the finishing and weaving capacity in Budapest associated with a relatively low yarn production, is the reason why large quantities of grey cotton fabric have to be brought to the capital for further processing from Sopron, Szombathely, Békéscsaba and to a smaller extent from Győr. Wool yarn is brought in from Sopron and from Kistarcsa, a suburb of Budapest.

After 1945, attention was concentrated on the cotton industry, most specifically on cotton-spinning. During the fulfilment of the first three-year and first five-year plans the largest investments in the textile sector and indeed in the whole of light industry were put into cotton mills. The majority of these new mills were established in the provinces at Kaposvár, Szeged and Miskolc; in Budapest, only the "Spinning Mill of Lőrinc" dates from this period, although it does manufacture approximately one-fifth of total Hungarian cotton-yarn production.

The textile firms in Budapest are not evenly distributed. Small-scale mills still exist in some districts, while large-scale plants, of which there are 54, prevail in others. Thus, for instance, 13 textile mills are in operation in Angyalföld, each of which has about 400 workers, while in Óbuda there are 9 textile mills with about 800 workers. On the other hand, in Újpest textile mills number only 4, but employ on average more than 2000, while in the 7 textile mills in Kelenföld the number of workers averages about 1000.

In terms of size and cooperation in production three textile zones may be distinguished.

In the northern zone comprising the city districts of Újpest, Óbuda and Angyalföld are employed about 40 per cent of all textile workers in the capital, although the proportions are even higher in the flax and hemp (75 per cent) and knit-ware industries (45 per cent). In Újpest over 80 per cent of textile workers find jobs in the cotton mills, which contrasts with Angyalföld where the flax and hemp industries occupy first place. The cotton industry is also to the fore in Óbuda though here the knit-ware industry is substantial as well.

The textile mills in Kelenföld and Ferencváros, in which the cotton and the wool industries prevail, belong to the southern zone. The largest industrial cotton plant in the country is in Kelenföld, but due to a shortage of finishing capacity considerable quantities of raw fabric are sent to Óbuda.

The mills of Kőbánya, Pestlőrinc and Soroksár comprise the south-eastern zone. The cotton industry prevails also here, employing 92 per cent of textile industrial workers. Other branches are represented in the zone by one or two smaller mills only. The largest cotton spinning mill of the country, the "Lőrinci Fonó" as well as the "Textile Works of Kőbánya", and "Kistext", the three of which concentrate about one-third of the cotton spinning capacity in the country, are located in this zone. One-quarter of the cotton looms operated this zone by the weaving mills of the Kőbánya, Kispest and Soroksár Textile Works. Finishing capacity by contrast is relatively small, and the unbalanced character thus created is compensated for by widespread cooperation.

In addition to the above concentration zones must also be mentioned Zugló in which the leading textile branches are knit-ware and small-ware. The largest knit-ware dye work is located here.

In future one may confidently expect the proportion of the Hungarian textile industry in the capital to gradually decrease. From an economic-geographic point of view it is apparent that the textile industry in Budapest has now lost those advantages deriving from its geographical position when most of the raw materials used were imported from western countries. Likewise the reserve of cheap labour has long disappeared. To balance these rather unfavourable developments Budapest has retained the benefits to be drawn from inter-factory production-cooperation.

At present between 85 and 90 per cent of raw cotton, and considerable quantities of wool and silk are imported from countries situated east of Hungary, particularly from the Soviet Union. As such centres in the eastern half of the country are now from the transport point of view in the most advantageous position. At the same time, the existence of female labour released from agriculture makes it reasonable to locate new textile mills and to enlarge older establishments in the provinces. Such a policy accords with the planned industrialization of the Great Plain, which from the industrial point of view still lags behind the other regions of Hungary.

4. CHEMICAL INDUSTRY

In pre-war Hungary Budapest was the most prominent base of the chemical industry, although a few large chemical plants also existed in the provinces at Pét, Peremarton, Fűzfő and Pápa. This was due primarily to the relative poverty of the country in chemical raw materials which thus had to be imported and to the existence of foreign monopolies. It was therefore not accidental that pharmaceutical production, requiring not so much raw material as qualified researchers and skilled workers, developed into the leading sector within the chemical industry. The pharmaceutical plants of Budapest were also largely dependent on foreign capital. Nevertheless, Hungarian pharmaceuti-

cal products did not reign supreme on the home market, having to counteract keen competition from German and Swiss firms.

It is well known that until 1945 German monopolies played a leading role in the countries of Central and South-Eastern Europe which accounted for the relative backwardness of the chemical industries of these countries.

Fig. 5. Location of the chemical industry
1 = pharmaceutical industry; 2 = production of inorganic chemical products; 3 = rubber industry and synthetic materials; 4 = production of organic chemical products; 5 = crude oil processing industry
a = 100–300; b = 300–500; c = 500–1000; d = 1000–2000; e = 2000–3000 workers

Competition was most obvious in the manufacture of lacquers, paints and dyes, the whole of Central and South-Eastern European market being controlled by I. G. Farbenindustrie.

The situation was only slightly more favourable in other branches of the Hungarian chemical industry. Even the relatively well developed sectors

such as the pharmaceutical industry* were engaged in processing foreign, above all German semi-finished products and basic materials, while the use of local raw materials such as brown coal, crude-oil and natural gas was on a low scale. The activity of such a relatively well developed branch as the pharmaceutical industry was further restricted to the production of the simplest products and the packing of basic pharmaceutical materials imported from abroad. In a word, the Hungarian pharmaceutical industry practically became an "affiliated branch" of the German chemical industry.

The present structure of the chemical industry of Budapest is more balanced and better corresponds to the requirements of the country and the interests of foreign trade than the pre-war structure (Tables XII and XIII). Freed from German competition, the organic chemical industry created after 1945 and manufacturing lacquers, and dyes, began to expand rapidly. The manufacture of chemical fertilizers also existed in Hungary before the war but production was for export only. After 1945 it was given new bases in the eastern half of the country at Kazincbarcika and Tiszapalkonya, with the purpose of satisfying the increasing demands of Hungarian agriculture. The pharmaceutical industry expanded into the leading branch of the chemical industry in the capital, its production deriving almost entirely from the processing of domestic basic materials (Fig. 5).

TABLE XII

The significance of Budapest in the employment structure of the chemical industry of Hungary

Branches of the chemical industry	Thousands of workers						Share of Budapest (per cent)		
	Hungary			Budapest					
	1962	1967	1969	1962	1967	1969	1962	1967	1969
Organic and inorganic chemical products	21·6	30·8	38·9	7·1	8·6	8·1	32·9	27·9	20·8
Crude oil processing industry	4·0	5·3	6·4	1·0	0·9	0·6	25·0	17·0	9·4
Municipal gas production	5·1	8·2	10·7	3·7	3·2	3·0	72·6	39·0	28·0
Coal processing industry	2·9	1·8	1·6	0·6	0·6	0·4	20·7	33·3	25·0
Pharmaceutical industry	15·7	18·0	19·7	12·8	14·8	15·8	81·5	82·2	80·2
Dye-stuffs industry	1·6	1·6	1·6	1·1	1·3	1·4	68·8	81·3	87·5
Production of household chemicals and cosmetics	2·0	2·0	2·0	1·6	2·0	2·0	80·0	100·0	100·0
Rubber industry and synthetic materials	12·5	17·9	20·8	10·1	16·7	15·4	80·8	93·3	74·0
Total	65·4	85·6	101·7	38·0	48·1	46·7	58·1	56·2	45·9
Index (1962 = 100)	100	134	156	100	126	123	100	97	79

* Prior to the Second World War Hungary ranked sixth in the world export of pharmaceutical products.

TABLE XIII

Structure of the chemical industry (in per cent)

Branches of the chemical industry	Hungary			Budapest		
	1962	1967	1969	1962	1967	1969
Organic and inorganic chemical products	32·1	36·0	38·2	18·7	17·9	17·3
Crude oil processing industry	6·1	6·2	6·3	2·6	1·9	1·3
Municipal gas production	7·8	9·6	10·5	9·7	6·6	6·4
Coal processing industry	4·4	2·1	1·6	1·6	1·2	0·9
Pharmaceutical industry	24·1	21·0	19·4	33·7	30·8	33·8
Dye-stuffs industry	2·4	1·9	1·6	2·9	2·7	3·0
Production of household chemicals and cosmetics	3·1	2·3	1·9	4·2	4·1	4·3
Rubber industry and synthetic materials	19·0	20·9	20·5	26·6	34·8	33·0
Total	100·0	100·0	100·0	100·0	100·0	100·0

Several light industrial plants within the general framework of the chemical industry were established in Budapest to satisfy the direct demands of the population. These excluded the manufacture of pharmaceuticals, photographic materials and household and cosmetic products, which typically are associated with capital cities.

At the same time the heavy chemical industry also plays an important role in Budapest, in contrast to other capitals, utilizing basic materials and manufacturing finished products, which are of relatively high volume and difficult to transport. In comparison with the light chemical industry the fertilizers, pesticides and sulphuric acid, etc. produced by the heavy chemical sector are consumed almost exclusively outside the capital.

The main causes of the exceptionally strong concentration of the chemical industry in Budapest are as follows:

(1) In the period when chemical plants were being established in Hungary, Budapest provided the most considerable consumer market for its products.

(2) The presence of highly qualified experts and technicians in the capital.

(3) Budapest as the most important railway warehouse centre became, prior to the First World War, responsible for the distribution of imported basic materials for the chemical industry.

(4) The situation of Budapest on the banks of the Danube was a strong attractive force because of the chemical industry's need for water.

In Budapest 26 chemical factories employing 38,000 workers were in operation in 1962 (in 1969 almost 47,000).

Table XIII clearly shows that one-third of the workers in the chemical industry in the capital are employed in the pharmaceutical sector and exactly one-third in the rubber factories. Of the other sectors, that producing inorganic chemicals was one of the earliest branches to be developed, i.e. at the end of the 19th century, but it was only after 1945 that the organic chemical

industry started to expand vigorously. The textile industry is the main consumer of products from this branch.

The following presents a short survey of the three most important branches of the chemical industry along with new problems.

Pharmaceutical production is the best developed branch and most successful export sector, up to 50 per cent of its products being sent abroad every year. Both socialist and capitalist countries provide stable markets of all the sectors within the chemical industry, it is only in the pharmaceutic branch that the value of exports exceeds the cost of imported raw materials.

At present 7 pharmaceutical factories are operating in Hungary, four being located in Budapest and three in Counties Hajdú and Szabolcs-Szatmár.* Yet the plants in Budapest employ more than 80 per cent of the workers engaged in the pharmaceutical industry. The three largest factories are all located in Budapest they being the "Pharmaceutical Works of Kőbánya" (earlier "Richter"), the "United Pharmaceutical and Food Preparations" ("Wander") and "Chinoin". These three manufacture four-fifths of total drug output.

On average between 42 to 46 per cent of the products of the Kőbánya Works and of Chinoin are exported, the relevant figure for the pharmaceutic industry as a whole being 35 per cent. In all the factories in Budapest supply 95 to 96 per cent of total exports and supply 80 per cent of the home market.

One of the major problems facing the further expansion of the pharmaceutical industry concerns packaging which, if attractive, facilitates business in foreign markets. Before 1945 many pharmaceutical plants had their own printing presses and box and ampoule producing workshops. By the 1950's, however, most of these had been closed down, and the packaging branch turned over to the glass and paper industries, but since orders from the pharmaceutical industry comprised a relatively small item little attention was paid to the production of attractive packaging, to the detriment of export possibilities. Since 1958 the pharmaceutical industry has come forward with a number of excellent products which have found a ready sale on world market. In consequence, the level of packaging has had to be raised.

Before 1945 the pharmaceutical companies had no definite production-scales, with the same drug sometimes being manufactured by several factories under different names. Specialization was thus introduced immediately after nationalization, with the "Chinoin" and "United Medicine and Food Preparations" companies concentrating on synthetic drugs, and "Kőbánya Pharmaceutical Works" on the production of drugs from vegetable raw materials. "Chinoin" has also contracted to manufacture antibiotics.

Within the pharmaceutical industry research work into the preparation of new products and technological improvement is of great importance. Thus the product stock has been virtually renewed during the last ten years, as the prompt appearance of a new drug on the world market ensures the maximum result from the point of view of foreign trade, when its price may be many times its production cost. Investment in the pharmaceutical industry

* The two pharmaceutical factories in Debrecen (County Hajdú) were amalgamated in 1963.

can therefore be very quickly recovered, i.e. in 1–2 years on average. It need not be stressed that as a foreign currency earner the pharmaceutical industry holds an extremely important position in the national economy.

Development in the pharmaceutical industry depends on the following:

(1) This is a traditional Hungarian industry. Therefore, there exists a highly qualified and experienced staff.

(2) Relatively low investment costs and a good capital return.

(3) Part of the basic materials for production can be derived from internal resources.

(4) The socialist countries represent a stable market, while hard currency can be earned from capitalist countries.

In summary, further development of the pharmaceutical industry accords with the economic situation in Hungary, i.e. lack of raw materials, rapid return of capital investment and high labour requirements. As the pharmaceutical factories in Budapest have valuable fixed assets, and a staff of experts and scientists at their disposal, enlargement and development within the capital appear justified.

The rubber industry. A considerable number of plants are located in Budapest, most being established before 1945, when no rational policy concerning the geographical situation of labour existed. Under the influence of increased demand for rubber products after 1945, the factories in Budapest were enlarged, and the pre-war situation thus consolidated. These factories now employ four-fifths of all the workers in the rubber industry.

Plants associated with the "Rubber-Ware Company" were established 60 years ago and until 1922 produced a wide variety of rubber goods. Due to the rise of the motorcar and the establishment of new rubber factories, the "Rubber-Ware Company" began increasingly to specialize in the manufacture of tyres and rubber hosing. A stable production scale did not exist before 1945, but the subsequent growth of the Hungarian vehicle industry led to a rapid expansion in demand for products manufactured by the "Rubber Ware Company". One of the main factors preventing mass production of tyres at present is the mixed nature of the domestic car-stock, involving the manufacture of about 50 different types of tyres and hoses. The vehicle industry in Hungary alone requires about 15 different types of tyres. The most important partners of the "Rubber-Ware Company" are the "Csepel Car Works", "Ikarus", the "Red Star Tractor Works", and the "Csepel Iron and Metal Works".

A second production problem of the "Rubber-Ware Company" is that its equipment is mainly pre-war, suitable only for the processing of natural rubber. In the early 1950's when the Western Powers pursued a policy of trade discrimination against the socialist countries, the proportion of synthetic rubber used as a basic material rose above 40 per cent, leading to a considerable deterioration in quality. The ratio of natural caoutchouc rose in the last years, while synthetic caoutchouc to 20–30 per cent was worked up with newly bought up-to-date equipment.

A third problem that the company faces is connected with the limited possibilities for plant expansion, past increases in production have been derived entirely from raising labour productivity. The present situation, however,

urgently demands the establishment of a new rubber plant, especially since more than half of the output of the Hungarian rubber industry is supplied by the "Rubber-Ware Company".

The inorganic chemical industry. In this sector of the industry in Budapest two chemical factories established before the war dominate which, in 1963 were to form the "Chemical Company of Budapest". The sulphuric acid plant produces 40 per cent of the country's total output and 60 per cent of the superphosphate. Another plant produces chlorine and caustic soda through the electrolysis of common salt. It also manufactures hydrochloric acid and germicides.

One of the reasons for locating this plant in the capital was obviously the demand of other industries for large quantities of its products such as sulphuric and hydrochloric acid, and chlorine which are difficult to transport. These products as well as caustic soda are also utilized by the pharmaceutical sector and by other branches of the light chemical industry.

Conclusions. (1) The chemical industry of Budapest is of primary importance for the Hungarian national economy as it supplies substitutes for several raw materials lacking internally.

(2) Of the many branches of the chemical industry only the pharmaceutical sector produces for export on a large scale (approximately 50 per cent of the products of which are sent abroad). The other branches satisfy mainly internal demand.

(3) The marketing of the finished products of the chemical industry is relatively well defined: fertilizers and pesticides and insecticides are supplied to agriculture, the rubber factories cooperate with the vehicle and tractor works of the capital, while the textile finishing plants concentrated at Óbuda are the largest consumers of dye. The majority of the finished products of the Budapest chemical works are utilized locally.

(4) In the years immediately after 1945, particularly during the period of the first five-year plan, the consolidation of the chemical industry outside Budapest was begun, and new and important plants were established in the provinces, at Szolnok, Kazincbarcika and Tiszapalkonya. Nevertheless the share of Budapest is still high, although plans up to 1980 predict a further reduction in its relative significance in the industry. The transfer of the heavy chemical industry from Budapest is being implemented and within this scheme a new technical rubber factory has already been established at Szeged and two smaller rubber plants located at Vác and Nyíregyháza.

5. FOOD INDUSTRY

The significance of this branch in the manufacturing industry of Budapest is considerable, it employing approximately 6 per cent of the total number of industrial workers in the capital. Compared with the figures for 1938, a relative reduction in its importance has been planned, although the number of workers it employs has nearly doubled since that time.

Budapest is the most important food processing centre in the country. Thus, as with other industrial branches, more than half the total output

is produced by the processing plants in the capital, for instance, vegetable oil, confectionery, meal, beer and meat-packing, despite the fact that neither Budapest nor the immediate vicinity has a sufficient supply of basic produce for the maintenance of these industrial branches (Tables XIV and XV).

With the exception of paprika processing, all branches of the Hungarian food industry are represented in Budapest. While its main rationale is the supply of the local population in the brewery, confectionery, tobacco, distilling and to some extent the meat sectors are of national importance.

The central position of the capital, its radial road and rail network, its relative closeness to the most important agricultural areas as well as the concentration of consumer demand, have all contributed to the development of Budapest as the most important centre of the food industry (Fig 6).

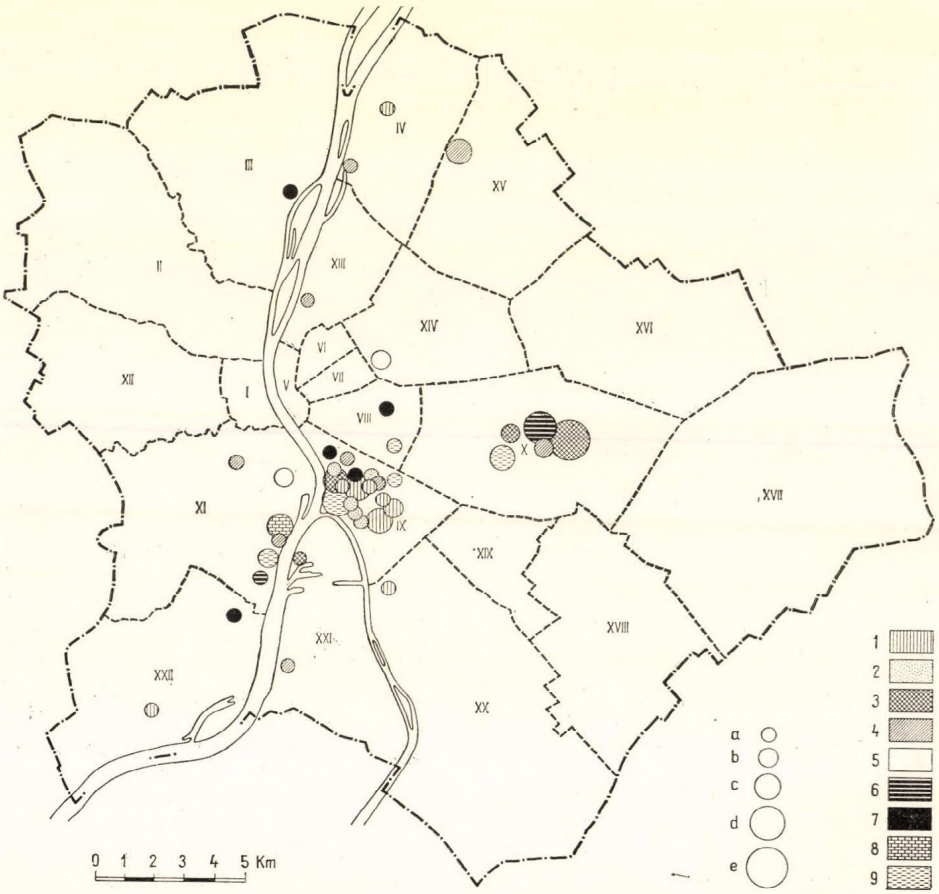


Fig. 6. Location of food industry
1 = meat industry; 2 = milling industry; 3 = canning industry; 4 = vegetable oil industry; 5 = dairy industry; 6 = beer industry; 7 = distilling and starch industry; 8 = tobacco industry; 9 = confectionery industry
a = 100–300; b = 300–500; c = 500–1000; d = 1000–2000; e = 2000–3000 workers

Table XIV

The importance of Budapest in the employment structure of the food industry of Hungary

Branches of the food industry	Thousands of workers						Share of Budapest (per cent)		
	Hungary			Budapest					
	1962	1967	1969	1962	1967	1969	1962	1967	1969
Milling industry	9·7	16·6	19·4	1·2	1·0	1·0	12·4	6·0	5·2
Baking and pastry industry	18·4	24·1	24·1	4·1	5·4	5·9	22·3	22·4	24·5
Meat industry	12·1	14·0	22·1	4·8	4·9	6·0	39·7	35·0	27·1
Poultry and egg processing	4·8	7·8	8·4	0·4	1·1	1·2	8·3	14·1	14·3
Dairy industry	6·5	11·5	12·0	2·0	2·2	2·5	30·1	19·1	20·8
Sugar industry	8·2	12·2	12·1	—	0·2	0·2	—	1·6	1·7
Confectionery industry	8·1	12·1	9·3	5·2	5·1	5·7	64·2	42·1	61·3
Vegetable oil industry	2·6	4·1	2·5	2·0	1·9	1·9	76·9	46·3	76·0
Canning industry	19·6	30·5	35·2	4·9	4·9	4·6	25·0	16·1	13·1
Paprika processing	2·3	3·0		—	—		—	—	
Distilling and starch industry	4·5	7·5	6·0	2·1	2·6	2·9	46·7	34·7	48·3
Beer industry	5·5	6·1	6·7	3·4	3·9	4·0	61·8	64·0	59·7
Processing of mineral and sodawater and soft drinks	8·8	5·3	3·1	1·3	1·1	1·1	34·2	20·8	35·5
Tobacco industry	5·5	6·2	6·7	1·0	0·5	0·6	18·2	8·1	9·0
Total	116·6	161·0	167·6	32·4	34·8	37·6	29·0	23·9	22·4
Index (1962 = 100)	100	144	150	100	107	116	100	82	77

Table XV

Structure of the food industry (in per cent)

Branches of the food industry	Hungary			Budapest		
	1962	1967	1969	1962	1967	1969
Milling industry	8·7	10·3	11·6	3·7	2·9	2·7
Baking and pastry industry	16·6	15·0	14·4	12·6	15·5	15·7
Meat industry	10·9	8·7	13·2	14·8	14·1	16·0
Poultry and egg processing	4·3	4·8	5·0	1·2	3·1	3·2
Dairy industry	5·8	7·1	7·2	6·2	6·3	6·6
Sugar industry	7·3	7·6	7·2	—	0·6	0·5
Confectionery industry	7·3	7·5	5·5	16·1	14·7	15·2
Vegetable oil industry	2·2	2·5	1·5	6·2	5·5	5·1
Canning industry	17·6	18·9	21·0	15·1	14·1	12·1
Paprika processing	2·1	1·9		—	—	
Distilling and starch industry	4·0	4·7	3·6	6·5	7·5	7·7
Beer industry	4·9	3·8	4·0	10·5	11·2	10·6
Processing of mineral and sodawater and soft drinks	3·4	3·3	1·8	4·0	3·1	2·9
Tobacco industry	4·9	3·9	4·0	3·1	1·4	1·6
Total	100·0	100·0	100·0	100·0	100·0	100·0

The food industry of Budapest is characterized by the overexpansion of a number of typically "non city" branches such as vegetable oil processing and canning and the presence of only a few sectors oriented towards the consumer market such as breweries and meal production. Production of the latter branches is generally far in excess of the requirements of the population of the capital. Domestic produce is utilized almost exclusively by the food industry of the capital.

The food industry in Budapest is highly concentrated. Ferencváros and Kőbánya are leading districts, where the food industry employs one-third and one-sixth respectively of all industrial workers. Over half the occupied in the food industry in the capital work in these two districts. Besides satisfying the requirements of the population of Budapest the factories in these two districts produce, for instance, beer, chocolate, canned goods and liqueurs for the national market, and meat products, canned goods and beverages for export. Although the significance of agricultural products in the total exports of the country has decreased considerably since 1945 the proportion of exports derived from manufactured agricultural products has increased. The destination of exports has similarly changed. While prior to 1945 Germany, Austria, Switzerland and Great Britain provided the main markets, at present the German Democratic Republic, Czechoslovakia and the Soviet Union are the most important partners of Hungary's food industry.

The evolution of the food industry in Budapest has changed over time. At the turn of the present century, it was the most developed industrial branch within the Hungarian capital, but since then its role has been increasingly restricted to the supply of the needs of the population of the capital.

The *flour industry* is the oldest and was in the past the most developed branch of the food and indeed of the whole of manufacturing industry within both Budapest and of Hungary. The reasons for this have already been discussed in the introductory chapter. Prior to the First World War, about two-thirds of the commercial mills were located in Budapest, producing approximately 65 per cent of flour output. Steam-mills could be found in almost every district of the city bordering on the Danube, those in Ferencváros, Óbuda and Angyalföld being the most important. An interesting relationship rapidly grew up between the steam-mills and the development of the railway network. In the last thirty years of the last century the railway lines radiating from Budapest were directed in the first place to the grain producing regions of the Great Plain. Steam flour-mills gradually ousted the old water mills and the railways took over the role of water transport in the delivery of wheat. A considerable part of the flour export trade continued to be carried out by boat, however, as a result of these interacting factors the steam-mills were located along the river at the rail freight terminals. Budapest being the most important rail depot in the country attracted 11 out of the 14 largest steam-mills established in Hungary.

After the First World War the milling industry of Budapest lost its markets and only about one-fourth of the existing capacity could be used. Several mills in Budapest were thus dismantled while others were transformed into food processing factories for instance for rice milling.

The once world famous 11 commercial steam-mills of the capital were

gradually closed down, and at present only one is working. Compared with the 600,000 tons of wheat milled annually in the early years of this century, at present output is down to 100,000 tons which is not even sufficient for the requirements of Budapest. Now only 5 per cent of the flour requirements of the country are produced by mills in Budapest.

The *canning industry* is a branch which is generally established near to its raw-produce base. Owing to historical factors, however, more than one-third of the workers in the canning industry in Hungary were employed in Budapest and during the inter-war period.

This branch assumed the dimensions of a large-scale industry. One of the main stimulants for the establishment of canning plants in Budapest was, in addition to cheap manpower, a surplus of fruit and vegetables in the markets of the capital. Although prices were generally higher there than in the provincial markets, a surplus was created and the owners of the local canning factories were able to buy up perishable goods at relatively low prices. As local supplies and deliveries were unstable the canning factories manufactured a wide variety of products. As a result they tinned from time to time not only vegetables but also meat, pastry, maccaroni and other preparations made from flour.

After nationalization, although a policy of rationalization was implemented, the production schedule of the Budapest canning plants is still most varied. Thus, the bulk of the fruit and vegetables processed arrive even now from within a radius of 60 to 70 km of the plants from neighbouring County Pest. Although this part of the Danube–Tisza Midregion is one of the most important fruit and vegetable producing area of Hungary, large fluctuations in output are still evident which adversely affect the canning factories of the capital. For this reason the area of raw produce supply must be widened.

The location of large canning plants in the capital is unfortunate, because perishable produce has to be transported over relatively long distances, while the processing itself is of a seasonal character. The recruiting of manpower in adequate numbers for the undermechanized plants is moreover not an easy task.

On the other hand the canning industry is one of the most successful exporters in the capital, the "Canning Works of Budapest" sending 15 to 20 per cent of its output to the GDR.

Brewing in Budapest expanded considerably during the 19th century, the lime-stone caves of Kőbánya and Budafok, which served as storage cellars, playing an important causal role. The breweries in Budapest supplied between 80 and 90 per cent of the beer produced in the country prior to the Second World War, the most significant locating factor being the regular consumption of over 60 per cent of total output in the capital. In the provinces, beer could not compete with the traditional and relatively cheaper wine.

The cheap price of beer and the comparative costliness of wine have also contributed to the development of the malt industry since 1945. While annual consumption of beer per capita before the war amounted to about 2·5 litre per year, by the end of the 1950s this value had jumped to over 30 litres. Expansion in demand was particularly sudden in the provinces, where now approximately 60 per cent of beer is consumed. The breweries at Kőbánya

have, however, continued to supply between 85 and 90 per cent of the country's beer requirement. Breweries at Sopron, Nagykanizsa and Pécs supply a relatively small region. Since about two-thirds of the country are provided with beer from the breweries in Budapest, the average transport distance is great and hardly profitable. With the expected increase in beer consumption the construction of a new brewery has become necessary, which according to plan will be built at Miskolc in County Borsod and should relieve somewhat the pressure on the breweries at Kőbánya enabling them to produce high quality bottled beers for export.

The Kőbánya breweries obtain their malting barley entirely from inland sources—from County Győr-Sopron and Mátra region. 80 per cent of the hops used for brewing, however, are imported from Czechoslovakia, although the climate and soil conditions of Hungary are well suited to their cultivation. Increasingly, however, the brewing industry will be supplied with home-grown hops although for reasons of quality, limited imports of hop will have to be maintained. Considerable quantities of malt are being exported from the breweries of Kőbánya to neighbouring Austria, although owing to the increase in internal consumption in ever diminishing quantities.

IV. SPATIAL STRUCTURE

All the important industrial districts of Budapest with the exception of Kőbánya form an axis alongside the Danube, on either side of which the city and industry expanded. Indeed the distribution of factories has changed little in the last 70 years. We may discuss the extension and significance of the old industrial districts in the capital, but we cannot say that entirely new and independent industrial zones have come into existence.

Even the South-Buda zone, the most recent industrial district in Budapest, can be regarded as a more modern variation and extension of the old industrial zone of Budafok. The electricity generating station at Kelenföld, put into operation directly before the First World War, "attracted" those newly established industrial plants which utilized large quantities of steam, industrial hot water and electric energy.

The concentration of industrial plants in Budapest has developed in two ways, firstly the presence of one plant inducing the location of another nearby and secondly the existence of some natural or economic factor, such as the Danube, the railway network, water pipe-lines, sewers, unoccupied sites and open spaces. Between such plants no productive connection at all need have existed. The latter form was more typical of industrial location in Budapest during the capitalist period and was largely responsible for the growth of industry in Kőbánya and Budafok.

The spontaneous development of industry under capitalism induced cooperation, and the exchange of semi-finished products between factories located in the various districts of the capital. Thus, for instance, the important slaughter-houses were placed in the southern part of the city in Ferencváros while tanneries were located in Újpest in the north. The existing disproportions between the weaving mills and finishing plants of the Budapest cotton industry not only existed between individual plants but also between individual districts. This in turn increased inter-city traffic and also increased the cost of finished products.

From the middle of the last century industrial plants within Budapest were established along three transport routes:

(1) In the north along Váci Street manufacturing industry began to develop in the zone between the Danube and the Budapest–Vác railway line, the oldest in Hungary.

(2) In the south-east, along the Budapest–Cegléd and Budapest–Hatvan railway lines.

(3) In Ferencváros in the south along the Danube and the Budapest–Subotica railway line.

TABLE XVI

The employment structure by branches of manufacturing industry in the districts

District	Primary metal (1)	Fabricated products (2)	General machinery (a)	Heavy electrical industry and machine building (b)	Light electrical industry (telecommunications and vacuum) (c)	Precision engineering and instruments (d)	Industrial metalware (e)	Other metalware (f)
1.	—	—	—	—	—	—	—	—
2.	4·4	94·2	—	100	—	—	—	—
3.	—	34·5	69·8	—	11·2	15·1	3·9	—
4.	0·3	43·5	14·7	2·1	55·9	3·2	2·3	—
5.	—	17·3	0·6	—	—	99·4	—	—
6.	—	48·9	—	71·3	14·6	13·9	—	0·2
7.	0·3	9·3	43·1	8·8	—	32·7	—	15·4
8.	—	63·5	87·5	—	—	4·1	1·6	6·4
9.	0·3	20·9	59·0	—	—	13·9	14·9	10·9
10.	2·0	47·7	21·0	28·6	15·0	0·4	2·8	19·6
11.	0·2	47·8	48·3	24·9	23·6	0·0	2·4	0·4
12.	—	—	—	—	—	—	—	—
13.	1·5	67·6	50·0	10·6	1·6	2·3	8·3	13·8
14.	—	55·6	13·6	—	34·5	3·0	3·6	32·7
15.	—	17·0	9·2	—	—	—	0·8	—
16.	0·2	99·7	76·2	—	—	14·3	4·7	4·8
17.	—	—	—	—	—	—	—	—
18.	6·0	9·3	100·0	—	—	—	—	—
19.	—	54·4	82·2	0·2	—	17·6	—	—
20.	1·8	25·0	42·2	17·7	—	18·2	—	16·2
21.	41·0	36·8	98·3	—	—	—	—	—
22.	13·7	19·4	—	—	6·1	—	—	93·9

The younger industrial micro-district at the northern end of Csepel-Island developed along the banks of the Danube in the 20th century, as a direct result of the exceptionally favourable communications of the district. Otherwise this is the only district at some distance from the above railway lines which relies mainly on river transport.

The emergence of the northern, southern and south-eastern industrial zones determined the position of manufacturing industry in Pest. Other factors besides those already mentioned also played a role in each industrial zone, especially in the initial period of manufacturing industry. In the case of the Kőbánya industrial district clay suitable for production of high quality bricks was available, while underground cellars carved into limestone were suitable for beer storage. The eastern part of Kőbánya encouraged the emergence of those sectors of the chemical industry requiring little water such as pharmaceuticals, while those utilizing large quantities of water were established in the vicinity of the Danube in Ferencváros and Csepel.

Óbuda on the right-hand bank of the river became prominent rather early despite the restricted space for industrial expansion, mills and brickworks being founded there employing relatively few workers. The industrial district of

of Budapest, 1959

Repair of communication equipment (g)	Electrical generating (3)	Building materials (4)	Chemicals (5)	Wood and furniture (6)	Paper and printing (7)	Textiles (8)	Leather and shoes (9)	Food (10)	Total 1959	Total 1970 (in thousands)
—	—	—	—	—	100	—	—	—	100	5·2
—	—	—	—	—	—	—	—	1·4	100	11·4
—	—	15·5	—	2·3	—	46·3	—	1·4	100	25·4
21·8	0·8	—	7·3	4·2	0·5	28·1	14·3	1·1	100	52·1
—	8·0	—	—	—	67·5	4·8	—	2·4	100	24·9
—	—	—	—	—	50·8	—	—	0·3	100	17·4
—	—	16·8	—	5·9	50·1	6·0	—	11·6	100	24·6
0·4	—	—	10·3	2·5	4·0	15·3	2·1	2·3	100	44·6
1·3	—	0·8	10·2	7·2	—	22·8	—	37·8	100	39·5
12·6	—	10·5	9·7	2·1	—	11·8	1·2	15·0	100	74·1
0·4	2·9	3·3	1·2	0·5	—	34·1	—	10·0	100	52·1
—	—	—	—	—	—	—	—	—	—	7·8
13·4	7·8	2·2	0·1	3·7	1·1	15·4	0·0	0·6	100	76·4
12·6	—	6·6	4·7	5·7	1·9	14·3	8·2	3·0	100	31·8
—	—	—	3·5	8·0	—	25·8	20·9	24·8	100	10·3
—	—	0·1	—	—	—	—	—	—	100	11·1
—	—	—	100·0	—	—	—	—	—	100	2·3
—	—	4·1	—	—	—	80·5	—	0·1	100	12·2
—	—	9·2	—	—	—	34·3	—	2·1	100	12·7
5·7	—	2·9	2·3	—	5·1	55·1	—	7·8	100	15·0
1·2	5·1	0·2	1·5	—	4·4	7·5	1·8	1·7	100	38·8
—	—	—	—	15·4	11·0	11·6	—	11·0	100	12·7
										602·4

Kelenföld–Lágymányos–Budafok, close to the Danube, began to expand rapidly somewhat later, seeing its farthest development between the two world wars.

When examining the development of industrial districts in Budapest, the chain of industrial plants along the Danube and the railway lines respectively had not come close to the administrative boundaries of Budapest until the 1st January 1950, when industry started an exceptionally rapid development *outside* the capital boundaries but very close to them. Cheaper sites, rents and tax facilities had been mainly responsible.

Among the former suburbs and towns, Kispest, Pesterzsébet, Újpest, Budafok, Rákospalota and Pestszentlőrinc should be mentioned, some such as Újpest and Budafok, developing along the Danube, and others along the three main railway lines.*

In addition several workers' settlements were incorporated into the capital in 1950. Csepel was the most prominent, which although being the main centre of heavy industry, only had village status prior to that date.

* In January 1950 these suburbs were annexed to Budapest each forming a separate district within the capital.

TABLE XVII

The employment structure of manufacturing industry in Budapest by districts, in 1959

District	Primary metal	Fabricated products	General machinery	Heavy electrical industry and machine building	Light electrical industry (telecommunications and vacuum)	Precision engineering and instruments	Industrial metalware	Other metalware	Repair of communication equipment
1.	—	—	—	—	—	—	—	—	—
2.	1·1	2·4	—	20·1	—	—	—	—	—
3.	—	4·2	5·8	—	3·7	14·2	4·3	—	—
4.	0·7	10·2	3·0	1·8	44·7	7·3	6·1	—	28·2
5.	—	0·4	0·0	—	—	9·7	—	—	—
6.	—	0·9	—	5·2	1·0	2·8	—	0·0	—
7.	0·0	0·3	0·3	0·2	—	2·3	—	0·5	—
8.	—	11·5	20·3	—	—	10·4	5·0	7·8	0·6
9.	0·3	2·9	3·4	—	—	9·0	11·4	3·3	0·5
10.	5·7	14·5	6·2	34·1	17·1	0·9	11·1	29·9	24·6
11.	0·4	9·3	9·0	18·8	17·0	0·1	6·0	0·4	0·5
12.	—	—	—	—	—	—	—	—	—
13.	4·3	21·5	21·6	18·4	2·6	11·4	47·2	31·1	35·9
14.	—	4·8	1·3	—	13·6	3·3	4·5	16·4	7·7
15.	—	0·4	0·8	—	—	—	0·1	—	—
16.	0·0	3·4	5·2	—	—	11·0	4·3	1·7	—
17.	—	—	—	—	—	—	—	—	—
18.	3·8	0·6	1·3	—	—	—	—	—	—
19.	—	3·4	5·7	0·0	—	13·7	—	—	—
20.	0·6	0·9	0·8	1·4	—	3·9	—	1·6	0·7
21.	78·2	7·7	15·3	—	—	—	—	—	1·3
22.	4·8	0·7	—	—	0·3	—	—	7·3	—
	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

* Compiled by the author
** Based on the data of the Central Statistical Office

At the beginning of the century these settlements around Budapest were underdeveloped, the only exceptions being Újpest with its light industry, Budafok with its food industry and Csepel with the "Weiss Manfred Works". The development during the first years of the 10's in the 20th century imposed a decisively heavy industrial character on the industrial zones near Budapest. Thus by 1920 the North-Pest and South-Pest industrial regions comprised about 65 per cent heavy industry and some food processing. The South-Buda industrial region was similar as regards heavy industry, although here the food industry played a larger role than light industry.

The manufacturing industry of Budapest between the two world wars developed vigorously in the above-mentioned six suburbs and to a lesser degree in the capital, and in the incorporated workers' settlement.

Initially the factories of Budapest had been established almost exclusively along the Danube because of the cheap means of transport that it offered. In the beginning there were chiefly steam-mills in Ferencváros, Lipótváros, Angyalföld and Óbuda. After the railway lines were constructed the industry

Electrical generating	Building materials	Chemicals	Wood and furniture	Paper and printing	Textiles	Leather and shoes	Food	Total 1959*	Total 1970**
—	—	—	—	9·6	—	—	—	0·3	0·9
—	—	—	—	—	—	—	0·2	1·2	1·9
—	21·6	—	4·6	—	11·6	—	1·1	5·5	4·2
3·9	—	16·8	16·0	1·4	13·5	59·0	2·2	10·7	8·6
4·4	—	—	—	21·2	0·3	—	0·4	1·1	4·1
—	—	—	—	11·8	—	—	0·0	0·9	2·9
—	6·3	—	3·2	20·7	0·4	—	2·4	1·4	4·1
—	—	18·6	7·4	9·3	5·9	6·8	2·6	8·1	7·4
—	1·3	13·8	16·3	—	6·5	—	34·3	6·7	6·6
—	37·0	29·5	10·5	—	7·5	6·9	29·8	14·0	12·3
12·5	7·4	2·3	1·7	—	15·3	—	12·4	8·8	8·7
—	—	—	—	—	—	—	—	—	1·3
55·5	7·9	0·4	19·6	4·4	10·4	0·1	1·2	14·5	12·7
—	6·5	4·9	8·0	3·1	2·5	12·2	1·7	5·1	5·3
—	—	0·9	3·2	—	1·5	9·1	4·0	1·2	1·7
—	0·1	—	—	—	—	—	—	1·5	1·8
—	—	2·7	—	—	—	—	—	0·1	0·4
—	3·3	—	—	—	11·4	—	0·3	3·1	2·0
—	6·7	—	—	—	4·5	—	0·9	2·8	2·1
—	1·3	0·9	—	2·5	4·5	—	1·8	1·7	2·5
23·7	0·6	3·2	—	11·7	3·3	6·5	2·3	9·5	6·4
—	—	6·8	9·5	5·3	0·9	—	4·6	1·8	2·1
100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0 602,400 workers

of Budapest began to use rail transport, and industrial plants sprang up in the neighbourhood of the marshalling yards, particularly, metal factories, engineering works, rubber-processing plants and tanneries. Owing to the rapid expansion of the city, the large-scale factories of "Mávag" and the "Ganz Railway Car Company" founded in the second half of the last century at Kőbánya, Újpest, Krisztinaváros, predecessors of "Táncsics" and "Újpest Tanneries", etc., were located in areas where residential development was also occurring. This has since proved disadvantageous for two reasons. Firstly the amenity of the inhabitants living in the residential quarters is destroyed by widespread pollution and secondly no further industrial expansion is feasible. In the past, owners of the plants tried to protect themselves by large-scale building. This is, however, regarded in the present phase of plant development an obstacle to production and observation of technological rules, rather than a promoting factor.

The new factories, mainly textile works, founded after the First World War did not produce new industrial quarters or regions in Budapest, as they

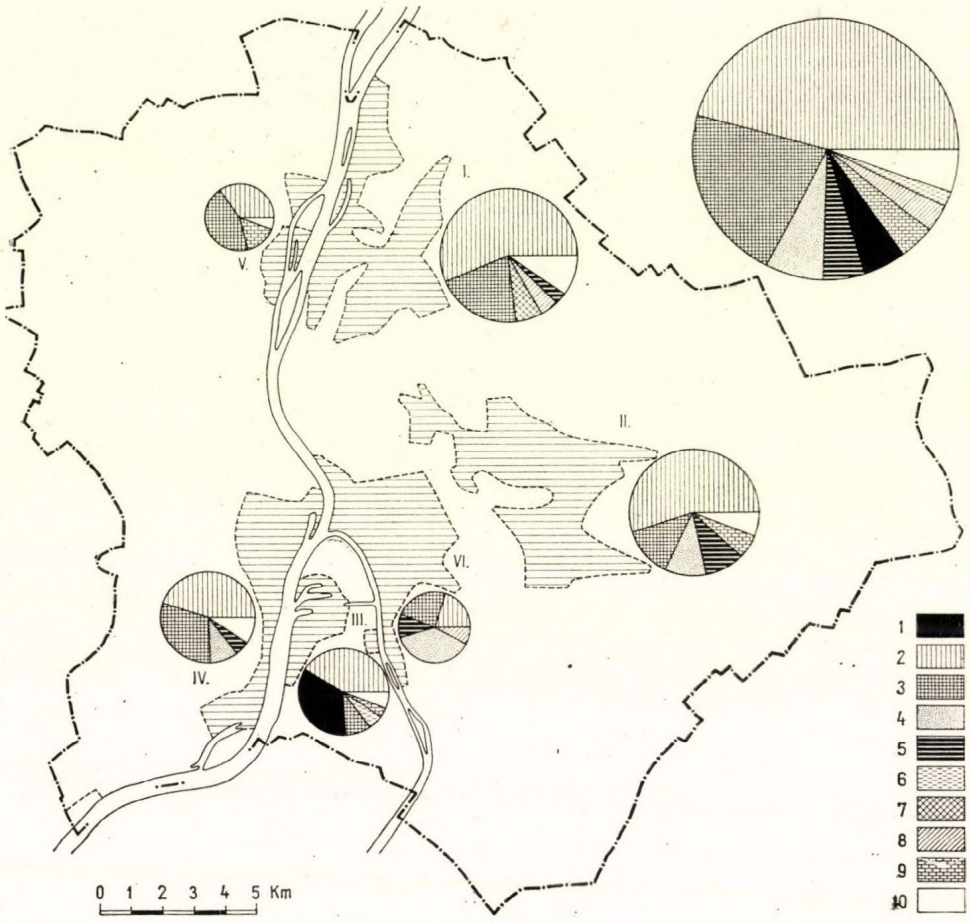


Fig. 7. Structure of the Budapest manufacturing industry (according to industrial districts) 1 = metallurgy; 2 = engineering industry; 3 = textile industry; 4 = food industry; 5 = chemical industry; 6 = electrical generation industry; 7 = leather and leather products; 8 = lumber and wood products; 9 = building materials ; 10 = others

were dispersed throughout the town, being located in vacant food processing factories, store-houses, former buildings of the armaments industry and other vacant factories.

The distribution of industry changed somewhat after 1945, following nationalization. A large number of small plants utilizing obsolete technology and machines were either closed down or amalgamated with larger factories. This applied mainly to those in the residential quarters of the city. Through this process the significance of the industrial regions of Budapest increased considerably.

Before discussing the individual zones of Budapest the distribution of manufacturing industry in the 22 administrative districts of the capital will

Fig. 8. Structure of engineering industry and metal processing in Budapest according to administrative districts and number of productive workers
1 = machine and machinery building industry; 2 = production of electrical machines and appliances; 3 = telecommunications and vacuum engineering; 4 = precision engineering; 5 = iron and metal mass products, for industrial purposes; 6 = iron and metal mass products for consumptional purposes; 7 = repair of communication equipment; 8 = others

be briefly surveyed, which helps place the industrial zones of the capital in perspective (Tables XVI and XVII). About half the total industrial production is concentrated in Angyalföld, Kőbánya, Újpest and Csepel which constitute 17·6 per cent of the total area of the capital. A further four districts, namely Kelenföld, Józsefváros, Ferencváros and Óbuda, employ about 30 per cent of all industrial workers. Among the other districts of non-industrial character Zugló may be mentioned, with its wide scattering of both large and small plants. The other 13 districts of the capital employ only about 17 per cent of the total industrial workers of Budapest.

From Tables XVI and XVII it may also be seen that, firstly, every industrial branch is represented in each district, and secondly, that each district has its own clearly defined production scheme. In Angyalföld, for instance,

the metal-working industry, such as motor-car repair and metal-ware manufacture is the leading branch. In Újpest the electric and leather industry, in Csepel steel and metal production, and the engineering industry, in Ferencváros the food industry, in Józsefváros transportation equipment manufacture, and in Óbuda textiles and the building materials industry are the typical and leading branches. Table XVI also demonstrates that the industrial structures of Kőbánya (10.) and Zugló (14.) broadly correspond to that of Budapest as a whole.

The above data, however, are inadequate for a precise analysis of manufacturing industry in Budapest, since it is not distributed evenly within the districts, but occurs in well defined concentrations. For instance, Kőbánya, Újpest and Kelenföld are predominantly residential rather than industrial quarters and the industrial data for each district characterize not the whole but only a part of it.

Thus, the city districts cannot be used as the basic units for an economic–geographic analysis of manufacturing industry in Budapest. At the same time it would be wrong to ignore completely the present administrative division of the city as the administrative boundaries of the districts were established in 1950, after taking into consideration economic, political and geographical factors.

On the basis of the geographical distribution and horizontal and vertical linkages of factories employing more than 100 workers, an analysis of traffic flows related to the 51 rail freight yards of Budapest (Fig. 7), and data concerning commuting 6 relatively important industrial districts were recognized in the capital. All six consist of contiguous industrial or industrial-residential quarters. The production unit of the industry in the conjectured districts is of somewhat conditional validity and can only be realized in the future by further specialization and coordination in the industrial plants (Fig. 8).

About three-quarters of those employed in the manufacturing industry in Budapest work in these six industrial districts. The remaining 25 per cent are engaged in areas where industry does not form a contiguous zone. In terms of number of employees the North-Pest district is most prominent among the industrial zones, containing 25 per cent of all workers in manufacturing industry in Budapest. Almost as large is the south-eastern industrial district centered on Kőbánya while the industrial regions of Csepel and South-Buda are somewhat smaller.

The linear arrangement of plants and factories along the main communication routes is common to each industrial zone. In North-Pest the industrial strip extending along Váci Street is predominant, while in the South-eastern district the linear development along Kőbányai Street and its continuation Gyömrői Street is most significant. In South-Buda factories are located in two linear strips along Budafoki and Fehérvári Streets. Cluster arrangements of factories only occur in North-Buda, the oldest industrial districts of Budapest. The location of industrial plants in Zugló, Kispest, Pestlőrinc, Rákospalota, and the difference between them in terms of structure is on a smaller scale. As regards the main feature of the Csepel industrial zone it is restricted to one mammoth plant, and 2–3 large-scale ones.

The linear arrangement of manufacturing industry in Budapest relates to the city's function as a communication centre. It is striking that the principal industrial areas extend along the Danube, and according to calculations made more than two-fifths of the total number of industrial employees in the capital are working in factories located less than 1 km from the Danube. It is worth mentioning that the most important rail freight yards, namely Budapest West, Rákos marshalling yard, and Ferencváros are also near the river while with exception of that following Bécsi Street, all industrial zones parallel railway lines. Indeed, close ties exist between the railways and some industries. Thus, for instance the locomotive building works along Kőbányai and Gyömrői Streets are linked with the Borsod industrial region which until recent times supplied much of the metal raw material for this sector. Soroksári Street and its vicinity, from which radiate the railways to the Great Plain is "interspersed" with mills, slaughter houses, canning factories, oil presses and other plants associated with the food industry. An up-to-date wool industry has also developed here out of the former wool handicraft industry which was supplied with raw material from the Great Plain. The development of fertilizer production in the zone relates as well to its good communications with the south-eastern part of the Great Plain.

1. THE NORTH-PEST INDUSTRIAL DISTRICT

The North-Pest industrial zone, comprising the industrial plants of Újpest and Angyalföld, employs about 25 per cent of the industrial workers of Budapest. The most important industrial area runs along Váci Street, the industrial backbone of both Újpest and Angyalföld in which are employed about one-third of the workers in the zone, i.e. 34 per cent in Angyalföld and 31 per cent in Újpest.

Factories in Váci Street are larger than the average sized industrial plant in the zone. Thus, of the ten factories employing more than 1000 workers, seven are in Váci Street, including "Egyesült Izzó", which in 1972 employed 20,000 workers. Besides those along Váci Street, two further industrial concentrations are situated in the eastern half of the zone along the Budapest–Vác railway line.

The significance of the North-Pest zone in the industrial structure of Budapest is shown by the fact that it employs nearly one-quarter of all workers in engineering, one-quarter of those in textiles, 57 per cent of those in the leather and shoe industry, and one-third of those in the wood industry.

The structure of manufacturing industry in the North-Pest industrial zone (in per cent of number of persons employed)

(1) Engineering	56·2
of which: repairs of communications equipment	9·2
(2) Textiles	20·8
(3) Leather and shoes	6·1
(4) Wood and furniture	3.9
(5) Chemicals	3·2
(6) Other branches	9·8
Total	100·0

The North-Pest industrial zone is favoured from the transport point of view. Thus, the Budapest–Vác and Budapest–Esztergom main lines both traverse the edge of the zone. An important role is also played by the branch line extending to Vizafogó while the zone is connected with the important Kőbánya industrial district by two railway lines. Most of the goods traffic of the zone thus goes by rail. River transport is slight although Újpest-harbour is used for shipbuilding and ship repair, and as winter quarters for river-craft.

Angyalföld and Újpest are typical industrial districts although historically they differ. For instance, Angyalföld was always a district of Budapest, while Újpest was only amalgamated with the city on January 1st 1950. At the time of high land rents and heavy taxation in the capital, it was more favourable to locate plants outside the legal boundaries of the city which stimulated the rapid establishment of factories in large numbers in Újpest at the end of the 19th and the beginning of the 20th centuries. Even today Újpest bears the marks of an industrially developed provincial town, being characterized by one-storey houses and drab factory buildings.

Although the structure of manufacturing industry in Újpest and Angyalföld is similar, some differences still exist. Owing to the relatively late date of industrial development average plant-size is larger in Újpest than in Angyalföld where in the past plants employing only a few workers were important. Thus large up-to-date industrial plants of engineering, light chemical and cotton industry are located in Újpest. None exists in Angyalföld. Tanneries are also concentrated in Újpest.

Thirteen large-scale plants have likewise been established along Váci Street including "Egyesült Izzó". Factories in the immediate neighbourhood of Váci Street number 17, while in other parts of Újpest there are further 25 small industrial plants. Among the factories outside Váci Street zone the "Hungarian Cotton Industry" (4000 workers), "Landler Jenő Railway Yard Works" (2700 workers), and "Chinoin" (1600 workers) are the more important. The last two were established at the junction of the Budapest–Esztergom and Budapest–Vác railway lines, which has developed into a considerable industrial concentration in which about 10 per cent of the workers of the North-Pest district are employed.

Leather and shoe manufacture is important in Újpest, where 4000 out of a total of 7000 are employed in this sector. "Táncsics" and the "Tannery of Újpest" are the largest, closely followed by the "Plastic Leather Plant" and "Luxury Leather" companies. All are located in the Váci Street zone.

The "Duna" Shoe Factory—the largest of its kind in the country—producing 2 million pairs of shoes and boots annually is in Újpest. Indeed the existence of a small factory building machines and equipment for tanneries has led to the vertical integration of the leather and shoe industry in the Újpest-portion of the zone.

Concerning the wood industry Újpest specializes in furniture manufacturing while Angyalföld concentrates on carpentry for the building industry.

The development and growth of industry in Angyalföld are closely connected with Váci Street. Before the appearance of the electric tram, horse-drawn trams, the first of the kind in the capital, plied through Angyalföld as far as

Újpest which stimulated the establishment of industrial plants along Váci Street. Shortly after the Budapest–Vác railway line was opened and the freight yard of Lipótváros built, greatly reducing the transport costs of the existing factories. Additionally, the fact that the first water and gas pipelines in Pest were built in Angyalföld contributed to industrial development along Váci Street.

Angyalföld being the earliest industrial district in Budapest is still an area of many small old-fashioned plants. Small-scale dispersed production is still characteristic although nationalization led to the amalgamation or closure of a number of small factories. A further characteristic is that many of its products are manufactured in plants employing a small number of workers. Thus, for instance, one-third of the workers in Budapest employed in factories utilizing mass-commodity production, are in Angyalföld. Similarly the bulk of the repair shops for motor vehicles, buses, and tram cars are also in Angyalföld, where about 40 per cent of the total number of workers in the repair industry of Budapest, i.e. 3600 out of a total of 9600 are employed. Nationally, Angyalföld occupies a leading place in the manufacture of hand tools and metalware. The production of motor spare parts in a former Bosch subsidiary was located in Angyalföld before the war, a result of the productive experience and skill of the workers in Angyalföld.

Large-scale plants have developed between the two world wars due to, among other things, increased number of workers, production value and cooperative connections, etc. (e.g. "Láng Machine Works", "Hungarian Ship and Crane Yard", Angyalföld, "Hemp and Jute Mill", etc.).

2. THE SOUTH-EASTERN INDUSTRIAL DISTRICT

The south-eastern industrial zone is one of the oldest in Budapest comprising in the east Józsefváros where are located "Ganz-Mávag" and the "May 1st Clothing-Factory". The industrial quarter of Kőbánya is in the west and the residential quarter of Kőbánya in the north and south. About 20 per cent of the industrial workers of Budapest are employed in the plants and factories of this district.

Industrial activity started at the beginning of the last century. It was first limited to limestone, and brick production from local clay and as a result Kőbánya soon became the leading base of the building materials industry in Budapest. During the course of production limestone caverns were formed underground, which have subsequently been used by the brewing and later the canning industry as "natural" refrigerated warehouses.

The building of the Budapest–Cegléd railway line in 1848 and its later extension attracted other industrial plants of Kőbánya, particularly engineering factories. Further expansion occurred with the construction of textile mills, while between the two wars the manufacture of electrical machines within the engineering industry rapidly developed.

Currently cotton spinning and weaving within the textile sector is considerable while the two most important pharmaceutical works in Budapest,

namely the "Pharmaceutical Works of Kőbánya" (formerly Richter) and the "United Pharmaceutical and Food Preparations" (formerly Wander) are local industries.

The employment structure of manufacturing industry in the south-eastern industrial district, 1959 (in per cent)

(1) Engineering	53·9
(2) Textiles	13·0
(3) Food	10·3
(4) Chemicals	9·9
(5) Building materials	5·6
(6) Other branches	7·3
Total	100·0

It can be seen that the structure of manufacturing within the South-eastern Industrial District resembles that of Budapest as a whole differing from it significantly only in the higher proportion of the building materials industry. The industrial aspect of the zone is largely determined by the engineering industry employing about a quarter of the total workers in the sector in the capital. "Ganz-Mávag" is the largest engineering plant in the district and in 1969 alone employed about 25,000 industrial workers. Thus, after the "Csepel Iron and Metal Works", it is the second ranking plant in the country. In contrast to the "Csepel" Company the primary metallurgical units of "Ganz-Mávag" supply its own machine works only while rolled steel is brought in from Miskolc, Ózd, Borsodnádasd and Csepel.

The factories in the South-eastern District may be grouped as follows:

(1) Plants using "natural" raw materials, i.e. works, iron-proof material factories, breweries and canning works.

(2) Plants benefiting from the geographical advantages of the zone, i.e. the manufacture of vehicles and railway repair shops.

(3) Plants and production features derived from the seasonal fluctuations in the breweries and canning factories producing surplus manpower, electrical energy and water during the dead periods. Chocolate, cooking oil, candy and wafer plants and some textile mills came into being because of this.

(4) Plants established to supply the existing factories with auxiliary and packing materials, hand-tools, and repair services, for example, cask and box manufacture and the repair of building industry equipment.

With all its advantages, the zone unfortunately experiences a considerable shortage of industrial water. This is mainly felt in the food plants established at the end of the last century before industrial water consumption had not reached its present level. The plants cover their water requirements partly from the city mains supply and from their own artesian wells, which owing to heavy consumption are now very nearly exhausted. Thus, in the last few years, especially in summer, water shortages are more and more becoming evident.

The majority of industrial plants are located along the four main routes traversing the South-eastern District namely along Kőbányai, Gyömrői,

Jászberényi and Maglódi Streets. In Kőbányai Street the manufacture and repair of rolling stock is the leading branch while along the Gyömrői Street electrical and chemical engineering industry is prominent. Along Jászberényi and Maglódi Streets breweries and brick factories are located.

3. THE CSEPEL INDUSTRIAL DISTRICT

The Csepel district is situated on the south side of the capital, at the northern end of Csepel Island. The centre of the heavy industry of Budapest—the "Csepel Iron and Metal Works"—is located here employing eighty per cent of the workers in the district. The "Csepel Paper Mills" and the "Hungarian Woollen Fabric Mills" are the other large factories of the District. The latter ranks second in the Hungarian wool industry while the former is not only the largest paper mill in the country but also the only plant where all three phases of paper and paper ware manufacture are carried out. "Mirelite", a frozen foodstuff company, is mentioned for completeness.

Employment structure of industry in the Csepel District, 1959 (in per cent)

(1) Metallurgy	41·0
(2) Engineering	36·4
(3) Textiles	7·5
(4) Electricity generation	5·1
(5) Paper	4·4
(6) Other branches	5·6
Total	100·0

The northern end of Csepel Island, ideal for industrial expansion, is situated near the other great industrial concentration of the capital at Kőbánya, Kispest and Ferencváros while two branches of the Danube serve as navigable water-ways, and supply industrial water. The "Csepel Iron and Metal Works" consumes about 200,000 cu.m water daily, while the daily consumption of the Paper Mill amounts to a further 26,000 cu.m. Excluding the Electricity Generating Station at Kelenföld with a daily water consumption of about 500,000 cu.m, the industrial zone of Csepel is the largest consumer of industrial water in the capital. Fortunately, however, the factories of Csepel are generally self-supporting as regards water deriving 98 per cent of their supply from their own water-works.

In addition to the "Free-port" of Csepel, the Industrial District also has its own harbours. The coal supply of the "Csepel Metal Works" is brought from the Dorog field by water. The harbour also handles finished products, such as machine-tools, motor-cycles, bicycles, sewing machines and metal-ware. At present steel arrives by rail from Dunaújváros, a change-over to water transport is planned.

Since the "Csepel Iron and Metal Works" is the largest of its kind in Hungary, a short survey of its history and present production follows.

The "Weiss Manfred Works" was first established in 1884 on the left side of the Danube for the manufacture of tin cans. Since the manufacture of

canned goods to supply the army was seasonal in character, Manfred Weiss, the founder of the works, turned one of his shops over to the mass-production of tin cans in the dead season. The production of cartridge cases was also started and a licence for cartridge manufacture acquired in 1895. The plant was then shifted to Csepel, on account of the fire and explosion risks of cartridge manufacture. The works began to develop rapidly and arranged for the

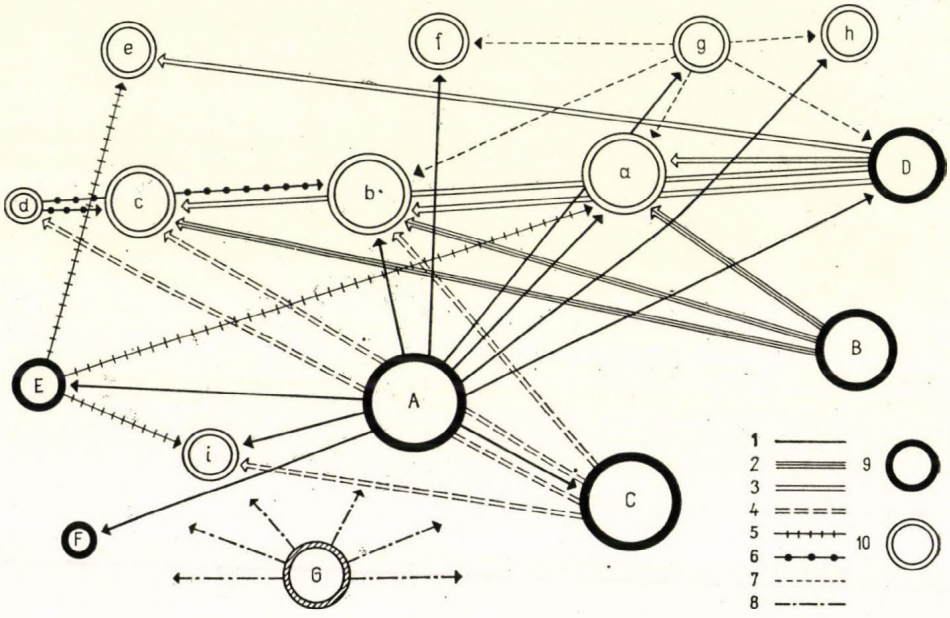


Fig. 9. Cooperation between the factories of the "Csepel Iron and Metal Works"
1 = steelware; 2 = non-ferrous metal, cast; 3 = cast iron, steel-cast; 4 = pipes, rolled stock; 5 = smithery; 6 = ball bearing; 7 = hand tools; 8 = electric power; 9 = factory of metallurgical cycle; 10 = factory of the engineering cycle
A = steel mill; B = factory of non-ferrous metal; C = pipe mill; D = iron and steel foundry; E = forge mill; F = factory of electrodes, G = power plant
a = machine-tool factory; b = bicycle factory; c = motorcycle factory; d = ball bearing factory; e = sewing machine factory; f = factory of iron and metal mass products; g = instruments and tools factory; h = factory of individual (non-serial) machines

production of a variety of military equipment. A foundry and rolling-mill were built in 1896, while in 1899 a large copper rolling-mill was put into operation. By the outbreak of the First World War the "Weiss Manfred Works" had become one of the largest suppliers to the army.

At the end of hostilities the transfer to peaceful production met with serious difficulties, the lack of export possibilities and the narrow home market not permitting large-scale production. In the early twenties attempts were made to manufacture tractors, agricultural machinery, lorries, buses and even passenger cars, but the cost of these commodities, produced in small series, rose to twice the average level prevailing on the world market. Only

sewing machines (from the middle twenties), bicycles (from 1929) and motorcycles (late thirties) were produced in significant quantities.

The war preparations of the middle thirties also affected the "Weiss Manfred Works", which was the first company in the capital to commence the bulk manufacture of military equipment. Thus, during the Second World War the company became the most important armaments plant in the country, producing guns, military lorries, tanks and towards the end of the war spare parts for military aircraft.

At present the "Csepel Iron and Metal Works" is not only the largest engineering works in the country but also the largest employer of labour. In 1969 more than 40,000 workers were employed while the value of industrial commodities produced exceeded 2·9 milliard forints.

Organizationally the complex is divided into two large groups. The metallurgical group employs about 19,500, and the engineering group about 15,500 persons. A further 3000 are employed at the power-station and in the central offices. Single departments enjoy a certain organizational and production independence, although in matters of external and internal cooperation they are subordinated to the central management (Fig. 9).

It is planned that "Csepel" will also become the centre for Hungarian transformer manufacture in Hungary, the first stage of which was completed in 1960 when a transformer plant was established. Production for the Hungarian domestic market will thus gradually cease at the "Klement Gottwald Electricity Plant".

4. THE SOUTH-BUDA INDUSTRIAL DISTRICT

The South-Buda industrial zone is situated on the right-hand bank of the Danube, in the south-weastern part of the capital. This district—the youngest industrial zone of Budapest—comprises Lágymányos, the eastern part of Kelenföld and the Budafok-Háros linear development along the Danube. With the exception of the "April 4th Machine Works", and the "Cable and Wire Works" all the large factories of the zone were established during the inter-war period.

Although the district stretches along the Danube, its plants hardly use the river for transport. Raw materials and finished products are delivered by rail, the most important transfer point being the freight yard at Kelenföld. Most plants have their own rail sidings.

Industrial development has occurred linearly along Fehérvári Street where 31 per cent of the labour force is employed and along Budafoki Street where 18 per cent of employment is concentrated. The bulk of the factories along the former were established between the two wars, while along the latter the bulk of the plants date from the pre-1914 period.

The industrial development of the district was preceded by viti- and wine-culture which led to the establishment of champagne and cognac factories. A more significant factor, however, was the presence of limestone which attracted breweries and poultry processing plants, in addition to the above sectors. The cellars in the limestone provided excellent storage facil-

ities, which are at present occupied by the "State Wine Cellars of Budafok", one of the most important companies within the trade.

Relatively speaking, the industry of Budafok was more important before the First World War than now. At that time wine cellars, breweries and match and wood-panel factory were established. The relative reduction in the transport function of the Danube also influenced the development of the Budafok plants.

Now the leading branches within the South-Buda District are the engineering and textile industries. Of the engineering factories "Emag", the Hungarian agricultural machine works, is the oldest foundation.* Before the war it manufactured various implements, and small machines but after 1945 concentrated on the production of grain-combine harvesters, about three-quarters of which were exported. The "Beloiannis Works" is the most important plant within the telecommunications sector exporting more than half its finished products, exclusively to other socialist countries. Cable manufacture is similarly important within the zone, all three cable factories in the capital being located in South-Buda.

Among the textile works the "Goldberger" factory, which is the largest cotton plant in Hungary, is outstanding. Only the spinning and weaving sections operate in South-Buda, the grey fabrics being finished in Óbuda.

The "Milk Industrial Enterprise of Kelenföld" supplies the western part of Budapest with milk and dairy products. The "Poultry Processing Firm" at Budafok is the only plant of this kind in the capital, and uses limestone cellars.

5. THE ÓBUDA INDUSTRIAL DISTRICT

The textile works of Óbuda industrial zone developed out of the handicraft industry, finishing plants being particularly characteristic. Engineering is represented by the Shipyards of Óbuda, which is now occupied by the "Hungarian Ship and Crane Company". Other important engineering works are the "Agricultural Machine Factory of Budapest" and the "Mechanical Measurement Instruments Company". The building materials industry, larger than the Budapest average, is likewise characteristic of manufacturing in Óbuda. A few small food plants are also located in Óbuda, of which the "Óbuda Steam Mill", one of the oldest steam-mills in the capital, and the "Distillery of Óbuda" are worth mentioning.

In the northern part of the district the Gas-Works are located which supply the capital with industrial and household gas. The Gas-Works have their own quary on the Danube.

The employment structure of industry in Óbuda, 1959 (in per cent)

Textiles	46·3
Engineering	34·5
Building materials	15·5
Other branches	3·7
Total	100·0

* Since 1963 it has specialized in telecommunications equipment.

The finishing of cotton and silk cloths is the oldest manufacturing branch in Óbuda, and indeed in the capital, the "Goldberger" company being founded in 1784, and the predecessor of the "Cotton Finishing Company" in 1826. At present five finishing plants are in operation in the zone, of which four specialize in finishing cotton cloth and one silk cloth. Additionally, there are three textile mills in the district, namely the "Linen Fabrics Plant of Csillaghegy", the "Buda Hosiery Mill" and the "Hat-Factory". The finishing plants were established near the Danube because of their large consumption of water.

The industrial plants in Óbuda are not arranged linearly. Thus, Bécsi Street and Szentendrei Street, the most important routes traversing the zone, are less imposing from the industrial point of view than Váci, Soroksári or even Fehérvári Streets. The brickworks on Bécsi Street were so located because of the presence of raw materials.

The shipyard of Óbuda was the only engineering plant established before the revolution of 1848. After several reconstructions the shipyard is now engaged in building river passenger and tug boats for export. In 1960 it ceased building steam powered vessels and changed over to Diesel-engined passenger and cargo boats. For the time being the engines are imported from the GDR. The construction of engines by either "Ganz" or "Láng" is planned for the future, however.

6. THE SOUTH-PEST INDUSTRIAL DISTRICT

The South-Pest industrial district extends in a narrow strip along the left-hand bank of the Danube close to the Csepel zone, and employs between 6 and 7 per cent of the industrial workers of the capital. The associated factories are situated mainly on Soroksári Street which runs parallel with the Danube, and here more than 45 per cent of all the workers in this zone are employed. The plants on Soroksári Street are early foundations, and many of the mills and wool washing plants represent the beginning of industrial development in the city.

The South-Pest District is the centre of the Budapest food industry, employing one-third of the total workers in the capital in this sector. Almost all the branches of the food industry in Hungary are represented, milling, meat processing and canning industries being prominent.

The establishment of milling in Ferencváros relates to the closeness of the Danube, which played a greater role in the communications of the country towards the end of last century than now, the period when the large commercial mills were founded. At present there are only five cylinder mills and 1 pastry factory in the district, in which are engaged more than 90 per cent of the millers in the capital.

In the establishment of meat-packing plants in Ferencváros an exceptionally important factor was that slaughter-animals were formerly driven to the left bank of the Danube from the Great Plain. Milling and meat-packing led to the growth of other sectors of the food industry in Ferencváros. Thus, for instance, offal from the slaughter-houses is utilized by a

processing plant in the production of animal vaccine while salami manufacture relates to the slaughter of pigs.

A further example is the confectionery industry which relied on the flour surplus from the neighbouring mills.

In addition to five woollen mills of national importance, engineering works, for instance, the "Milling Machinery Plant" and the production of chemicals can be found in the zone. These three branches combined employ about half of the industrial workers of South-Pest.

The chemical factories produce fertilizers, insecticides and pesticides for agriculture, and sulphuric acid. Although the existence of chemical and food plants within the same zone is not desirable from the point of view of public health, it is not planned for the time being to relocate either sector. In the future, however, not only the removal of chemical plants detrimental to health is scheduled but also the closing down of several food plants which hinder effective city planning.

SUMMARY AND CONCLUSIONS

After this brief survey of the economic geography of manufacturing industry in Budapest, the following conclusions can be drawn.

(1) The concentration of manufacturing industry of Budapest relates to capitalist development in Hungary. The disintegration of the Austro-Hungarian Monarchy and the creation of a successor Hungary, while increasing the proportion of industry within the capital, provided at the same time possibilities of the expansion of several, former underdeveloped, industrial sectors. This process manifested itself above all in Budapest, where not only light industry, primarily textiles, but also heavy industry started to develop rapidly. Growth in the latter sector was based on the availability of skilled labour and its most important products were high- and low-voltage electric motors. From the middle of the 1930s preparations for war resulted in the expansion of the metal working and engineering industries in the capital. During the whole of this interwar period the industry of Budapest had more connections with foreign countries than with the provincial areas of Hungary.

(2) After 1945, the rate of expansion in manufacturing industry was higher in the provinces than in Budapest. Thus, the number of industrial workers in the capital dropped from 61·9 per cent of the total in 1938 to 43·3 per cent in 1961 and 34 per cent in 1970.

(3) A number of non-urban sectors occur in the structure of manufacturing industry in Budapest, for example, heavy chemicals and ferrous and non-ferrous metallurgy which have been inherited from the capitalist past. In the future, however, the structure of manufacturing industry in the city will be modified in such a way that the proportion of industrial branches processing raw materials will be reduced, and expansion restricted in those sectors consuming relatively little raw material and requiring skilled labour.

(4) The varied structure of manufacturing industry in Budapest has led to the establishment of many international and inland connections. As seen from this study, the commercial and cooperative relations of manufacturing industry in Budapest with neighbouring socialist countries are far more intimate than before 1945. Through the medium of CMEA this development has had a favourable influence by producing planned and stable facilities for the import of raw materials, and the export of finished products. After 1945, economic relations developed most vigorously with the Soviet Union, which soon became the most important supplier of iron-ore, cotton, synthetic rubber, apatite, crude oil and timber, and the almost exclusive customer

of a number of important industrial products. The other socialist countries also provide steady markets.

(5) The links between manufacturing industry in Budapest and the provincial economic regions have strengthened considerably in the last 25 years. Thus, the provinces now supply metal, coal, crude oil, natural gas and agricultural raw materials, while other cooperative connections have been built.

Since the Northern Industrial Region is the most important basic material producing zone in the country, it follows that it is this region that manufacturing industry in Budapest has most significant links with. Thus, between 80 and 85 per cent of the crude steel and rolled steel produced in Miskolc, Ózd and Borsodnádasd is consumed by the factories in the capital. Additionally, considerable quantities of glass-ware, wood, chemicals, cement and coal are likewise sent to Budapest. Formerly the "Mátra Generating Station" supplied Budapest with electrical energy, which has now been superseded by the new generating station of Tiszapalkonya as the most important supplier of electrical energy to the capital.

The links between Budapest and the western part of Hungary are likewise strong since the Dorog region supplies the capital with coal, electrical energy, cement and paper. Moreover, the engineering plants in Budapest receive semi-finished products and spare parts from Győr, the same town supplying the textile finishing plants of the capital with grey fabric. The Veszprém district furnishes Budapest with aluminium, wood and paper, while crude oil and natural gas are transported from County Zala. The "Integrated Iron and Steel Works" at Dunaújváros is jointly with the plants in Borsod an important supplier of rolled steel to the capital's engineering industry.

Agricultural produce is sent from various districts in the country to the processing plants of the capital. County Szabolcs-Szatmár, for instance, provides fermented tobacco and oil-seeds; wheat, hemp, meat and wool are obtained from the south-eastern part of the Great Plain, vegetables and fruit from the Danube–Tisza mid-region and animal produce from South-Transdanubia.

It is also important to note that after 1945 manufacturing industry in Budapest forged entirely new links with the districts specializing in agricultural produce mainly in the sphere of semi-finished industrial products. Thus, for instance, large quantities of cotton yarn arrive in Budapest from Szeged and Kaposvár, as do chemicals and paper from Szolnok. On the other hand, the new engineering works in the agricultural districts derive considerable quantities of iron castings and machine spare parts from the capital.

However, even though cooperation between Budapest and the provincial industrial towns has expanded appreciably during the last 10 to 15 years, the structure of manufacturing industry within the capital is so varied that complex and widespread links have been welded between its various industrial sectors and plants. These intricate connections make it exceedingly difficult to decentralize the manufacturing industry of the capital. Thus, despite the drawbacks resulting from high concentration, the large-scale reconstruc-

tion of existing plants cannot be postponed because, on the one hand, technological progress cannot be renounced, and on the other, the national economy cannot afford the cost of creating a large number of new plants in the provinces. Thus, the industrial weight of Budapest will not lessen significantly in the near future, although the high concentration of manpower will be somewhat reduced. A balanced distribution of productive capacity between Budapest and other industrial zones of the country can only be realized economically and successfully in the long term.

BIBLIOGRAPHY

Adametz, Gy. (1947) *Angyalföld (Budapest XIII. ker.)* (Történelmi és földrajzi tanulmány) (Angyalföld District 13. Historical and geographical study). Családi könyvesbolt főbiz., Budapest, 142.

Árvay, J. (1941) *A magyar ipar* (The Hungarian industry). Athenaeum, Budapest, 522.

Autorenkollektív (Red.: Radó, S.) (1963) *Ökonomische Geographie der Ungarischen Volksrepublik*. Verlag der Wirtschaft, Berlin

Bartke, I. (1967) Területi egységek ipartelepítési szintjének meghatározása (The level fixation for the industrialization of territorial units). *Közg. Szle.*, Nos 7–8, 28–52.

Berend, T. I. and Ránki, Gy. (1955) *A magyar ipar fejlődése az első világháborúig* (The development of the Hungarian industry before the First World War). Szikra, Budapest, 396.

Berend, T. I. and Ránki, Gy. (1958) *Magyarország gyáripara a második világháború előtt és a háború időszakában* (1933–1944) (The Hungarian manufacturing industry before and during the Second World War). Akadémiai Kiadó, Budapest, 624.

Berend, T. I. and Ránki, Gy. (1961a) *A Budapest-környéki ipari övezet kialakulásának és fejlődésének kérdéséhez* (On the formation and growth of the industrial belt around Budapest. Studies from the past of Budapest). Akadémiai Kiadó, Budapest, Vol. 14, 535–573.

Berend, T. I. and Ránki, Gy. (1961b) Das Niveau der Industrie Ungarns zu Beginn des XX. Jahrhunderts im Vergleich zu dem Europas. (In "*Studia Historica, Academiae Scientiarum Hungaricae*"), Akadémiai Kiadó, Budapest, 267–289.

Beynon, E. D. (1943) Budapest—an ecological study. *Geographical Review*, No. 33, 256–275.

Bora, Gy. and Kóródi, J. (1959) A népesség, a munkaerő és az ipar területi koncentrálódása és a fővárosi túlzsúfoltság (The territorial concentration of the population, labor force and industry and the overcrowdedness in the capital). *Közg. Szle.*, Nos 8–9, 892—907

Bora, Gy. (1958) *Lakóhelyünk Budapest. Budapest ipara* (Budapest Our. Place of Presidence. The industry of Budapest). Gondolat, Budapest, 175.

Boros, F. (1961) Városaink ipari szerepének néhány problémája (Some problems of the industrial function in the Hungarian cities). *Földr. Ért.*, No. 4.

Bulla, B. and Mendöl, T. (1947) *A Kárpát-medence földrajza* (The Geography of the Carpathian Basin). Egyetemi Nyomda, Budapest, 611.

Farkasfalvy, S. (1928) Budapest gyáripara 1921–1926-ban (The manufacturing industry of Budapest 1921–1926). *Stat. Közl.*, Vol. 56, No. 4.

Fellner, F. (1934) Budapest szerepe a dunai forgalomban (The role of Budapest in the transportation on the Danube). *Stat. Közl.*, Vol. 73, No. 4.

Futó, M. (1944) *A magyar gyáripar története* (The history of the Hungarian manufacturing industry). Magyar Gazdaságkutató Intézet különkiadványa, Budapest, 468.

Gárdonyi, A. (1925) *Ötven esztendő Budapest székesfőváros történetéből 1873–1923* (Fifty years of Budapest as a capital city 1873–1923). Szfőv. Háziny., Budapest, Vol. 6, 163.

Gárdonyi, A. (1944) *A hétszázéves Budapest* (The 700 years of Budapest). Palladis, Budapest, 132.

Haltenberger, M. (1942) *Budapest városföldrajza* (The urban geography of Budapest). Stephaneum Nyomda, Budapest, 160.

Haltenberger, M. (1944) *Budapest elővárosai* (The satellite towns of Budapest). Szfőv. Háziny., Budapest, 25.

Illyefalvi, I. L. (1938) *A hatvanéves Budapest* (The 60 years old Budapest). Szfőv. Stat. Hiv., Budapest, 386.

Karaska, G. J. and Bramhall, D. F. (1969) *Locational analysis for manufacturing*. The Massachusetts Institute of Technology, Cambridge (Massachusetts). London, 514.

Kóródi, J. (1962) *A magyar ipar elhelyezkedésének távlatai* (The perspectives of the territorial distribution of the Hungarian industry). Kossuth Könyvkiadó, Budapest, 252.

Kóródi, J. (1967) A magyar ipar területi elhelyezkedésének és településének sajátosságai (The characteristics of the territorial distribution and settlement of the Hungarian industry). *Földr. Ért.*, No. 2.
Kóródi, J. (1970) *Változások Magyarország gazdasági térképén* (Changes on the economic map of Hungary). Kossuth Könyvkiadó, Budapest, 85.
Kóródi J. and Márton, G. (1968) *A magyar ipar területi kérdései* (The territorial problems of the Hungarian industry). Kossuth Könyvkiadó, Budapest, 176.
Lackó, M. (1960) *Gyári munkásságunk összetétele az ipari forradalom időszakában.* (The composition of the Hungarian working class in the period of the industrial revolution). Akadémiai Nyomda, Budapest, 595–625.
Lengyel, G. (1936) *La grande industrie hongroise.* Confédération des grandes industries de Hongrie. Budapest, 44.
Lettrich, E. (1965) Urbanizálódás Magyarországon (Urbanization in Hungary). *Földr. Tanulm.*, No. 5, 83.
Macartney, C. A. (1962) *Hungary—a Short History.* Edinburgh University Press.
Markos, Gy. (1949) *A magyar ipar száz éve* (The hundred years of the Hungarian industry). Studium, 112.
Markos, Gy. (1962) *Magyarország gazdasági földrajza* (The economic geography of Hungary). Közgazdasági és Jogi Könyvkiadó, Budapest, 582.
Markos, Gy. (1968) Wandlungen und Entwicklungstendenzen in der ungarischen Industrie. *Osteuropa-Wirtschaft*, Heft 1.
Markos, Gy. (1969) Grundsätze der territorialen Planung in Ungarn (In: "*Wissenschaftliche Abhandlungen der Geographischen Gesellschaft der DDR*").
Markos, Gy. (1971) *Ungarn; Land, Volk, Wirtschaft in Stichworten*, Verlag Ferdinand Hirt, 135.
Márkus, A. (1944) *Adalékok Budapest nagyvárosias kialakulásához 1880–1940 között* (The formation of Budapest as a metropolitan city, 1880–1940). Szfőv. Háziny., Budapest, 42.
Miklós, Gy. (1960) *Studies in Hungarian Geographical Sciences.* Akadémiai Kiadó, Budapest, 84.
Pécsi, M. and Sárfalvi, B. (1964) *The Geography of Hungary.* Corvina, Budapest, 300.
Prinz, Gy. (1914) *Budapest földrajza* (The geography of Budapest). M. Földrajzi Intézet, Budapest, 123.
Rézler, J. (1940) The Hungarian manufacturing industry. *The Hungarian Quarterly*, Budapest, 14.
Rézler, Gy. (1942) A magyar nagyipar fejlődése (The development of the Hungarian large-scale industry). *Orsz. Szociálpolitikai Int.*, Budapest, 36.
Ruisz, R. (1944) *Die Industrie in Ungarn.* Athenaeum, Budapest, 36.
Sándor, V. (1956) Die grossindustrielle Entwicklung in Ungarn 1867–1900. *Acta Historica Acad. Sci. Hung.*, Budapest, 139–247.
Sándor, V. (1964) Die Entfaltung der Grossmühlenindustrie in Budapest nach dem Ausgleich i. J. 1867. *Acta Historica Acad. Sci. Hung.*, 233–272.
Sárfalvi, B. (ed.) (1964) Applied Geography in Hungary. *Studies in Geography in Hungary*, Vol. 2, Akadémiai Kiadó, Budapest, 211.
Sinor, D. (1959) *History of Hungary.* Allen and Unwinn, London.
Stark, A. (1966) *A magyar ipar* (The Hungarian industry). Kossuth Könyvkiadó, Budapest, 278.

PART TWO

THE LABOUR ATTRACTION OF BUDAPEST

by

ERZSÉBET V. TAJTI

I. OBJECTIVES AND METHODS OF ANALYSIS

A high degree of concentration is characteristic of the distribution of non-agricultural, particularly industrial working places which has been shaped and developed by the interaction of natural and socio-geographical factors. The existence of favourable natural conditions such as power, raw materials, water transport routes and suitable building sites will promote the settlement of working places. The role of individual natural factors is modified by social factors, their significance varying through time.

In that phase of social evolution when industrialization began, working places were created alongside power and raw material resources and close to large consumer markets. When talking about the influence of social factors, we mean not so much the utilization of natural resources requiring expert knowledge, but rather adequate economic management, to further economic-political objectives and to coordinate production consumption and employment. There is constant interaction between these factors, the localization of working places presuming the existence of population.

The present paper intends to throw light on the location of working places in Budapest, and their influence on population growth, social stratification, population movements in the capital and labour attraction.

In the course of own investigations, we have started from the point that the economic character of an area is reflected in quantifiable similarities and differences in development, occupational conditions and other factors.

While the working places and living quarters of persons in non-agricultural occupation were in the same building, there could be no question of a clustering of working places. The separation of place of work from place of residence began and developed alongside industrialization. At present the localization of working places within a plant is so great that its manpower demands cannot be satisfied locally even though no other plant exists nearby. Yet by working place concentration we do not understand localization within a factory or plant but rather the industrial concentration of plants and other firms in an area, which create large manpower demands. Changes derived from a concentration of working places will also affect dwelling quarters and will result in labour absorption, migration of population, and occupational structure modifications.

The *distribution of population* and changes in the occupational structure can be examined from the point of view of either place of working or place of residence. Examples of both can be found in the literature (Ziegler, 1964).*

* By means of a representative survey Ziegler examined the dispersion of workers in large-scale factories in Munich according to residence.

Investigations according to the latter category are more frequent, however, as statistical administrative data are usually available according to place of residence.

Many researchers (Bencze, 1963; Berend and Ránki, 1955, 1961; Bora and Kóródi, 1959; Sándor, 1954) have discussed the concentration of working places in Budapest, and this part of the authors' work is thus based on the researches of other scholars. Similarly a number of authors (Acsádi, 1956; Bodor, 1954; Markos, 1962; Mendöl, 1942, 1963; Pápai, 1958; Szabady, 1962; Thirring, 1942) have discussed the numerical formation, and occupational structure of the population of both Budapest and the whole country. Few, however, have discussed commuting in the Hungarian literature (Bárány and Korbuczky, 1962; Zala, 1958; Lettrich, 1962). The author's own research covers the evolution of the commuting zone of Budapest and its systematic zonation, based on census data, various statistical surveys concerning the commuting-migration of industrial workers, and periodic reports published by the Hungarian Central Statistical Office. Use has also been made of information from the Central Office of the Hungarian State Railways, various railway stations, omnibus companies, and their agencies in both the city and suburbs.

TERMS USED IN THE STUDY

The term "agglomeration" is used in the sense of accumulation, density and concentration in reference to the number of inhabitants of a specific area. Population concentration is mainly characteristic of eities but in certain cases of non-city settlements as well.

The town and its immediate vicinity is an economic complex where the concentration of population, working places and residence is high. Differing in function but in close connection with each other, each part of the town has its own specific character. The internal pattern of an agglomeration, i.e. the distribution of working places and residences, is a matter for settlement-geography, and although this study deals with the growth of population number and changes in distribution, it cannot leave out of account the functional arrangement of the settlement. The functional belts within each agglomeration develop according to the specific local characteristics.

The development of functional belts depends also upon the type of agglomeration. Agglomerations may have one or more centres depending on the number of clusters forming the city, for instance, Greater London, Paris and Moscow, or upon the number of settlements in an industrial region which have coalesced, for instance, the Manchester conurbation, the West-Dutch towns, the Ruhr and Silesia. The large-scale concentration of industrial working places is characteristic of both kinds of agglomeration although the structure of industry is different. Agglomerations with several centres, corresponding to a "conurbation" have developed mostly in industrial regions based on natural resources, for instance, the Ruhr and Silesia, or at harbours receiving raw materials. Accordingly, among the economic functions industrial production prevails. Such industry is composed of branches of heavy industry

and branches processing raw materials in bulk. On the other hand, the functions of an agglomeration with one centre are manifold and typical of capital cities, for instance, Paris and Moscow. The primary city-forming factor is again industry although its structure is different. The industry associated with one-centre agglomerations is based on market factors, producing consumer's goods and labour-intensive industrial articles. Agglomerations with one centre may have a specific function, for instance, London and New York have their harbours, but normally their population attracting force is stronger, their functions more complex and their city-developing influences more accentuated. On the fringe of such large agglomerations newer rapidly developing cities come into being, and although their centres remain unchanged, the settlement structure is transformed.

Settlement belts develop most characteristically in agglomerations with one centre. The city centre contains the economic and cultural functions, the seat of administration and government, and other social institutions. Ministries, banking, company offices, wholesale warehouses, the stock-exchange and specialized retail shops are found here. The non-producing working places are concentrated in the city.

The centre is surrounded by a belt, mainly residential in character but still full of offices and smaller plants. An external working place belt characterized by the predominance of industrial plants joins on to the inner residential zone, while an outer residential belt encircles the whole city extending beyond the administrative boundaries to form the commuter zone proper.

Before dealing with the commuter zone in detail let us examine population clusters and the meaning of the various terms. The distribution of population is not a stationary but a dynamic process. Strong migration is characteristic of economically developed countries but even more so in those with a fast developing population. The population of certain areas may decrease, sometimes despite high natural increase, to such an extent that smaller communities may lose their independence and be joined to other communities. In other places population growth exceeds the natural growth increment, and adjoining settlements are amalgamated. According to the economic character of the area, outward or inward migration may be generated. People migrate from agriculturing areas, looking for jobs in industrially developing parts, which results in the agglomeration of the population. Agglomeration is the result of two entirely different processes, namely the influx of population into towns, and the amalgamation of neighbouring settlements. The cause of the two processes producing population agglomeration is the concentration of working places, causing successively either population attraction or areal expansion or both, depending upon the factors prohibiting further development owing to the increased number of working places. Should further development be impeded by insufficient influx or should there be no areas in the town suitable for further building, areal expansion will occur. On the other hand, if neither the extent of settlement nor the existing area is adequate for further development, population influx and areal expansion or both together will materialize.

Large centres of population agglomeration are characterized by intense and variable population influx. Migration induced by the labour attractive-

ness of cities with developing industry, trade, communication, administrative and other functions takes on two forms, i.e. *resettlement* or *commuting*.

We can speak of *resettlement* when a worker migrates with his whole family to a settlement where his working place is.

Commuting is the daily movement of the worker between his place of residence and place of work. The movement between the two places may take place within a settlement; between settlements; and between one part of the country and another, and between countries. In a narrower sense we can speak of *commuting* only *when the place of work and place of residence are situated in settlements under different administrations.* It is important to emphasize this, because commuting within a settlement or across the boundaries of a country cannot be regarded as real. However extensive a settlement forming one administrative unit, communication facilities are different. On the other hand, the latter is a transitional form always connected with the living quarters in the place of work. Should resettlement be prevented for some subjective or objective reason the worker will only move into quarters near his working place, for instance into a workers' hostel, or rented room, and go home to his permanent residence at fairly wide intervals, i.e. weekly, monthly and in case of commuting between countries even less frequently, to see his family. This form is most frequent in the younger age groups, workers with families regarding it as a transitional arrangement, as either the family moves to the wage-earner or he accepts work in his original place of residence.

It occurs frequently that the members of the family do not move to the working place but to a nearby settlement, from where they can commute daily to the place of work.

The two forms have different effects on the development of agglomerations. The main difference between the territorial distribution of working places and that of the active population lies in the fact that the industrial, commercial and administrative working places are mainly localized, while the active population is highly dispersed. This difference, however, decreases with internal migration, because the territorial distribution of active population tends to conform to the distribution of working places. The above-mentioned disproportions decrease with commuting as labour shortage in the working place and labour surplus in the surrounding area are equalized.

The population of the settlement of place of work increases by the removal of the worker and his dependants, who form a manpower reserve. In both the town and commuter zone the growing manpower reserve provides possibilities for the further development of existing working places and the establishment of new ones. Therefore labour attraction affects the structure of settlements in two ways:

(*a*) With resettlement, the population agglomerates within the administrative boundaries of the town, causing congestion in institutions and other functions.

(*b*) Commuting results in a distribution of population permitting the expansion of institutions and functions within the town. Commuting contributes to the expansion of residential quarters beyond the administrative boundaries, and a settlement belt which helps the expansion of urban functions, will expand to encircle the city. This belt stands apart from both the town

Fig. 1. The environment of Budapest
1 = inhabited area; 2 = railway lines; 3 = main roads; 4 = roads

and rural area being lightly built and provided with hardly any public utilities.

Finally, the author must emphasize that the term "settlement" always refers to an administrative unit. While open to many objections, this definition must be adopted as all the data used in this analysis have been derived from administrative records (Fig. 1).

II. THE BUDAPEST AGGLOMERATION

The only large city in Hungary is Budapest which similar to London, Paris, Moscow and Vienna, is a one-centre agglomeration, whose development was due to capitalist industrialization. In the second half of the last century Budapest exercised an exceptionally strong gravitational pull on the new economic branches. As a result, a considerable proportion of industry settled in Budapest and an increasingly important part of the country's population migrated here.

1. FACTORS RESPONSIBLE FOR THE GROWTH OF THE BUDAPEST AGGLOMERATION

The growth of the city has been influenced by very favourable natural factors. Budapest is situated on both banks of the Danube, where the river emerges from the Hungarian Central Mountains into the Lowlands. Here a gently sloping has been deposited into which the river has incised itself producing a relatively narrow bed remarkably free from flooding. The narrow riverbed provides a very good crossing place, the like of which cannot be found further south, as well as cheap water transport and abundant industrial water. The geographical position of Budapest is favourable because it lies at the junction of the north-east trending Hungarian Central Mountains, which abound in mineral resources, and the Great Plain. Owing to its situation, it was almost inevitable that Budapest would become the centre for regions of different character.

More important than these, however, are the social factors which in the course of history had intimately affected the development of the city.

The great social changes in Europe during the 18th century reached Hungary by 1800 when the growth of capitalism went side by side with national aspirations for independence. The progressive forces of the country endeavoured to develop Budapest into an economic, commercial and cultural centre. The realization of these efforts met with considerable difficulties. The development of the city was hampered by the general backwardness of the whole country, in those times still agrarian, the privileged system of the nobility, and the dependence on Austria, which became crippling particularly after the defeat of the bourgeois revolution of 1848–1849. The realization of the reform measures elaborated earlier under Kossuth and Széchenyi was restricted to a minimum. The situation improved somewhat after the "Compromise" of 1867 when the country began to enjoy moderate economic prosperity.

By virtue of the Compromise Hungary obtained greater independence than before the revolution but foreign, military and financial affairs continued to remain under common Austro-Hungarian control. The influx of Austrian capital was permitted, and the developing banking and commercial organization in Budapest and Vienna were linked. The national aspirations for independence generated the desire to develop Budapest as a separate Hungarian political, cultural, economic and commercial centre to counterbalance the central position of Vienna in the monarchy. This aim was to be achieved by the construction of a centralized road and rail system, state subsidies supporting the establishment of industrial plants and banking institutions, and the creation of commercial enterprises, administrative and legal organs (ministries), and cultural, scientific and health institutions. The establishment of hospitals and medicinal baths for the exploitation of natural medicinal waters was also effected. Budapest, in a relatively short time and during the period of Austro-Hungarian Monarchy thus became a great city, and the centre of the country.

From 1880 onwards the population rapidly expanded a reaction to industrialization and general construction. *The specific attractive power of Budapest derived from it being not only the political, administrative, communicative, cultural and commercial capital of the country but also a developed industrial centre.*

During the 18th century three independent settlements of much the same size but with differing functions existed where Budapest is today. By 1800 the inhabitants of the three combined amounted to 54,000. The administrative centre of the country was in Buda, on Várhegy (Castle Hill), while Pest built on the flat lefthand side of the Danube was one of the most important commercial and industrial centres. Óbuda situated somewhat to the north had a predominantly agricultural character (Fig. 2).

The population of Budapest rose rapidly in the second half of the last century. After the War of Independence Buda and Óbuda were united, but it was not till 1873 that Buda and Pest were administratively joined to form the capital—Budapest.

City development was determined by the clustering of working places, for instance, state offices, trade and cultural institutions within the city centre; only barracks, hospitals and warehouses were exceptions to this. Industrial plants settled on the—then—outer fringe of the city. The population resided close to the working places in which it was employed. The differentiation of places of work influenced the development of the city. The inner parts became relatively quickly built-up, the expansion taking place in a vertical direction owing to a shortage of land. On the other hand, in the urban fringe ribbon growth along the lines of communication was characteristic of the workers' settlements associated with the expanding industrial districts.

It is characteristic of city development that the protrusions of Budapest expanding along the Danube and railway lines had not yet reached the administrative boundaries, before *residential quarters grew up outside the city boundaries*. Less expensive sites, lower rents and cheaper foodstuffs attracted the ever growing masses of prospective workers in the capital to these areas. At astonishing speed settlements came into existence adjoining already

developing villages which were partly reorganized. The development of these settlements and the transformation and differentiation of their economic character began only in the fourth quarter of the last century and assumed growth dimensions similar to Budapest by the turn of the century.

The concentration of the industry in Budapest played a decisive role in the expansion of both its inner area and its suburbs.

Fig. 2. Built-up areas in Budapest
1 = before 1700; 2 = between 1700 and 1860; 3 = between 1860 and 1900; 4 = between 1900 and 1920; 5 = between 1920 and 1949; 6 = after 1949

2. THE DEVELOPMENT OF INDUSTRY IN BUDAPEST

The manufacturing industry of Budapest is of varied composition, practically all the branches existing in the country being found here. As is general, those branches have been most successful which employ skilled manpower and depend on technological research. The presence of power, e.g. electrochemicals and electrometallurgy, and raw-materials oriented, e.g. iron and

steel and metal production, heavy chemicals and heavy engineering branches, is likewise typical of the industry of Budapest.

On the basis of numbers employed the engineering industry ranks *first* and is highly varied in composition. Textiles come *second* and are also a highly varied branch. Food production which played such an important role in the initial stage of industrialization occupies *third place* (Fig. 3).

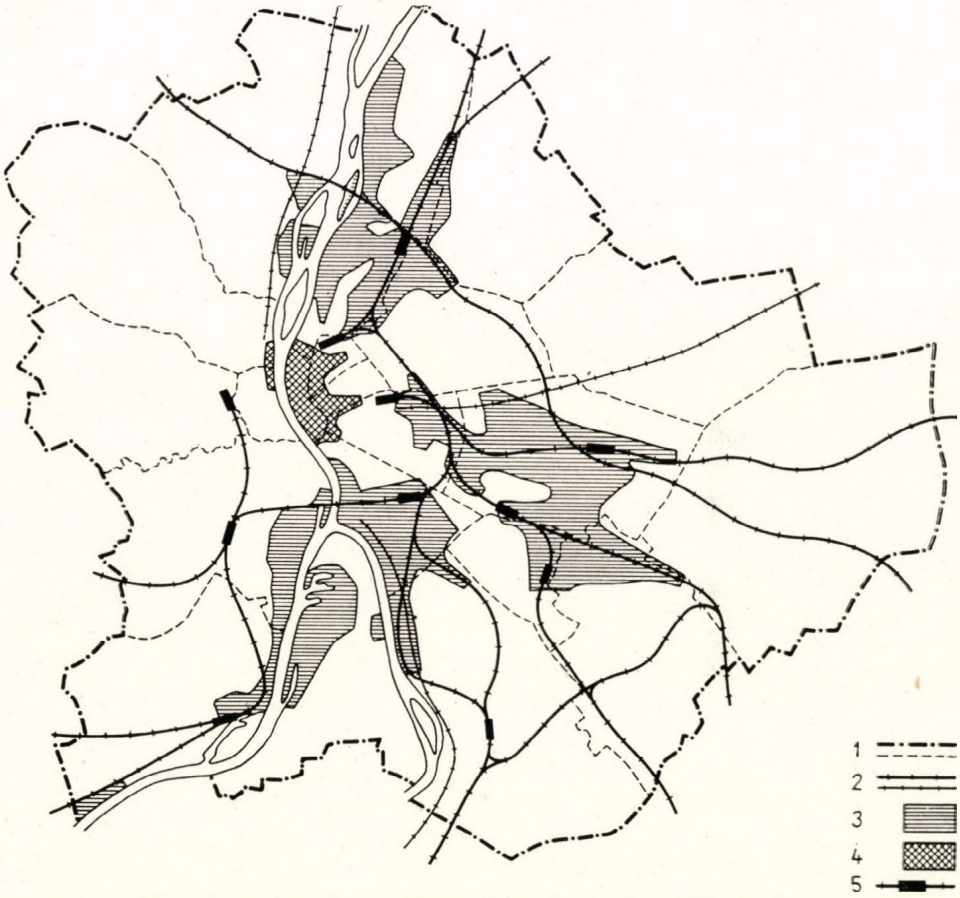


Fig. 3. Areas of working place character in Budapest (after I. Bencze)
1 = boundaries of administrative districts; 2 = railway lines and stations; 3 = industrial areas; 4 = office zone (central business district); 5 = railway stations

The industrial plants of Budapest have been established along the waterway of the Danube, the proportion of these located within a distance of 1 km of the river being remarkably high. In the early stages a considerable role was played by steam-mills while engineering production was started to aid the flour industry. With the building of railway lines further industrial expan-

sion followed, and large-scale factories, for instance, metal and engineering works, chemical plants and tanneries had been established in the outskirts of Budapest near freight-yards by the last two decades of the last century. During this rapid growth of the city factories were crammed in between dwelling houses, and were thus restricted in further development. The period of rapid industrial expansion in Hungary began at the end of the 19th century. Thus, from 365 in 1890 the number of plants employing more than 20 had risen to 1296 by 1910, most of them being located in Budapest. The total number of industrial workers in the country approached one million by 1910, of whom 186,000 worked in the capital, mainly in the manufacturing sector. At the same time, about 28 per cent of all industrial goods were produced in Budapest.

Manufacturing in Budapest expanded in three directions along the main communication routes, namely north and south along the Danube and along the railway to the east. These directions were maintained when industrial expansion extended into the suburbs.

The industrialization of the suburbs began in the last decade of the last century and thereafter assumed vast proportions, particularly in the period between the two world wars. The boom before and during the First World War resulted in rapid industrial progress although there were subsequently considerable set-backs.

After the First World War production growth in Greater Budapest was hindered by reduced frontiers and changed economic circumstances that followed. The territory of Hungary was reduced by two-thirds, and the population by about 60 per cent. The new situation naturally affected the development of the capital. About 50 per cent of industrial employees, 49 per cent of the factories and 56 per cent of production value remained in the country. The proportion accruing to Budapest, however, in total national production increased owing to the loss of industrial centres in Slovakia and Transylvania, manufacturing production in the capital rising from 28 to 50 per cent of the national total. Budapest remained the only centre of large-scale industry and owing to reduced distances and loss of centres its pull on the rest of the country was strengthened. Because of the centralized routes and railway system and the construction of the Free Harbour at Csepel, Budapest became the most important distribution node not only of local but also of imported raw materials.

Between the two world wars the course and character of production growth was determined by international economic conditions. In the 1920's development was slow. The change-over to peace-time production met with considerable difficulties and by 1926 the engineering works in Budapest were still producing but 49 per cent of their 1913 output. The food and building materials industries suffered owing to the crisis. The situation in the mills producing for export deteriorated after the disintegration of the monarchy, owing to the loss of their western market in Austria.

Notwithstanding the difficulties, new industrial branches came into being in the years after 1920, the collapse of the Monarchy having a favourable influence on light industry and the labour-intensive precision machines and instruments industry. Jointly with the growth of textile works, the increase

in the number of precision machines and telecommunications factories was considerable. The precision machine and instrument manufacturers located themselves in the inner industrial zone, mainly in Buda, while a considerable part of light industry went to the suburbs. At Csepel a clothing mill and fur factory, and in the industrialized suburbs of South-Buda and North-Pest new textile works were founded, while the large factories in the northern suburbs of Újpest and Rákospalota, in the south in Kispest and Csepel have not only maintained but strengthened their earlier position.

In the industrial expansion on Csepel heavy industry preserved its leading position, though the newly established light industrial plants ended its monopoly. Heavy industrial plants utilizing modern technology were leading even in peace-time production, the establishment of a crude-oil refinery adding to their weight. The building of the Free Port further promoted the favourable position of industry in Budapest, especially in Csepel, during the inter-war period.

Manufacturing in the suburbs of South-Pest was completely altered. In the 1920s textile-mills were founded while the earlier existing plants were further enlarged. By establishing new plants the predominantly food production character of the suburbs of South-Buda was likewise transformed.

In the inner industrial areas, the engineering branch continued to lead. The large engineering works further expanded their old plants, but also new affiliates were established. New large-scale plants were established in the labour-intensive instrument and telecommunications industry in the youngest—South-Buda—industrial district. The expansion of textile production was evidenced not by the establishment of new factories but by the enlargement of existing ones.

The end of the interwar period was characterized by a wartime economy. New plants producing mainly armaments were established in the suburbs, and elsewhere. By 1939, 43 per cent of the total industrial capacity of the country was located in Greater Budapest, in which 55 per cent of those in manufacturing were employed.

The events of the Second World War inflicted heavy losses on industry. In the years after 1945 the first task was the reconstruction of war damage and the introduction of a planned economy. After nationalization a large number of small factories working with obsolete machinery and technology were either closed or amalgamated. With the industrialization of the provincial towns, the exaggerated industrial weight of Budapest decreased slightly, its share in industrial production dropping from 59·6 per cent in 1949 to 51·8 in 1959 and the number of workers similarly falling from 53·8 to 45 per cent, although at the same time, exercising a tremendous pull on the provinces, the absolute number of workers increased by more than 100,000. The growth in the number of workers was due to the rise in the volume of labour-intensive production, made possible by the migration to Budapest. Thus a considerable proportion of the 300,000 workers was made redundant because of the mechanization of agriculture.

3. COMMUNICATIONS AND AGGLOMERATION

The evolution of a modern industry, and the rapid and regular transfer of population and commodities from one place to another are inconceivable without a highly developed transport system and good communication facilities. The concentration of industry in Budapest and the development of Budapest into a great city were enhanced by both the national and local transport networks.

The beginning of the building of the Hungarian railway network coincided with the development of commodity production and economic independence. The first comprehensive project was drawn up by German economists, according to which the railway network of the country was to be a component part of the Austrian system. This project was repudiated by the progressive leaders of the Reform Age, and Budapest, at that time still undeveloped, was designated as the centre of the transport network. The building of railway lines began in 1846. During the political suppression following the defeat of the War of Independence construction proceeded slowly but took a more rapid course after the Compromise and the organization of MÁV, the Hungarian State Railway Company. By the end of the century all the main railway lines were in existence.

The importance of navigation on the Danube decreased proportionately with the building of the railway system, and by 1920 its share in goods transport had dropped to 10 per cent, which, however, increased slightly later. River passenger traffic has always been insignificant, even though Budapest is the busiest harbour of the country.

After the First World War road building made headway, the starting point of new highways which followed the track of the old main roads likewise being Budapest.

After the Second World War the national airport built in Budapest has become an important node in the international air line system.

The building of railway lines, and the construction of freight-yards had a favourable effect on the location of industry. The North-Pest industrial district was most favoured from the point of view of transport and as such grew at the fastest rate. The southern freight-yard on the Danube was built in the 1880s and by improving the traffic situation in the South-Pest industrial district provided an incentive for industrial expansion.

The suburban railway lines constructed in the 1890's improved the traffic situation considerably, and by the beginning of the 20th century had been linked with the national railway network. Thus via the Ráckeve, Gödöllő and Szentendre suburban lines nearly 70 factories of various types had been connected with the national system.

4. THE DEVELOPMENT OF THE SUBURBS

Many of the migrants to Budapest settled in suburbs near to the capital on account of shortage of accommodation and high rents. The subdivision of estates near the capital into small plots likewise furthered the settlement of popu-

lation. Workers' settlements sprang up along the main communication routes in the neighbourhood of the capital, their population working predominantly in factories in Budapest. Only Csepel encircled by the Danube, and Budafok which had its own food industry, were immune from this process of commuting. At the end of the century about 10,000 persons were regularly working in Budapest who lived in other settlements. Production in the suburbs was at that time still undeveloped and on a very small scale, the number of workers exceeding 100 in about 10 plants only. Compared with the 65,000 workers in large factories in Budapest, the 4000 in similar establishments in the suburbs was insignificant. The industrialization of the suburbs began in the last decade of the last century when transport facilities became available. Cheaper sites similarly attracted industry.

All the advantages for the establishment of factories in Budapest due to developing communications, central situation, good marketing facilities, skilled manpower, direct contact with business life and offices were equally enjoyed by the suburbs.

Industrialization did not start at the same time everywhere nor did it develop at the same pace. At the end of the century the North-Pest suburbs led in industrialization but in the years following 1910 the South-Pest suburbs started to gain ground. Increasingly new industrial factories were established in the suburbs for health and organizational reasons while the establishment of new plants in the inner city was prohibited. The southern fringe of the city and its suburbs were designated for new settlement development which contributed to the rapid growth of the southern fringe.

After the end of the century the number of industrial population in the suburbs increased more rapidly than the population as a whole. Thus, while between 1900 and 1910 the total number of inhabitants rose by 74 per cent, the industrial population increased by 112 per cent. With industrialization although the absolute number of commuters rose, namely to 8 per cent of the working force by 1910, about 14,000, the proportion of workers commuting to the capital decreased. Most workers came, as before, from the southern suburbs to the capital, although the proportion of those working locally or in neighbouring Csepel had grown. Concerning the workers of the northern suburbs of Újpest and Rákospalota about 70 per cent were employed locally or in neighbouring plants.

Compared with the 4000 of 1900, by 1910 more than 40,000 workers were employed in suburban factories. Again at the end of the century small-scale industry was still prevalent but by 1910 two-thirds of industrial wage earners were engaged in manufacturing. Indeed, on the basis of the number of workers employed the suburbs became after Budapest the largest industrial area in Hungary. Outside the central area the most industrialized regions were Counties Nógrád, Borsod, Hunyad (Hunedoara), Krassó-Szörény (Caraş-Severin) and Pozsony (Bratislava). Újpest employing nearly 6500 factory workers was after Budapest, Pozsony and Temesvár (Timişoara) the fourth largest industrial town in Hungary. A large degree of plant-concentration was typical of suburban industry, seven large factories employing 52·2 per cent of the working force. By comparison with most units in Budapest which were small, in the developing suburban industrial zone there was a large number. Some

very large factories existed such as "Egyesült Izzó", established in 1900 in Újpest which in 1906 employed more than 3000 persons. The largest pharmaceutical works in Hungary, namely Chinoin, was likewise established in Újpest in 1911. The Tractor Works in Kispest was founded in 1900 and in 1912, after being amalgamated with other engineering plants, gave employment to 2000 workers. The character of Csepel was determined by the heavy industry established before the end of the century. These works had been constantly enlarged and the number of workers employed grew from 2000 in 1900 to 22,000 in 1961.

During the First World War industry steadily developed, and a large number of new industrial plants sprang up in both Budapest and the suburban belt. The number of workers also increased.

The war-time inflation was followed by a large-scale retrenchment, when the number of industrial plants was considerably reduced. Nevertheless the number of workers in the factories in the Budapest suburban belt was 50 per cent higher than in 1910.

The post-war changes in the country also affected the development of the suburbs. The population increased rapidly, slum-like settlements mushroomed while the number of migrants to Budapest was increased by the frontier realignments. Although the economic situation improved very slowly, new trends in industrial development gained ground in the textile and precision machines, telecommunications and instrument sectors after 1920.

Between 1920 and 1930 an exceptional shift took place in industrial structure, with the proportion of light industry rising in all suburbs but most conspicuously in South-Pest where that sector became dominant.

Although the economic crisis of the early 1930s affected Hungary, the population of the suburbs continued to increase, more and more people migrated from the congested areas of the city into the cheaper and healthier suburbs. For health reasons many settled in residential areas, in the east or in Buda, far from the industrialized suburbs and at this time several garden-city quarters came into existence.

The prosperous economic conditions of the Second World War gave a new impetus to the industrialization of the suburbs though associated not so much with the establishment of new plants, as with production increase and higher productivity. The new plants manufactured either commodities missing the market on account of import restrictions, for instance, lacquers, cotton, wool, and alcohol, or pursued war industrial production. The heavy industrial plants of Csepel were enlarged for armaments manufacture and in 1940 employed more than 20,000 workers.

As a result of a change over to military production the number of workers in the suburban plants doubled, reaching 70,000 by 1940, i.e. about half of all industrial employees in the capital, compared with less than one-third a decade earlier.

The residential settlements in the suburbs extended over a greater area than the industrial quarters and many workers from the ever-widening residential belt commuted to Budapest or to other suburbs.

In the suburbs of Rákos not a single factory of considerable size existed. The residential character of the eastern and South-Pest suburbs was accentuated.

Both had been agricultural settlements and between the two world wars developed into garden-cities.

It is characteristic that the population increased earlier and more rapidly in the industrial suburbs and in those adjacent to the main railway routes. Vacant plots alongside factories were built-in quickly, and expansion continually obtained fresh impetus with the new development of communications.

On the threshold of the Second World War the outer industrial zone of Budapest—and the majority of residential settlements—became economically and organizationally attached to Budapest. They were only united administratively, however, with Budapest in 1949, when 7 towns and 16 communities were annexed to the capital.

The industry of Budapest and its suburbs continued to progress. The employment pull of the city strengthened and migration further increased. The rate of growth of the suburban population accelerated during the war owing to evacuations from Budapest to Buda and Rákos. At the same time a new settlement belt began to develop around the suburban zone. The more distant settlements with good transport facilities grew in importance as the industrial districts in Budapest expanded and as the housing situation deteriorated. These settlements now constitute a significant zone of labour attraction and in development, at least those contiguous with them, resemble the suburbs.

III. POPULATION CONCENTRATION AS A RESULT OF THE ATTRACTION OF LABOUR TO GREATER BUDAPEST

In terms of distribution, the population of Hungary is rather unbalanced, nearly one-fifth of which is concentrated in Budapest (Table I).

The difference in size of Budapest and the second largest city—Miskolc—is enormous, namely 2 million as compared with 173,000 in the latter.

The distribution of population in Hungary indicates that Budapest is the outstanding centre among Hungarian towns. The dominance of Budapest is shown by the fact that the attraction of labour to it is together with migration to other towns the main force in the redistribution of the population.

1. MIGRATION TO BUDAPEST

The rapidly developing industry in the second half of the last century, resulted in considerable migration to Budapest from all parts of the country,

TABLE I

Population change between 1900 and 1970 for Greater Budapest, other towns and communes

Date	Population							
	Hungary		Budapest		Towns		Communes	
	total	per cent	total	per cent	total	per cent	total	per cent
1900* Dec. 31	6,854,415	100·0	861,434	12·6	1,317,529	19·2	4,657,452	68·2
1910* Dec. 31	7,612,114	100·0	1,110,439	14·6	1,478,751	19·5	5,013,924	65·9
1920 Dec. 31	7,986,875	100·0	1,232,008	15·4	1,588,386	19·9	5,166,481	64·7
1930 Dec. 31	8,685,109	100·0	1,441,601	16·6	1,701,545	19·6	5,541,963	63·8
1941 Jan. 31	9,316,074	100·0	1,712,451	18·4	1,851,928	19·9	5,751,695	61·7
1949 Jan. 1	9,204,799	100·0	1,590,316	17·3	1,773,916	19·2	5,840,567	63·5
1960 Jan. 1	9,976,530	100·0	1,804,299	18·1	2,155,362	21·6	6,013,869	60·3
1970** Jan. 1	10,352,597	100·0	1,940,212	18·8	2,654,721	25·7	5,720,664	55·5

* Data calculated for the territory of Hungary after 1920

** According to the Census 1 January 1970 (preliminary data)

the characteristics of which vary through time and from place to place. In-migration to Budapest was most considerable from near-by places and from the over-populated agricultural regions, namely from counties Pest, Fejér, Szolnok and Heves. Before the end of the century the immigration of foreign workers from Austria, Slovakia and Germany and of their dependents was also appreciable. After World War I in-migration from the Transdanubian counties and from places near to Budapest remained high, due to the fact that the great landowners in Transdanubia changed over to capitalist farming. As a consequence farmers who hired land, as well as farm hands, lost employment, increasing the number of unemployed landless peasants. From Transdanubia the emigration of workers to foreign countries was considerable. Movement from the territories lost after World War I was extensive and was estimated to have involved more than 100,000 persons. The inflow was largely to Budapest and its surroundings and comprised mainly employees in county and community administration, the railways and the post office.

Between 1920 and 1930 outmigration from the regions beyond the Tisza river became more considerable. Migration to Budapest itself decreased but the flow to the suburbs steadily rose. The population of the suburbs of Pest increased by 44·2 per cent during this time, the proportion of those coming from beyond the Tisza being 8 per cent higher than earlier. Out-migration was characteristic of the agricultural provinces and also of towns such as Hódmezővásárhely and Debrecen. Territorially it was highest from the north-eastern regions of high population density, and from counties Békés, Szolnok and Pest.

Migration to Budapest continued steadily. There were periods when it was particularly high, for instance, at the end of the last century following the completion of river regulation and railway construction, after the First World War when ex-servicemen were looking for work, during the 1930's when landless agricultural workers flooded into the towns and—since 1949—further agricultural manpower has been released from the land owing to the socialist transformation of the rural economy.

2. THE GROWTH AND TERRITORIAL DISTRIBUTION OF POPULATION IN BUDAPEST

The distribution of population in the two parts of the city, namely, Buda and Pest, is different. In the 18th century Buda was more populated, its population being three times larger than that of Pest in 1720. On the other hand, at the beginning of the 19th century Pest was the larger (Table II). While the population of Buda grew gradually, that of Pest increased by leaps and bounds, soon surpassing that of Buda. Public institutions, offices, banks, shops settled in Pest, and the political, cultural and administrative centre of the country shifted there also.

In 1880 the population of Pest exceeded that of Buda by more than three times. The proportion of the total population residing in Pest grew up till the end of the century after which it slowly decreased. This may be ex-

TABLE I

Growth of population in Budapest

Year	Buda		Pest		Total number of population
	number	per cent	number	per cent	
1720	9,600	78·7	2,600	21·3	12,200
1780	21,665	61·5	13,550	38·5	35,215
1799	24,306	44·9	29,870	55·1	54,176
1820	33,281	42·3	45,318	57·7	78,599
1850	48 334	33·7	94 955	66·3	143,289
1869	74,500	26·3	205,849	73·7	280,349
1880	81,212	21·9	289,555	78·1	370,767
1890	99,511	18·5	434,489	81·5	534,000
1900	125,813	17·2	607,545	82·8	733,358
1910	162,342	18·4	718,029	81·6	880,371
1920	196,478	21·1	732,518	78·9	928,996
1930	228,461	22·8	777,723	77·2	1,006,184
1941	280,731	24·0	884,232	76·0	1,164,963
1949	287,039	27·5	770,879	72·5	1,057,918
1960	359,974	29·1	840,367	70·9	1,200,341
1970*	420,000	34·0	860,000	66·0	1,280,000

* According to the Census 1 January 1970 (preliminary data)

plained by the fact that the old administrative area of Pest became congested. On the other hand, in Buda, where building conditions were less favourable, more sites were available. Population increase on the Pest side

TABLE III

Distribution of population in the central and suburban areas of Budapest (in percentage)

Year	Buda			Pest			Budapest		
	1	2	3	1	2	3	1	2	3
1869	23·9	2·3	26·2	66·0	7·8	73·8	89·9	10·1	100
1880	19·6	2·2	21·8	70·2	8·0	78·2	89·8	10·2	100
1890	17·2	2·0	19·2	70·3	10·5	80·8	87·5	12·5	100
1900	14·5	1·7	16·2	70·6	13·2	83·8	85·1	14·9	100
1910	14·6	2·0	16·6	64·7	18·7	83·4	79·3	20·7	100
1920	15·9	2·3	18·2	59·6	22·2	81·8	75·5	24·5	100
1930	15·8	3·2	19·0	54·1	26·9	81·0	69·9	30·1	100
1941	15·1	4·7	19·8	52·7	27·5	80·2	67·8	32·2	100
1949	18·0	4·1	22·1	48·5	29·4	77·9	66·5	33·5	100
1960	19·8	4·0	23·8	46·5	29·7	76·2	66·3	33·7	100
1970*	19·6	5·9	25·5	44·3	30·2	74·5	63·9	36·1	100

1 = centre, 2 = suburbs, 3 = total

* Estimated value

was thus diverted to suburban settlements outside its administrative boundary (Fig. 4).

In 1869 it was characteristic of *Greater Budapest* that the majority of population was still concentrated in the *central core*. This distribution slowly changed after the turn of the century, the clustering effect of the suburbs having a greater weight. There were considerable differences in terms of population distribution between the suburbs and central cores of Buda and Pest (Table III).

In 1869 the population of the suburbs numbered no more than 31,500, hardly more than one tenth of the total population of Budapest. The growth of the suburbs was slow up to 1900 with the exception of Újpest.

Between 1900 and 1910 the population in the South-Pest suburbs (Pesterzsébet and Kispest) increased by 40,000. By the end of the next decade these territories had become the most populated of the fringe areas (Table IV).

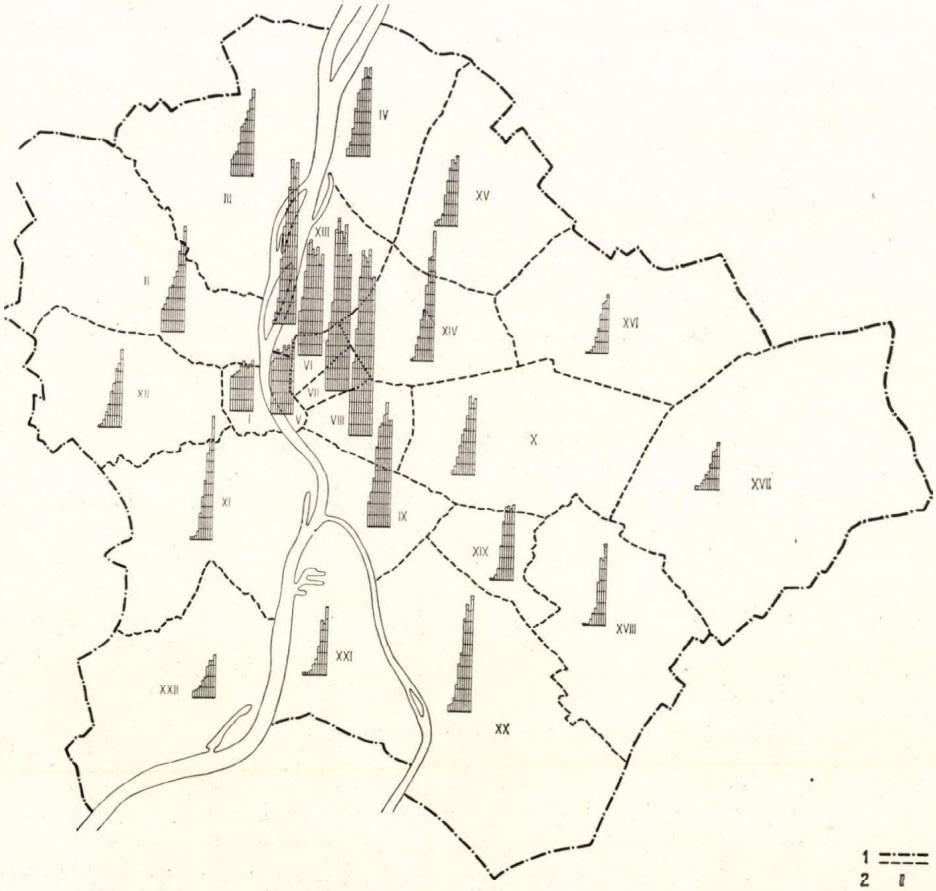


Fig. 4. The growth of population according to districts, from 1869 to 1960
1 = boundaries of districts; 2 = 10,000 persons

TABLE IV

Population change in the suburbs of Budapest between 1830 and 1970***

Suburbs*	1830	1869	1880	1890	1900
North-Pest	1,627	10,180	15,773	29,785	53,602
East-Pest	1,005	1,519	1,671	2,555	6,240
Rákos	2,646	3,924	4,301	5,135	9,159
South-Pest	4,330	5,738	9,157	20,532	40,627
Csepel	599	1,329	1,526	2,246	4,568
South-Buda	4,485	6,805	7,418	8,933	11,542
North-Buda	1,843	2,093	2,421	2,793	3,588
Total	16,535	31,588	42,267	71,979	129,326

* The suburbs in North-Pest comprise Újpest and Rákospalota–Pestújhely (Districts 4 and 15)
The suburbs in East-Pest comprise Mátyásföld–Sashalom–Cinkota–Rákosszentmihály (District 16)
The suburbs in Rákos comprise Rákoskeresztúr, Rákoshegy–Rákosliget–Rákoscsaba (District 17)
The suburbs in South-Pest comprise Pestlőrinc, Pestimre, Kispest, Pesterzsébet–Soroksár (Districts 18, 19 and 20)
The suburb Csepel (District 21)
The suburbs in South-Buda comprise Albertfalva, Budatétény, Nagytétény–Budafok (District 22)
The suburbs in North-Buda comprise Pesthidegkút, Békásmegyer–Csillaghegy (part of Districts 2 and 3)
** Estimated value
*** Compiled on the basis of data concerning the independent administrative units before 1949

Population attraction varied from suburb to suburb. Nearly 30 per cent of the total population lives in the suburbs of Pest, due to their functional character. In Buda and its suburbs residential quarters were built along the Danube, while in the north and south, industrial working places predominate, and in the inner core area offices and business quarters. Large areas of the suburbs are occupied by villas and residential houses with gardens.

The development of the suburbs—as with the inner core—is likewise different on either side of the Danube. Suburbs are less important in Buda than in Pest. The suburban population of Buda amounts to 15·1 per cent of the total population of Buda, while that of Pest is greater, 40·5 per cent. The changing share of the suburbs in the overall population of Budapest is given in Tables V and VI.

From the population number of certain districts it appears that settlement was periodic. The population of the inner zone increased till the end of the century, after which it was either stationary or decreased, district 2 with the addition of Pesthidegkút and the industrializing district 11 being exceptions. A rapid rise in population is shown in district 13 which forms the industrial quarter of North-Pest and at the same time one of the most

1910	1920	1930	1941	1949	1960	1970**
85,184	99,436	121,714	136,770	126,903	139,808	141,144
14,183	21,821	34,597	44,310	45,684	53,314	61,062
14,391	16,312	23,049	34,882	35,763	42,134	49,758
82,351	119,639	186,639	220,875	211,264	236,488	262,744
9,752	14,075	23,805	47,812	46,621	59,963	71,129
16,056	19,814	30,228	38,128	38,254	44,774	40,494
5,676	7,674	14,537	31,472	22,976	27,784	33,669
227,593	298,771	434,569	544,249	527,465	604,265	660,000

populated districts of Budapest. The process was similar in district 14 as well. Among the former suburbs the greatest population is clustered in the districts belonging to the industrial belt, districts of residential character being decidedly smaller.

The 1970 census data indicate that the population features characteristic of agglomeration are becoming increasingly distinct. During the last ten years the population in the central districts of Budapest has decreased by 20,000, although the city still remains the most densely populated region of the country.

Between 20 and 25 per cent of the workers of Budapest were commuting from the suburbs and the provinces to the zone of labour attraction before the Second World War. This zone expanded as industrialization spread to the suburbs. The splitting up of land began in the settlements situated close to the suburbs and assumed great proportions between 1920 and 1930 when it induced large-scale population growth. This development began first in north Budapest, and several new settlements came into existence, such being Alag, Alsógöd, Felsőgöd, Sződliget, which formed an uninterrupted chain along the Danube as far as Vác, springing up alongside the existing rural settlements. A similar process can be observed nowadays in settlements adjacent to the suburbs of the southern industrial region.

Unprecedented changes have occurred in the settlements close to Greater Budapest. Since 1949 more than 25,000 persons have migrated into Greater Budapest annually, more than double the number of migrants. Many of those migrating from Budapest do not leave the population cluster altogether, but move only to one of the nearby settlements. Owing to housing problems the population-absorbing capacity of Budapest is limited, and a considerable number of those accepting employment in Budapest are compelled to migrate to the settlements within the commuter zone. Thus in-migration plays an important role in the population growth of this zone as well. Among

TABLE V

The changing distribution of population among the suburbs of Budapest, between 1830 and 1970 (in per cent)

Suburbs	1830	1869	1880	1890	1900	1910	1920	1930	1941	1949	1960	1970
North-Pest	9·8	32·3	37·3	41·4	41·4	37·5	33·3	28·1	25·0	23·9	23·1	21·3
East-Pest	6·1	4·8	4·0	3·4	4·8	6·2	7·5	7·7	8·0	8·5	8·8	9·2
Rákos	16·0	12·7	10·2	7·1	7·1	6·3	5·4	5·3	6·6	6·7	7·0	7·5
South-Pest	26·2	18·2	21·7	28·5	31·4	35·9	39·6	42·8	40·1	39·8	39·1	39·9
Csepel	3·6	4·2	3·9	3·1	3·5	4·0	4·5	5·3	8·6	8·5	9·9	10·8
South-Buda	27·1	21·2	17·6	12·6	8·9	7·6	7·2	7·5	7·7	8·1	7·4	6·1
North-Buda	11·2	6·6	5·3	3·9	2·9	2·5	2·5	3·3	4·0	4·5	4·7	5·2
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

TABLE VI

The changing distribution of population in Budapest by major city area, suburbs and inner zones, between 1869 and 1970

Year	Buda		Pest		Budapest	
	percentage of total population					
	1	2	1	2	1	2
1869	10·6	89·4	9·9	90·1	10·1	89·9
1880	10·8	89·2	10·1	89·9	10·2	89·8
1890	10·4	89·6	12·8	87·2	12·5	87·5
1900	10·1	89·9	15·9	84·1	14·9	85·1
1910	12·5	87·5	22·2	77·8	20·7	79·3
1920	13·0	83·0	27·1	72·9	24·5	75·5
1930	17·1	82·9	33·2	66·8	30·1	69·9
1941	18·6	81·4	35·4	64·6	32·2	67·8
1949	18·8	81·2	37·5	62·5	33·5	66·5
1960	16·8	83·2	38·9	61·1	33·7	66·3
1970*	15·1	84·9	40·5	59·5	36·1	63·9

1 = suburbs, 2 = inner core

* Estimated value

the persons settling there a large number will eventually migrate to the capital, their places being reoccupied by new workers arriving from greater distances. For this reason the interchange of population among settlements within the zone of labour attraction is very strong. In the 1950s between 15 and 20,000 persons annually settled in the zone, a number which rose to more than 30,000 annually in the 1960s. At the same time only 10–12,000 left the area in each year. A small number of these out-migrants returned to their villages or moved to other industrial regions while about half migrated to the capital (Figs 5, 6, 7 and 8).

In-migrants to the zone of labour attraction come mainly from Budapest and from other parts of the country. However, while this zone has a positive migration balance with the other parts of the country, the balance with Budapest is negative. The population of the labour attraction zone grew by 102,052 persons between 1949 and 1960, mainly due to migration (Table VII).

Before the end of the century, migration to Budapest was in some places greater than natural increase. The population number of the various zones were not stable during this century either as shown in Table VIII. Considerable differences have also characterized the various settlements (Fig. 9).

Since 1869 the population of only a few settlements has decreased, while Vác and Aszód have remained relatively stable in number. On the other hand, the population of settlements along the Danube and in the neighbourhood of Budapest has multiplied enormously. Growth since 1945 has been assured by the provision of workers' residential quarters and summer resorts. Where the population decreased this was due to the disintegration of minor communities.

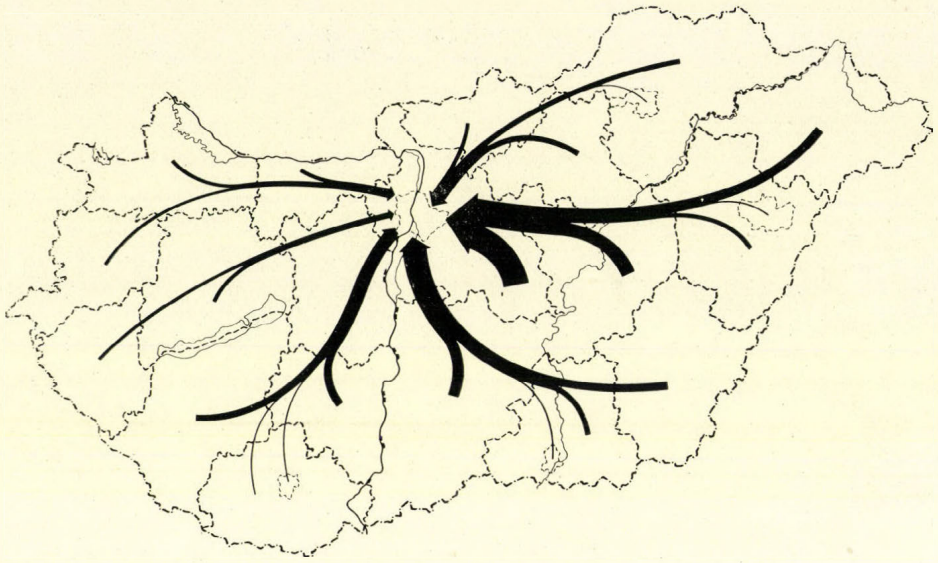


Fig. 5. Migration to Budapest in 1959 (1 mm = 800 persons)

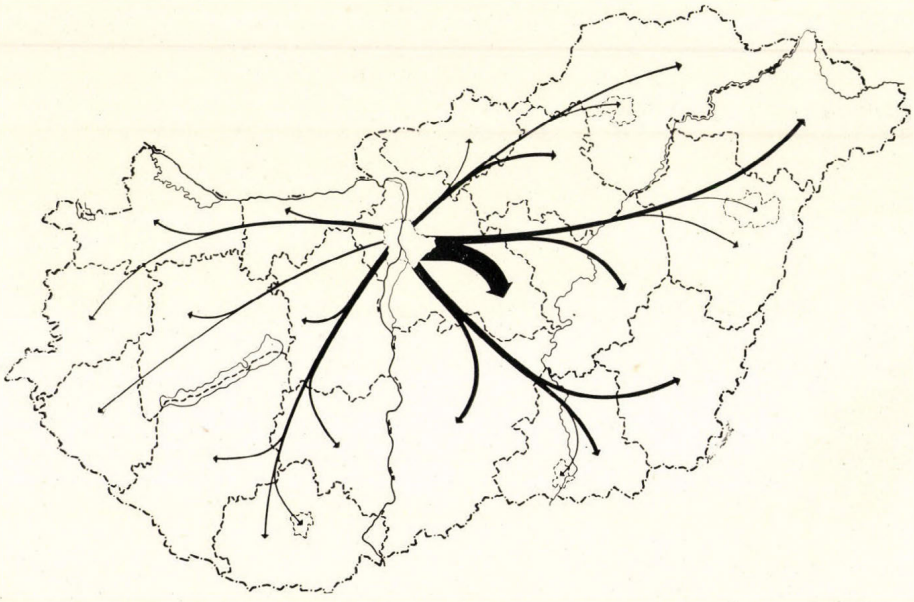


Fig. 6. Migration from Budapest in 1959 (1 mm = 800 persons)

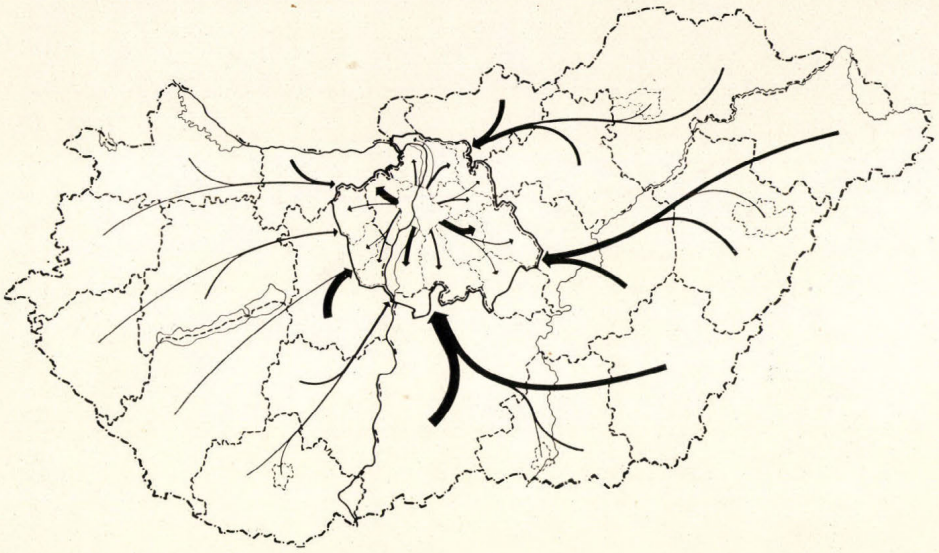


Fig. 7. Migration to the commuter zone of Budapest in 1959 (1 mm = 800 persons)

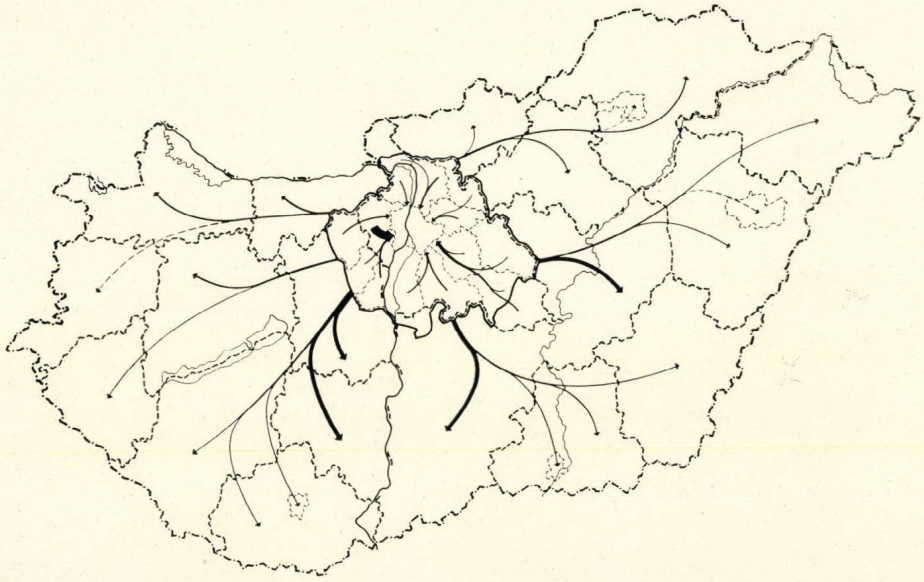


Fig. 8. Migration from the commuter zone of Budapest in 1959 (1 mm = 800 persons)

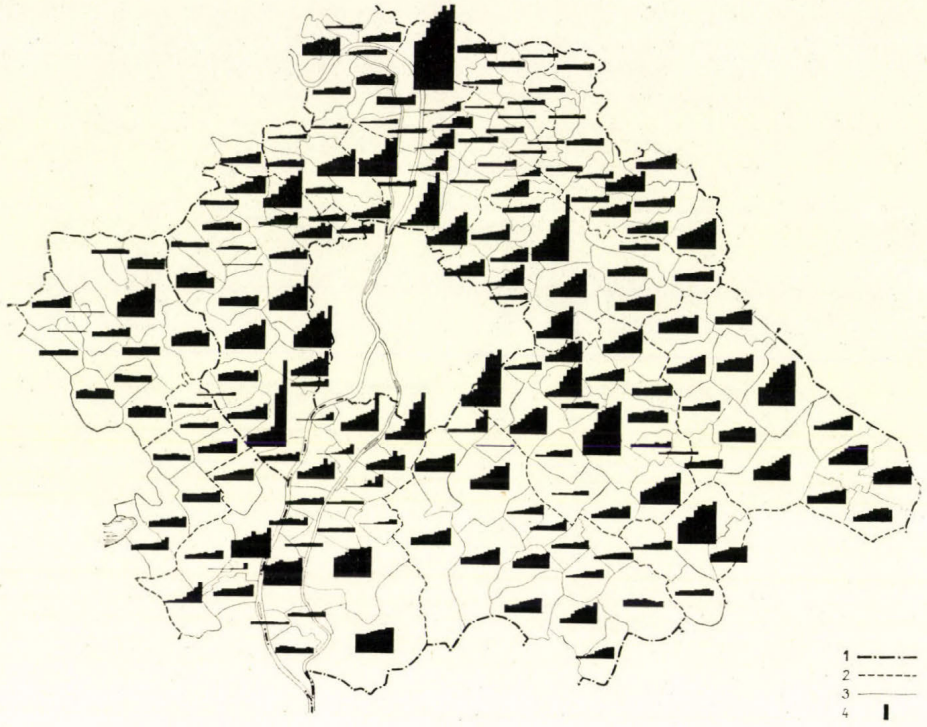


Fig. 9. The growth of population by settlements from 1869 to 1960
1 = county boundary; 2 = district boundary; 3 = community boundary; 4 = 2 mm = 1000 persons

TABLE VII

Index of intercensal population change for Budapest, 1869 to 1970 (in per cent). (Index of data from previous decennium)

Year	Inner zone of Budapest	Suburban belt	Labour attraction zone
1869–1880	133·0	134·0	104·0
1880–1890	136·4	161·7	107·2
1890–1900	149·2	187·2	120·4
1900–1910	120·0	180·0	101·0
1910–1920	105·2	133·0	141·9
1920–1930	108·5	143·0	99·0
1930–1041	115·8	126·0	109·3
1941–1949	91·8	97·2	100·1
1949–1960	113·5	113·5	116·2
1960–1970	106·6	109·2	114·5

TABLE VIII

The proportion of the population of Hungary residing in Greater Budapest and in its zone of attraction between 1869 and 1970 (in per cent)*

Area	1869	1880	1890	1900	1910	1920	1930	1941	1949	1960	1970
Greater Budapest	5·9	7·5	9·3	12·6	14·6	15·4	16·6	18·4	17·3	18·1	18·8
Labour attraction zone:											
1.	6·5	5·8	5·5	5·9	5·3	7·2	6·6	6·7	6·8	7·4	8·2
2.	6·4	6·3	6·1	6·2	6·7	8·5	8·0	8·2	8·3	9·8	10·5

1. Proportion of total population of Hungary
2. Proportion of population of Hungary excluding Budapest

* Data calculated for the territory of Hungary after 1920

The rate of population growth in the zone of labour attraction while fluctuating has tended to accelerate and has been above the rational average since 1930 (Fig. 10). Since 1869 the population in the general area of and including Budapest has almost doubled, that of the city itself has increased that of the zone of labour attraction by 250 per cent. The highest rate of growth, however, has occurred in the suburban belt where the increase has been nearly twentyfold.

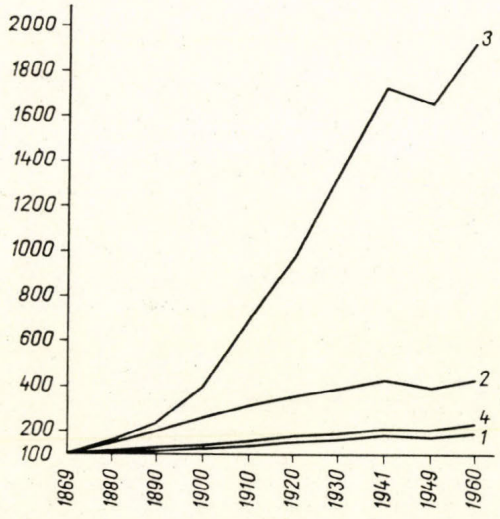


Fig. 10. The growth of population in Hungary and Budapest (1869 = 100)
1 = Hungary; 2 = Budapest; 3 = suburbs attached to Budapest; 4 = commuter zones of Greater Budapest

3. SHARE OF BUDAPEST AND ITS ATTRACTION ZONE IN THE POPULATION OF THE COUNTRY

Not only has the growth rate of the population of Budapest increased, the per cent of the total population of the country living there has risen as well. In 1869 Budapest comprised 6 per cent of the population of the country, and its zone of labour attraction a further 6·5 per cent. After that the proportion residing in Budapest rose rapidly until World War II, while that in the zone of attraction fluctuated and even decreased from time to time (Table VIII).

The numerical growth of population is associated with rising *population density*. The rapid growth of population in the former suburban belt did not cause a significant shift in the areal distribution of population. The difference in population density between the inner and outer zones of the city had been considerable and though it decreased it did not disappear. The population density of the suburban belt was 14 times smaller than that of Budapest in 1869, but by 1960 the difference had diminished by a factor of three (Table IX).

TABLE IX

The evolution of the population density of Greater Budapest and its zone of labour attraction (population per sq.km)

Year	Population density				
	Budapest	Annexed suburbs	Zone of attraction	Hungary	Hungary excluding Budapest
1869	1358·5	96	50·5	53·9	50·9
1880	1809·6	129	51·7	57·3	53·3
1890	2469·1	209	55·5	64·6	58·9
1900	3700·0	402	66·8	73·7	64·4
1910	4720·0	721	67·3	81·9	64·8
1920	4780·0	951	95·4	85·9	70·3
1930	5050·0	1336	95·3	93·5	73·1
1941	5840·0	1716	103·2	100·2	78·3
1949	5390·0	1632	104·3	99·0	82·2
1960	5563·0	1914	121·1	107·2	82·4
1970	3694·6		140·0	110·9	90·5

The population density of the zone of labour attraction is today above the national average, and high values, similar to the population density of the suburbs, are characteristic of certain settlements. Moreover, it is a feature of the population density surface that it is closely connected *with the occupational distribution of the population.*

4. SPATIAL DISPARITIES IN THE OCCUPATIONAL STRUCTURE OF THE POPULATION*

The numerical growth of the population and the increase in population-density occurred on account of the role played by Budapest in industry, trade and communications. The trends in the proportion of the population employed in manufacturing industry and transport varied through time and from place to place. On the territory of old Budapest the highest proportion (76·3 per cent) was attained in 1910, after which a declining tendency set in the present value being 10 per cent lower than in 1910 (Table X).

TABLE X

Proportion of population engaged in manufacturing industry and manufacturing and transport combined in Greater Budapest and the zone of labour attraction, 1900 to 1960

Year	Manufacturing industry		Industry and transport	
	population			
	Budapest			
	number	per cent	number	per cent
1900	308,193	41·9	472,148	64·3
1910	459,659	52·1	663,578	75·3
1920	368,504	39·7	609,945	65·8
1930	511,576	50·8	640,282	63·6
1949	440,001	41·6	648,262	61·3
1960	543,233	46·0	760,929	64·5

Year	Manufacturing industry		Industry and transport	
	population			
	Suburbs annexed to Budapest			
	number	per cent	number	per cent
1900	57,703	45·2	78,683	61·7
1910	115,286	50·2	154,422	67·4
1920	163,721	53·2	227,202	74·4
1930	245,308	56·5	325,136	74·7
1949	310,976	58·5	395,145	74·2
1960	349,352	56·0	445,464	71·4

Year	Manufacturing industry		Industry and transport	
	population			
	Zone of labour attraction of Greater Budapest			
	number	per cent	number	per cent
1900	56,485	13·9	79,669	19·7
1910	99,964	24·5	131,291	27·9
1920	103,472	17·9	148,190	25·6
1930	140,249	24·3	191,516	33·1
1949	173,484	27·4	243,298	38·5
1960	297,649	40·6	399,438	54·4

* The term occupational is used here to denote the economic character of the settlements which were examined; trade and communication taken together under the name industry.

In the annexed suburbs the ratio of workers engaged in industry and transport has been higher than in old Budapest by about 10 per cent since 1920. Almost three-quarters of the total population pursue industrial occupations. Between 1949 and 1960, however, the proportion of this class of population has decreased. In the zone of labour attraction there less than 20 per cent of the population were engaged in industry and transport in 1900. This proportion gradually increased, however, to one-third by 1930 and to more than one-half by 1960.

The change in the occupational distribution of the population is reflected in the levelling out in the proportions of the population engaged in manufacturing industry and in manufacturing and transport in the three parts

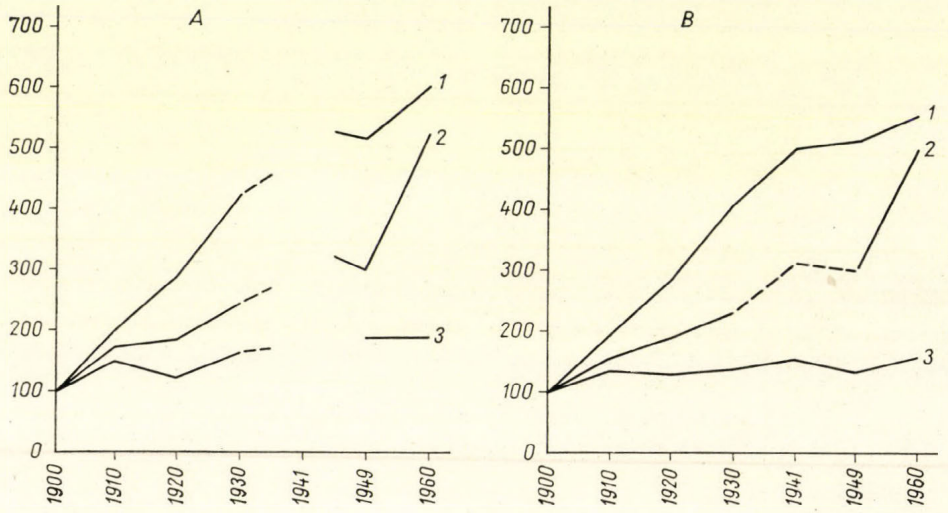


Fig. 11. The growth of the industrial population by migration (1900 = 100)
A = industrial population; B = commuters. 1 = Budapest; 2 = suburbs annexed to Budapest; 3 = sphere of attraction of Greater Budapest

of the area at around 60 to 65 per cent. This is due to the fact that the main factor in the population growth of central Budapest is no longer manufacturing but rather tertiary industry. Attraction to manufacturing industry is still the dominant force in the suburban belt and in the commuters' zone, however.

The growth of population engaged in manufacturing industry and manufacturing and transport surpasses the growth of the population at large and is more stable (Fig. 11). Further it is remarkable that the composition of the population changes in favour of the industry and transport group even when the population number is static or decreasing. After 1949 the growth of this sector has been heaviest in the zone of labour attraction. The number in manufacturing industry and in industry and transport has increased five times since 1900 in comparison with a 300 per cent rise in the population at

large. Within this the growth in the number of industrial workers was most pronounced, rising 9·9 times in the suburban belt, 6·5 times in the zone of labour attraction and 2·0 times in Budapest.

It is obvious that in Budapest and in its surroundings *labour attraction was decisive in the numerical formation of the population and in its occupational areal distribution. State administration, cultural, health and commercial function have likewise acted as forces of attraction.*

IV. THE PATTERN OF AGGLOMERATION IN BUDAPEST

The strongest influence in the areal distribution of population is the distribution or concentration of working places, because people settle where they can provide living for themselves and their families. *Population clusters formed by the attraction of labour can be divided into centres and zones of labour attraction.* The working places are concentrated in the centres of labour attraction. We may speak of a zone of labour attraction when the *concentration of working places within the area is so great that its influence extends to other settlements.* The more varied the composition of working places, the stronger is the pull of a given work centre and the larger the corresponding zone of attraction is formed of residential settlements. The evolution of the settlements with the zone of attraction depends upon the development of the centres of labour attraction.

1. BUDAPEST AND THE AREAL EXTENT OF ITS LABOUR HINTERLAND

Towns form the most important centres attracting labour. The attraction zone of a town or industrial region extends either up to the boundary of another zone or up to the limit beyond which communication conditions do not allow daily commuting to work. Therefore the *developmental stage of communications plays a decisive influence on the formation and extension of zones of labour attraction.* In feudal times the working place and place of residence of craftsmen was in one and the same building. Working places and places of residence began to separate with the spread of manufacturing establishments operating with more than one worker and with the expansion of modern capitalist manufacturing processes. Nowadays only an insignificant proportion of the population live and work at places close to each other, let alone in the same building.

Greater Budapest and its zone of labour attraction cover 7 per cent or 6,500 sq.km of the territory of Hungary. Its population which exceeds 2,500,000, comprises more than a quarter of the total population of the country. Seventy per cent of the area and population of the zone of attraction belongs to the Great Plain and 30 per cent to Transdanubia, and comprises that area from which people commute daily to work in Budapest. *The centre of this population cluster is situated within the administrative boundary of Greater Budapest.* Although other minor centres of attraction exist within the zone, they are insignificant when compared with the capital.

It was not until the end of 19th century that the development of mass communications in Budapest attained a level to ensure the smooth connection between places of work and places of residence. This period coincided with the rapid development of the suburbs, when the labour attraction zone of Budapest was furnished by the suburbs. The development of communications had a favourable influence not only on the population but also on industry. The suburbs became industrialized, thus affecting the labour attraction zone which increasingly extended beyond the suburbs. *The extension of this zone into the Great Plain is determined by travelling time, and into Transdanubia by contact with the attraction zones of other labour centres*, such as the coal region of Tatabánya and Dorog–Esztergom, and with those of Székesfehérvár and Dunaújváros and in the north the industrial zone extending along the river Zagyva.

Of the industrial regions adjacent to the capital it is characteristic that their zones of labour attraction cover smaller areas and are not as varied as that of Budapest. No sharp dividing line can be drawn, however, between the zone of labour attraction of Budapest, on the one hand, and the neighbouring zones of attraction, on the other. For example, over 100 residents of Budapest commute daily to work at Tatabánya, Dorog, Esztergom, Székesfehérvár, Hatvan and vice versa. The main form of transport within the labour hinterland of Budapest is the railway, while in the neighbouring mining region it is the motor bus. It follows that since the attractiveness of neighbouring industrial regions is relatively weak and less complex, their population clustering effect is also insignificant in comparison with that of Budapest, hardly exceeding 50,000. The neighbouring centres of attraction are either smaller towns, for instance, Tatabánya, Székesfehérvár and Dunaújváros or industrial centres comprising several small settlements such as Dorog and its surroundings and the Zagyva region.

In the area, where the population cluster of Budapest developed, the population settled in one-centre town agglomerations and zonal distribution of population corresponds with the functional agglomeration belts. The distribution of population within the centre of labour attraction is very different from that of the corresponding zone but at the same time the two are closely depending upon each other.

2. CHARACTERISTICS AND DISTRIBUTION OF POPULATION AGGLOMERATION ACCORDING TO FUNCTIONAL BELTS

Within Budapest itself the distribution of population and of job opportunities is uneven (Fig. 12). Population loss caused by the Second World War was soon made up for by in-migration and natural increase. Between 1949 and 1960, 130,000 people migrated to Budapest, the corresponding value for the period 1960–1970 increasing to 153,000. Although in-migration to the capital thus rose, the actual increase in population was 80,000 less than in the previous decade caused by a negative rate of natural increase. During the early 1950s high birth rates were prevalent which subsequently declined sharply reaching their lowest ever level in the early 1960s. This decrease in birth

TABLE XI

Population change in Budapest between 1949 and 1970 by districts

Districts	Natural increase or decrease				Migration	
	number		per cent		number	
	1949–1960	1960–1970	1949–1960	1960–1970	1949–1960	1960–1970
1	3,325	—1,282	10·2	—2·9	8,283	2,595
2	5,345	—1,658	6·7	—1·8	9.903	10,026
3	3,801	— 285	5·7	—0·4	7,400	215
4	3,125	— 627	4·4	—0·8	4,718	2,353
5	3,372	—2,265	6·4	—3·4	9.713	—1,808
6	3,160	—3,605	3·8	—4·0	4,929	— 27
7	2,551	—5,517	2·2	—4·6	2,006	1,322
8	2,320	—5,099	1·6	—3·6	790	—4,096
9	4,071	—1,453	4·3	—1·5	—2,929	14,302
10	4,158	648	6·6	0·9	1,232	3,077
11	5,912	— 298	6·8	—0·3	16,408	42,379
12	4,080	— 877	7·3	—1·3	8,349	9,972
13	6,003	—2,502	4·6	—1·8	5,583	7,307
14	4,466	—2,074	4·8	—1·8	18,975	20,657
15	2,917	— 149	5·2	—0·2	2,145	— 241
16	2,579	359	5·6	0·7	5,051	7,389
17	2,233	1,549	6·2	3·7	4,138	6,240
18	3,542	1 766	6·0	2·5	7,202	18,698
19	2,292	—1,341	3·6	—2·1	— 253	1,518
20	7,090	2,314	7·9	2·3	5,351	3,126
21	5,567	3,711	11·9	6·2	7,775	7,455
22	2,931	1,020	8·9	2·6	2,681	812
Budapest, total	84,840	—17,655	5·3	—1·0	129,450	153,271

rates was not matched by increased longevity and the population of Budapest declined by 18,000 during the last 10 years through reproductive change (Table XI).

Large differences in growth rate exist among the various administrative districts of Budapest. The 5th, 6th, 7th and 8th Districts are still the most densely populated and although their populations show a tendency to decline, density per sq.km still exceeds 1000 persons.

Urban population decrease is connected with the growth of business and office functions in the central area and indeed data for 1960 show that twice as many people work as reside in the 5th District. Bad living conditions and high levels of in-migration created overcrowding and retail premises were transformed into flats. Large scale housing programmes were only started in Budapest in the 1950s in the 13th District and since then dwellings unsuitable for habitation have slowly been cleared. In the very centre of the city new apartment blocks were the exception rather than the rule and although dwellings destroyed during the war were rebuilt only office and commercial blocks are now constructed in the 5th District. Slum clearance was started

difference		Actual change			
per cent		number		per cent	
1949–1960	1960–1970	1949–1960	1960–1970	1949–1960	1960–1970
25·5	5·9	11,608	1,313	35·7	3·0
12·5	10·6	15,248	8,368	19·2	8·8
11·2	0·3	11,201	— 70	16·9	—0·1
6·7	3·0	7,843	1,726	11·1	2·2
18·4	—2·8	13,085	—4,073	24·8	—6·2
6·0	—0·0	8,089	—3,632	9·8	—4·0
1·7	1·1	4,557	—4,195	3·9	—3·5
0·6	—2·8	3,110	—9,195	2·2	—6·4
—3·1	15·1	1,142	12,849	1·2	13·6
1·9	4·5	5,390	3,725	8·5	5·4
18·9	38·9	22,320	42,081	25·7	38·6
14·9	14·6	12,429	9,095	22·2	13·3
4·3	5·2	11,586	4,805	8·9	3·4
20·6	17·9	23,441	18,583	25·4	16·1
3·8	—0·4	5,062	— 390	9·0	—0·6
11·1	13·8	7,630	7,748	16·7	14·5
11·6	14·9	6,371	7,789	17·8	18·6
12·3	26·9	10,744	20,464	18·3	29·4
—0·4	2·4	2,039	177	3·2	0·3
6·0	3·0	12,441	5,440	13·9	5·3
16·7	12·4	13,342	11,166	28·6	18·6
8·1	2·1	5,612	1,832	17·0	4·7
8·2	8·5	214,290	135,606	13·5	7·5

a few years ago in the 8th District, the bad housing being replaced by tall apartment buildings. These, however, do not create such a high density of population as the old housing blocks. Recent housing programmes are closely connected with city reorganization and have produced a decrease in population in the 3rd and in the 15th Districts. In a few years, however, the number of new flat owners will sharply increase.

Population increase in the industrial districts of the capital is only moderate unless new residential blocks were also built there. In the industrialized 4th, 10th and 13th Districts, housing development is carried out in conjunction with city reorganization. Factories which cause air pollution have been relocated outside the city limits and their places taken by modern apartment blocks. As large investments are required for this programme, progress has been rather slow. Those Districts, namely the 2nd and 16th, where family houses and small apartment houses are most prevalent, show average density.

In the outlying settlements surrounding the capital but which are now incorporated in it, namely the 4th, 20th, 21st and 22nd Districts, population distribution is being shaped even more by present housing programmes.

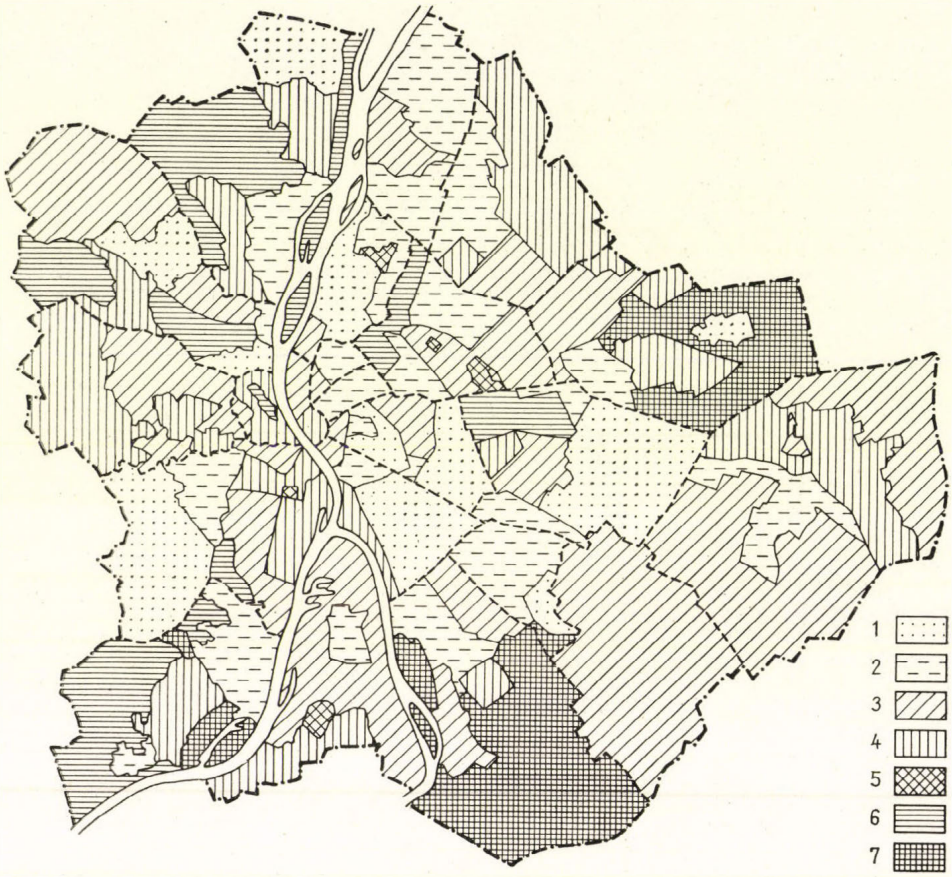


Fig. 12. Growth of population from 1949 to 1960 by census districts (after Szabady, 1962). 1 = population decrease; 2 = population increase less than 10 per cent; 3 = from 10 to 25 per cent; 4 = from 25 to 50 per cent; 5 = from 50 to 400 per cent; 6 = population increase greater than 400 per cent; 7 = unpopulated in 1949

The density of population is only increasing in the 21st District where a whole new residential neighbourhood has been built (Table XII). Dormitory regions attached to these outlying settlements show a similar pattern of population evolution. The high population density of Csepel has spread to the communes along the Danube south of Budapest, as industry is relocated there from other parts of the capital.

Areas with high population density form a semi-circle around the comparatively low density urban core comprising the northern part of the 5th District (Fig. 13). In Buda this high density belt only appears in the Castle district and in immediately adjoining areas. The high density zone is followed on its outer edge by another region of relatively low density which is more

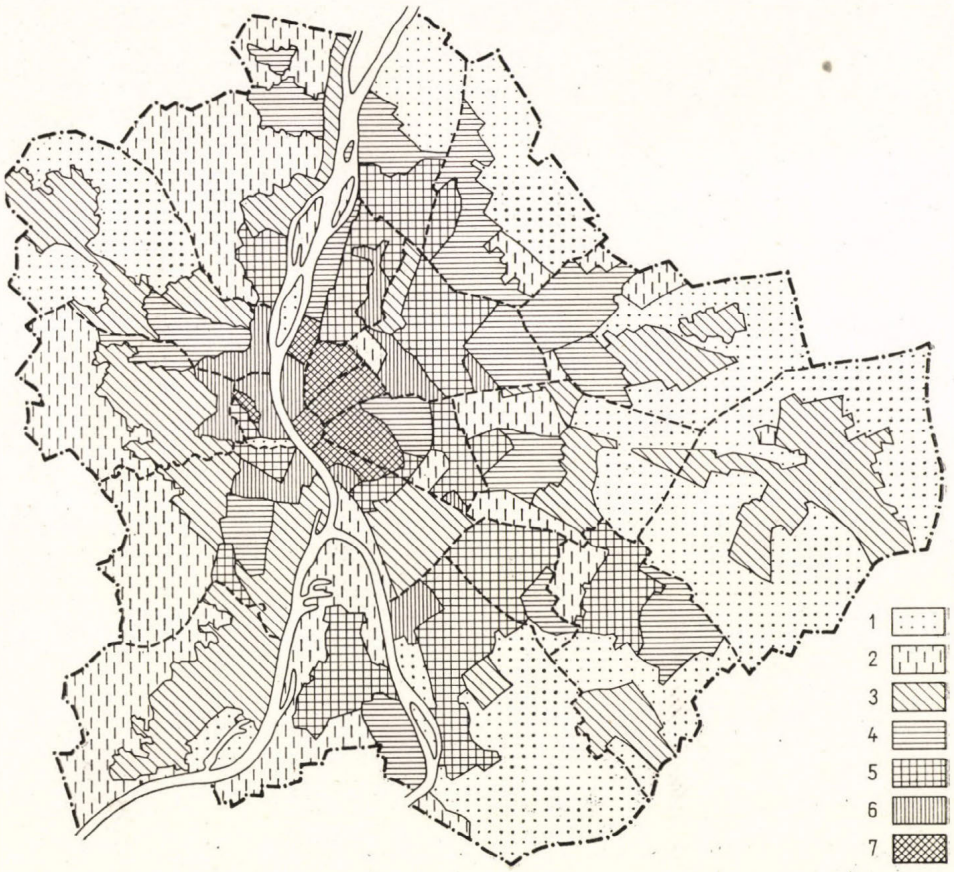


Fig. 13/a Population density of Budapest in 1960 by census districts (after Szabady, 1962). 1 = below 100; 2 = from 100 to 1000; 3 = from 1000 to 3000; 4 = from 3000 to 5000; 5 = from 5000 to 10,000; 6 = from 10,000 to 25,000; 7 = above 25,000 persons/sq.km

extensive in Pest than in Buda. The area of the highest population density developed in the historical centre of the city on Castle-hill. The adjoining parts of the neighbouring 2nd, 12th and 11th Districts are connected with it. This densely populated zone is encircled by an area of lower population density which is characteristic of most cities. This belt is more extensive in Pest and in Buda occurs only in patches. In Buda the extent of the sparsely populated areas, i.e. population density less than 100 persons per sq. km, is insignificant, but in Pest by contrast is highly characteristic of the districts of the urban fringe.

In 1960 in Budapest 65 per cent of the population was gainfully employed, 48·1 per cent of them in industry. The proportion of those in industry and

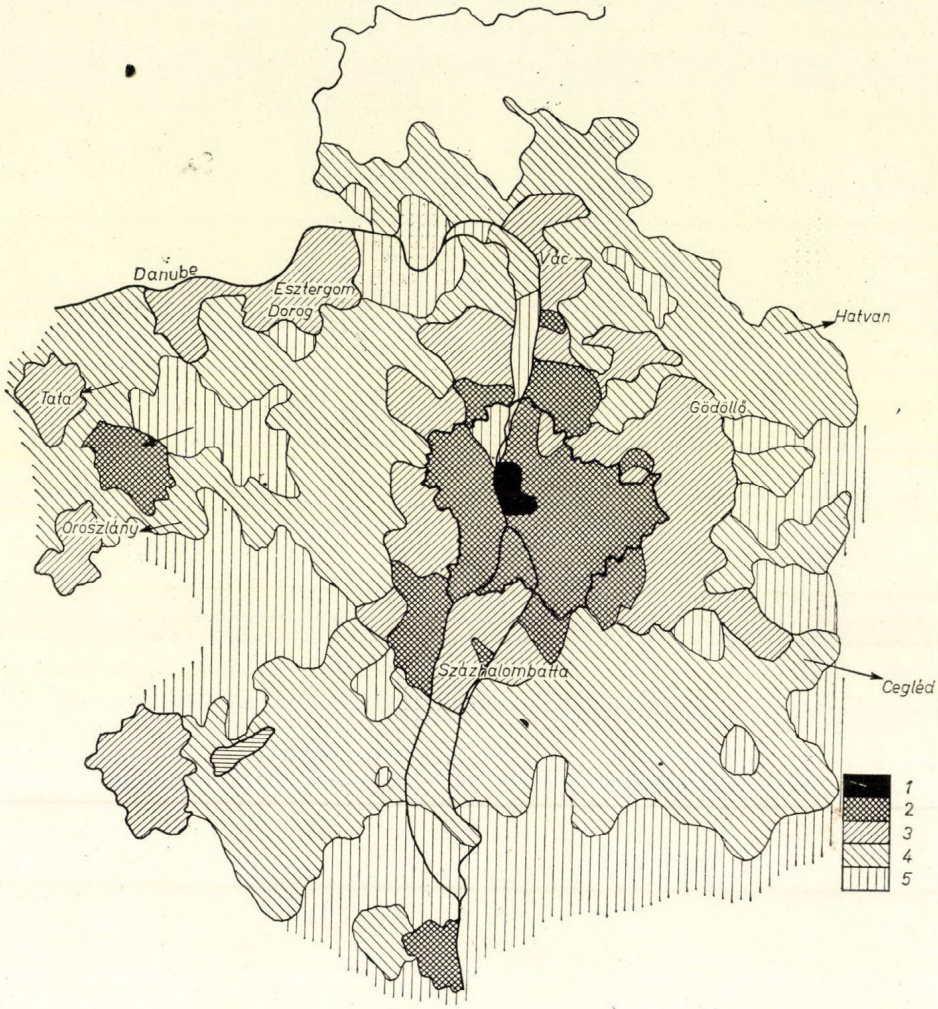


Fig. 13/b. Population change in Budapest and the commuter zone between 1960 and 1970. *Decrease* (1,5): 1 = by more than 1000 per sq. km; 5 = by less than 20. *Increase* (2, 3, 4): 2 = by more than 100 per sq.km; 3 = 20—30 per sq.km; 4 = 0—20 persons

transport amounted to 64·8 per cent (Table XIII). In Csepel and Újpest 65·6 per cent and 59·5 per cent respectively of all earners had industrial occupations. The proportion of industrial wage earners was more than 50 per cent in Districts 22, 11, 15 and 10, being highest in North- and South-Pest. In some belts there is a close correlation between population density and occupational structure, the parts inhabited mainly by workers in the industry comprising an area of "moderate density" surrounding the belt of high-density-population. The proportion of the population with industrial occupa-

TABLE XII

Population density in Budapest in 1960 and 1970 by districts

District	Density		Change 1960/1970
	1960	1970	
	person/sq.km		person/sq.km
1	12,928·0	13,313·5	385·5
2	2,606·0	2,836·8	230·8
3	1,954·0	1,952·4	—1·6
4	4,157·0	4,249·4	92·5
5	25,431·0	23,858·7	—1,572·3
6	38,003·0	36,477·3	—1,525·7
7	57,168·0	55,170·0	—1,998·0
8	20,936·0	19,587·7	—1,349·0
9	7,559·0	8,584·7	1,075·7
10	2,117·0	2,231·4	114·4
11	3,260·2	4,517·6	1,257·4
12	2,564·0	2,905·7	341·7
13	10,576·0	10,933·2	357·2
14	6,364·0	7,387·1	1,023·1
15	2,284·0	2,269·7	—14·3
16	1,591·0	1,822·7	231·7
17	772·0	915·3	143·3
18	1,780·0	2,304·0	524·0
19	6,946·0	6,965·2	19·2
20	1,921·0	2,023·7	102·7
21	2,337·0	2,772·0	435·0
22	1,129·0	1,182·3	53·3
Budapest, total	3,437·3	3,694·6	257·3

tions is less than 33 per cent in Districts 17, 16 and 15, where the percentage of agricultural workers is above average, and also in some parts of the inner city, which is inhabited mainly by workers in the commercial and public services sectors.

The proportion of workers in the transport industry is high near the railways, reaching 15 to 25 per cent in the vicinity of railway stations and freight-yards.

The proportion of those employed in the retail and wholesale trade comprises 10 per cent of all wage-earners but is higher in the inner districts where the population density is high, and lowest in districts of the urban fringe such as Csepel and Újpest.

Workers in administration are concentrated in the inner core and in Buda.

Pensioners average 14 per cent but this value is higher in certain parts of Budapest, especially in the suburban areas with gardens where they comprise 20 to 25 per cent of all earners.

The distribution of population conforms with the arrangement of working places and places of residence. The population density of those parts of the city where working places are concentrated is smaller and in number either

TABLE XIII

The occupational structure of wage-earners in Budapest according to districts in 1960 (in per cent)

District	Agriculture	Industry and building industry	Communications	Trade	Services	Administration	Other and pensioners
1	1·1	37·7	6·3	10·6	9·6	17·5	17·2
2	1·6	37·4	6·4	9·8	9·4	17·7	17·7
3	1·3	54·1	6·0	7·5	5·5	9·0	16·6
4	0·6	62·3	5·2	6·0	4·0	6·1	15·8
5	0·8	38·4	5·1	13·5	10·5	16·6	15·1
6	0·7	40·1	7·0	14·2	9·3	12·4	16·3
7	0·6	42·1	6·8	14·7	8·8	10·6	16·4
8	0·7	43·1	7·0	12·6	7·9	11·7	17·0
9	0·7	44·0	7·9	11·6	7·3	10·7	17·8
10	0·9	56·4	7·1	7·1	4·3	7·9	16·3
11	1·4	45·2	6·2	8·4	7·0	14·0	17·8
12	1·5	37·2	6·4	9·3	8·8	18·9	17·9
13	0·5	48·4	6·7	10·2	7·2	9·9	17·1
14	1·0	46·5	9·5	9·6	7·1	11·5	14·8
15	2·3	54·7	7·3	7·6	3·6	7·1	17·4
16	2·4	51·1	9·2	8·7	4·1	7·3	17·2
17	3·9	51·3	9·2	7·6	3·7	6·9	17·4
18	1·3	51·4	8·2	7·4	3·9	6·8	21·0
19	0·6	52·2	8·4	8·2	4·3	7·7	18·6
20	1·5	56·0	6·4	8·2	4·0	5·9	18·0
21	1·5	70·7	4·6	4·9	2·1	4·8	11·4
22	5·5	57·0	5·4	8·2	2·6	6·3	15·0
Budapest, total	1·2	48·1	6·9	9·8	6·6	10·6	16·8

decreasing or stationary. At the same time the population continues to grow in neighbouring parts and a correspondence even appears between the character of working places and the occupational structure of the population.

The city centre. One of the most developed districts from the point of view of place of work is District 5, the centre of the agglomeration developing in its larger northern half. The state administration, political, ecnomic, cultural and scientific institutions, wholesale trading companies, as well as the specialized retail trade are concentrated here.

In this district there had been no sign of depopulation before 1960 as is often the case with the city cores of giant agglomerations such as London, Paris or New York; on the contrary, since 1949 it has shown the greatest rate of population growth. Still the number of persons working in this district, namely 105,000,* is almost double the residential population. The daily

* Commuters from the zone of labour attraction are not included in this number. only residents. According to the author's estimate, the number of commuters to District 5 may be between 10,000 and 15,000, i.e. about 7 to 10 per cent of all commuters.

TABLE XIV

The distribution of wage-earners employed in District 5 according to their places of residence in 1960

Place of residence, district	Office		Manual		Total	
	workers					
	number	per cent	number	per cent	number	per cent
1	2,920	5·0	1,013	2·1	3,933	3·7
2	5,356	9·0	2,268	5·0	7,624	7·3
3	1,788	3·0	1,514	3·1	3,302	3·1
4	964	1·6	871	3·0	1,835	1·7
5	6,076	10·2	6,471	14·4	12,547	12·0
6	4,228	7·1	3,189	7·0	7,417	7·0
7	4,340	7·3	4,339	9·4	8,679	8·2
8	4,513	7·5	4,212	9·1	8,725	8·3
9	2,857	4·7	2,771	6·1	5,628	5·3
10	1,046	1·7	1,274	2·6	2,320	2·2
11	5,124	8·5	2,026	4·6	7,150	6·8
12	3,931	6·5	1,375	3·0	5,306	5·1
13	5,431	9·1	3,959	8·2	9,390	8·9
14	4,107	7·0	2,756	6·0	6,863	6·5
15	996	1·6	958	2·1	1,954	1·9
16	874	1·4	1,067	2·3	1,941	1·8
17	585	1·0	727	1·5	1,312	1·2
18	946	1·5	1,234	2·6	2,180	2·1
19	1,302	2·2	1,236	2·6	2,538	2·4
20	1,223	3·0	1,678	3·4	2,901	2·8
21	393	0·5	503	1·1	896	0·9
22	431	0·6	419	0·8	850	0·8
Budapest, total	59,431	100·0	45,860	100·0	105,291	100·0

movement of workers to District 5 extends to all districts of Budapest, and even to the outer commuter belt (Table XIV).

The ties of District 5 are strongest with the adjacent area of high population density* and with Buda. They are weakest with the industrial areas of Újpest and Csepel, and with Districts 17 and 22 on the urban periphery.

That the attraction of office employees is stronger than of manual workers follows from the character of District 5. The proportion of wage earners resident in the individual districts who work in District 5 also varies considerably as detailed in Table XV.

The inner residential belt comprises an area of high population density area surrounding the city centre. It is characteristic that this zone cannot be accurately delimited from adjacent areas. In the parts bordering on District 5—especially off the Great Boulevard—many offices, warehouses and other working places fitting into a city can be found, while on the fringe

* The population of District 5 decreased by 4000 between 1960 and 1970.

TABLE XV

The proportion of wage-earners in the various districts of Budapest in 1960 (in per cent)

Place of residence, district	Office	Manual	Total
	workers		
1	24·2	9·0	13·8
2	23·0	9·0	13·0
3	17·7	5·0	6·6
4	9·5	2·6	3·5
5	34·0	33·7	29·9
6	21·6	10·4	12·5
7	19·4	9·7	10·6
8	13·8	8·2	9·2
9	17·1	7·7	8·8
10	11·4	4·3	5·1
11	20·0	6·3	10·3
12	22·8	7·4	12·3
13	20·7	7·2	9·8
14	19·0	5·4	9·0
15	12·5	4·1	4·9
16	13·0	5·5	6·0
17	12·7	4·7	5·3
18	11·6	4·4	5·0
19	12·8	5·2	6·0
20	10·7	4·8	4·5
21	6·0	1·8	2·3
22	9·5	2·7	3·6
Budapest, total	18·6	7·0	9·0

of the industrial belt are located some important factories, a railway station and business premises. In Buda the situation is different, this area being made up almost entirely of residential quarters and regions largely of working place character can be found only in Districts 3, 11 and 22. The inner residential belt is bounded on its outer limits by a zone of working place largely of industrial character. This latter area is composed of two parts, namely, *the inner and outer industrial zone. The inner industrial zone* developed in the last century most vigorously on the northern (District 13), eastern (District 10) and southern (District 21) fringes of the historical core of the city. Among the districts comprising the outer belt the working place character relatively speaking is strongest in District 10 which in this respect is second only to District 5 and in terms of number employed in District 13. The situation is different in the other districts of this outer industrial belt where the proportion of resident population is higher.

The industrial establishments of this outer area tend to be old. Thus, while the industry of District 13 is still considerable, its residential character is becoming more prominent with the removal from the southern part of the district of unimportant factories and the erection in their place of apartment

blocks. The same process of industrial clearance is also occurring along the lower part of Váci Street.

The industry of District 14 which belongs to the inner industrial belt and of District 11 in Buda is newer and on a smaller scale than that mentioned above. The locations selected for industry were more systematic and up-to-date.

The industrial parts of District 3 in North-Buda also belong to the outer working place belt, but are separated from the neighbouring industrial quarter in District 13 by the Danube. They are also separated from the South-Buda industrial quarter in District 11 by a residential area.

It is characteristic of the outer working place belt that most of its employees are attracted from the neighbouring residential districts. At the same time, workers also commute to it from the outer fringes of the agglomeration. The majority of white collar workers employed in the outer working place belt live in the inner residential belt, while most of the manual workers reside in the former suburbs. More than three-quarters of the workers in District 10 are employed in manual work.

Number of wage-earners living in District 10	68,797
Number of wage-earners employed in District 10	86,253

The proportion of residents of 4 districts employed in District 10, in per cent:

District 17	22·1
District 18	11·5
District 19	10·6
District 14	5·5

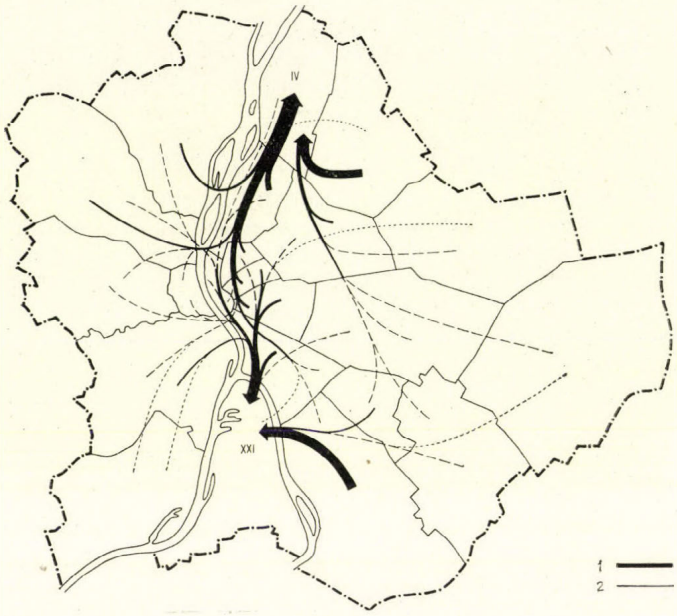
Number of wage-earners living in District 13	142,137
Number of wage-earners employed in District 13	94,714

The proportion of residents of 2 districts employed in District 13, in per cent:

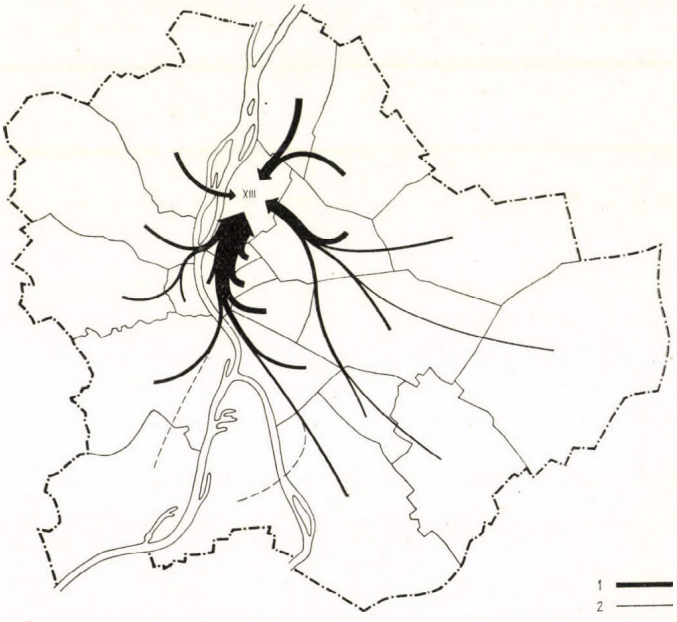
District 4	11·5
District 15	10·0

The labour attraction of the outer working place belt is not just restricted to Budapest but extends to the commuter zone as well. Many employed in District 13 reside in settlements situated to the north of Budapest; while to District 10 workers are drawn from the settlements situated along the Budapest–Hatvan, Budapest–Nagykáta and Budapest–Cegléd railway lines, District 9 attracts workers from the south of Budapest (Figs 14a, b, c, d, e, f).

The outer industrial zone is territorially the organic continuation of the *inner industrial zone*, the two together forming the outer belt of working places in Budapest. The difference between the two parts is only that the latter came later to the suburbs while its industrial and residential components are more sharply distinguished. Regrettably this is not apparent



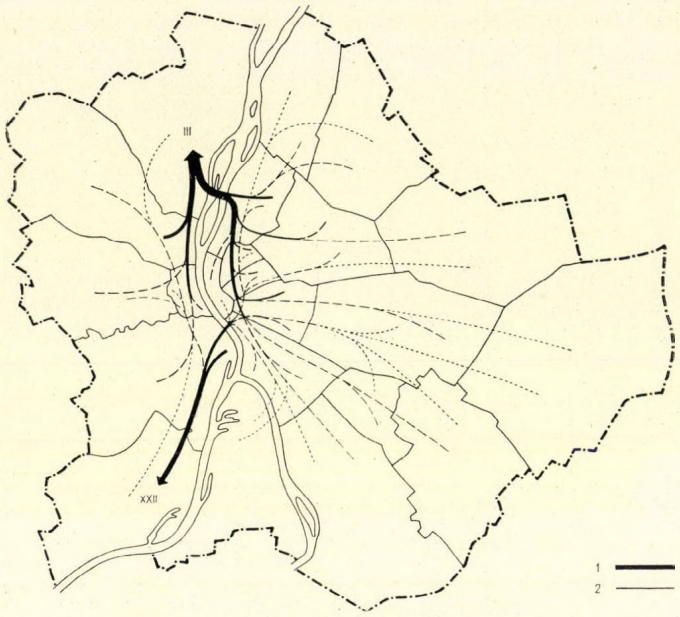
a



b

c

d



e

f

Fig. 14/a–f. The attraction of labour to the administrative districts of Budapest 1 = 1 mm = 4000 persons; 2 = boundaries of districts

from the district records, which only reveal that the *districts belonging to this zone are of dual character.*

The residential character of even the most industrialized part, namely *Újpest* and *Csepel*, is remarkably high. Former residential areas were retained intact adjacent to the industrial parts, and new ones have even been developed, for instance, the Király-erdő neighbourhood established during the Second World War, and the "Csillag" neighbourhood during the 1950s. More than three-quarters of the workers in both districts are engaged in industry.

Number of wage-earners living in District 4	52,270
Number of wage-earners employed in District 4	53,899

The proportion of residents of 2 districts employed in District 4, in per cent:

District 4	70·0
District 15	30·0

Number of wage-earners living in District 21	38,476
Number of wage-earners employed in District 21	45,491

The proportion of residents of District 20 employed in District 21, in per cent

District 20	20·0

Although in both districts the number of wage-earners was smaller than the number of residents, a large number of the latter were still employed in other districts, especially in Újpest. The majority of industrial workers naturally work in their district of residence. Thus, 81 per cent of industrial workers living at Csepel and 67 per cent of those living in Újpest are employed locally. Those working in other districts are generally white collar workers.

Only *a small portion* of the remaining districts belonging to the outer industrial zone is of *working place character.* Their residential character is therefore more obvious from the district records. For instance, the number of wage-earners in District 17 is 16,267, in District 21 18,725 and in District 20 20,250 while the number of residents is 43,444, 42,077 and 64,079, respectively. This situation would be modified by taking into account the number of commuters, who comprise an important sector of the labour force in the outer industrial belt.

The pull of this outer belt is also strong, however, in the other residential and working place districts. Thus, Újpest has its strongest labour links with Districts 15 and 13 and also with the settlements situated along the northern railway lines. Many living in the neighbouring District 20 and in settlements situated along the railway of the southern half of the city work in Csepel. Similar features are displayed by the other districts in the belt (Table XVI).

The outer residential belt: between the various sectors of the outer working place belt extensive residential areas are situated mainly in Districts 15, 16, 17.

Few working places exist in these districts, especially in District 17 where no large factories are located. The number of workers in this district is thus small in comparison with those commuting from it. The character of these residential districts is similar to the settlements in the commuter belt proper.

TABLE XVI

Distribution of all wage-earners* in Budapest according to working places in 1960 (in per cent)

District	Office	Manual	Industrial	Total
	workers			
1	2·2	1·2	1·2	1·2
2	3·8	2·7	2·0	2·5
3	2·5	3·6	4·0	2·7
4	3·9	6·5	7·5	4·6
5	18·7	7·0	6·1	9·0
6	7·1	4·2	2·9	4·2
7	5·9	5·8	4·2	5·0
8	9·2	7·9	6·8	6·9
9	6·3	7·5	6·5	5·9
10	5·3	7·8	9·6	5·8
11	5·5	6·2	6·7	4·8
12	2·8	1·9	1·3	1·8
13	7·5	10·7	11·1	7·9
14	4·1	5·5	4·9	4·0
15	0·8	1·2	1·1	1·8
16	1·0	1·3	1·3	0·9
17	0·4	0·6	0·3	0·4
18	1·2	1·2	1·8	1·4
19	1·5	2·3	2·2	1·5
20	1·7	2·4	2·1	1·7
21	3·2	5·4	6·8	3·9
22	1·0	1·4	1·3	1·1
Outside Budapest	3·1	1·3	1·6	1·5
Undetected districts**	1·3	4·4	6·2	19·5
	100·0	100·0	100·0	100·0

* Industry and building industry combined
** For lack of data the Central Statistical Office published no grouping by place of work

The difference is that the settlements annexed to Budapest are nearer to the places of work, while their transport links are also better developed than in the majority of settlements in the commuter belt.

The labour attraction zone of Budapest grew jointly with the localization of working places in the capital. The population clustering effect of the attraction of labour to Budapest became perceptible only after the end of the century. Before that population growth was very slow. Until the second half of the last century only a few of the large estate centres, such as Vác, Gödöllő,

Aszód, Monor, Alsóalmádi, Ráckeve, Ercsi, Érd, Bicske, Zsámbék, Szentendre and Visegrád—contained significant populations, in which the landlord possessed market privileges. As such they became the centres of small zones of attraction. The industrialization of Budapest had, however, a strong influence on its surrounding also. While industry was only established in the inner part of Budapest, the population absorbing effect of labour attraction was strong, yet as the outer industrial belt developed commuting became more and more important. The areal extent of the attraction of Budapest to labour grew and the settlements in the zone were gradually transformed. The formerly more populated centres, Vác, Szentendre and Gödöllő excepted, are today only small administrative and cultural centres. *The growth of population in settlements situated within the zone of labour attraction depends entirely on their relation with Budapest.*

Population growth is not everywhere the same within this commuter zone. The strongest influence on the number of population is the transport links of the settlements with Budapest. Population increase is far greater in settlements situated near railway lines, with one or more railway stations, than in settlements not directly linked with the capital by railway. Moreover the population frequently decreased between 1930 and 1949 in settlements distant from railway lines. The population growth rate only rose with the improvement of transport, and the introduction of regular services, running several times daily.

Although the population of the whole commuter belt is growing, considerable variations in degree exist. Thus, the population in the Lowland parts of the zone is higher than in the Transdanubian sector and the difference is still widening. Variations still exist *according to transport situation.* The number and proportion of the population in the commuter zone along railway lines has grown while in settlements more distant from railway lines, has been slower, and their share of the total population of the zone is constantly decreasing (Fig. 15).

The transport links of settlements have an influence *on the areal distribution of population.* In settlements with good transport connections not only are the population number and the growth rate high but also the density. This

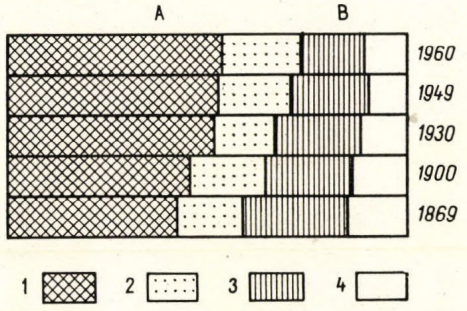


Fig. 15. The distribution of settlements in the commuter zone of Greater Budapest (column = 100 per cent)
A = settlements by railway lines; 1 = on the Great Plain; 2 = in Transdanubia
B = settlements without railway lines; 3 = on the Great Plain; 4 = in Transdanubia

means that the attraction of labour to Budapest raises the number of settlements of high population density. This is natural, since commuters can easily reach their working places from settlements with good transport facilities. The number of settlements in the commuter zone is constantly growing, increasing from 164 in 1900 to 185 in 1960. Most of the new settlements rose out of the residential quarters of commuting workers, and have developed into points of high density, i.e. 100 to 1000 persons per sq.km on the population-density surface. A few of the new communities are of agricultural character, and have lower population densities. It is characteristic of the distribution of population that in 1900 population density was higher than 100 persons per sq.km (Table XVII).

TABLE XVII

The distribution of settlements in the years 1900 to 1960

Year	Density distribution in per cent					
	< 40	40–75	75–100	100–150	150–200	> 200
1900	7·7	44·9	24·8	15·0	0·7	6·9
1930	1·4	22·9	20·5	24·9	10·8	19·5
1949	1·7	19·3	15·9	23·4	13·5	25·2
1960	0·6	15·8	13·1	21·7	11·6	37·2

The settlements of high population density follow the railway lines (Figs 16, 17, 18, 19). This characteristic is particularly striking in the Great Plain.

Since the development of bus services, since 1949, population density had grown in the Transdanubian sectors of the zone and has decreased in the Great Plain. There are several settlements in Transdanubia which are not far from Budapest, and from which commuting by bus is considerable (Table XVIII).

In 1900 settlements of a low population density had been more numerous owing to the economic character of the area (Fig. 20). Where *more than 50 per cent of the population* live from industry and transport occupations *popula-*

TABLE XVIII

Population density in the commuter zone of Greater Budapest, 1869—1960
Settlement population density per sq.km

Year	Near railway lines			Distant from railway lines			In all settlements		
	Great Plain	Trans-danubia	Total area	Great Plain	Trans-danubia	Total area	Great Plain	Trans-danubia	Total area
1869	61·5	57·5	55·0	40·0	51·9	44·0	48·0	54·6	50·0
1900	76·9	74·9	76·4	51·7	62·5	55·4	66·0	68·6	66·8
1930	121·2	105·9	117·1	68·0	73·1	69·4	98·3	88·6	95·3
1949	138·5	128·4	135·8	66·7	66·3	66·5	107·5	96·7	104·3
1960	168·1	159·8	165·3	58·9	80·2	66·1	124·4	119·1	121·1

tion density is above 100 persons per sq.km. In the labour attraction, i.e. commuter zone of Budapest 79 per cent of the population engaged in industry and transport in the area is clustered in these settlements. In settlements were the proportion is below 15 per cent, population density does not exceed 75 persons per sq.km.

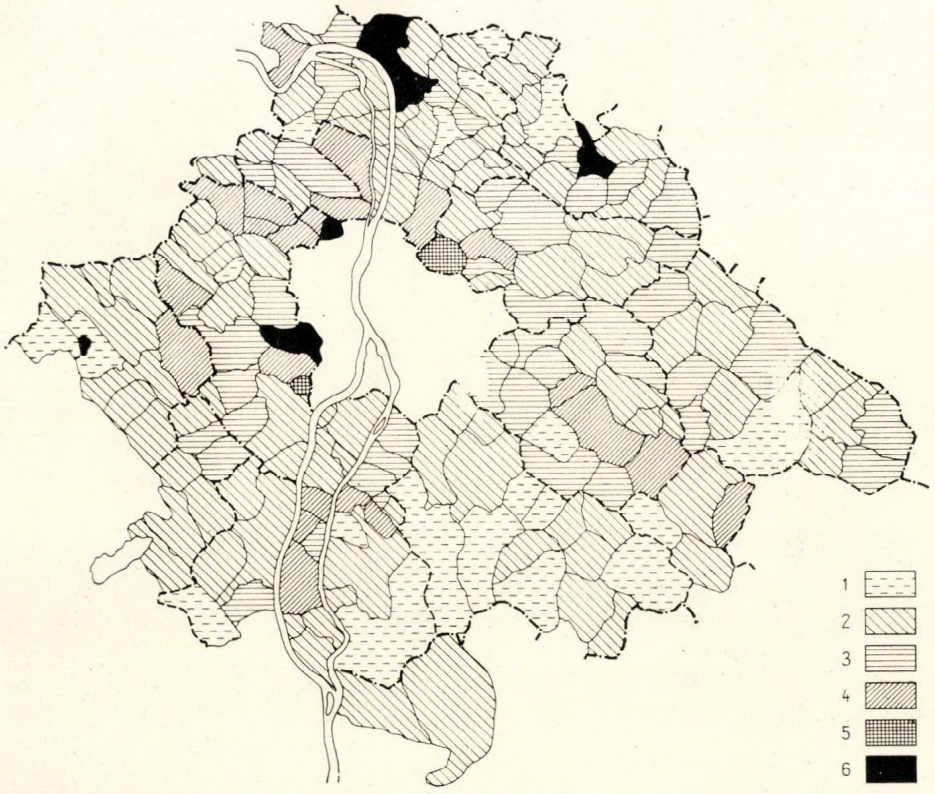


Fig. 16. Population density in the commuter zone of Budapest in 1900
1 = below 40; 2 = from 40 to 75; 3 = from 75 to 100; 4 = from 100 to 150; 5 = from 150 to 200; 6 = above 200 persons per sq.km

In 1900 settlements of low population density and of agricultural character were more numerous in the commuter zone of Budapest. There was no settlement in which the proportion of the population in industry and transport was greater than 50 per cent; 40 per cent was exceeded in six settlements, however. In 1960 the proportion of population in industry and transport in 14 settlements exceeded 70 per cent and was above 40 per cent in 122 settlements. In 1900 this same proportion was under 5 per cent in 10 settlements, while in 1960 no such settlements existed.

The great change in the occupational structure of the settlements has also derived from their transport situation. The migration of population into

settlements situated near Budapest or along railway lines was extensive and population density and proportion of workers with industrial occupations consequently rose. The percentage of industrial population grew at the expense of agricultural employment, workers in the younger age groups in particular changing to industrial occupations.

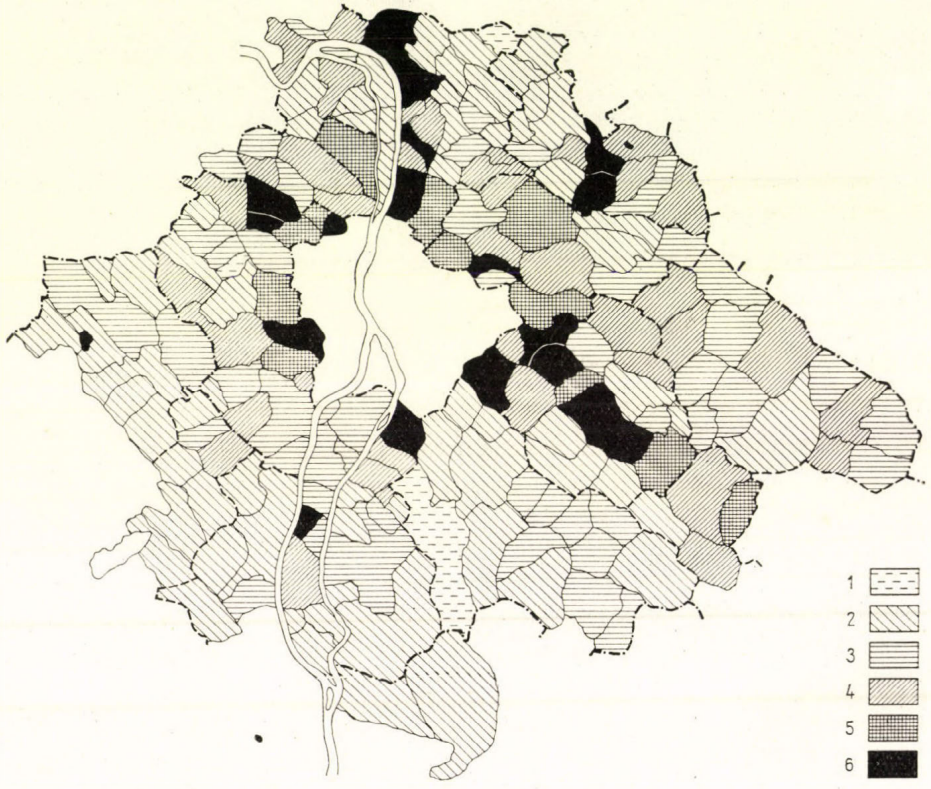


Fig. 17. Population density of the commuter zone of Budapest in 1930 (legend in Fig. 16)

The attraction of labour to Budapest influenced the population in the settlements along the railway lines. The transformation first started along the Budapest–Vác and Budapest–Cegléd lines and along the tracks of the local suburban railway around Budapest, the HÉV. The attraction of labour to Budapest played an insignificant role in the evolution of the settlements in the commuter zone in 1900, although the transformation had begun along the above-mentioned railway lines and HÉV. According to the census of 1930 the zone of labour attraction was already outlined, although its agricultural character was still strong, especially south of Budapest. In 1949 the situation was similar to that at present in that the commuter zone had grown to encircle Budapest. After 1949 a great transformation took place

particularly in the area of the Great Plain, south of Budapest (Figs 21, 22, 23, 24).

In the commuter zone 52·6 per cent of the wage-earners and 50 per cent of all earners are industrial workers. The proportion of industrial wage-earners conforms with the transport situation of the settlements and is highest in those situated along the railway lines.

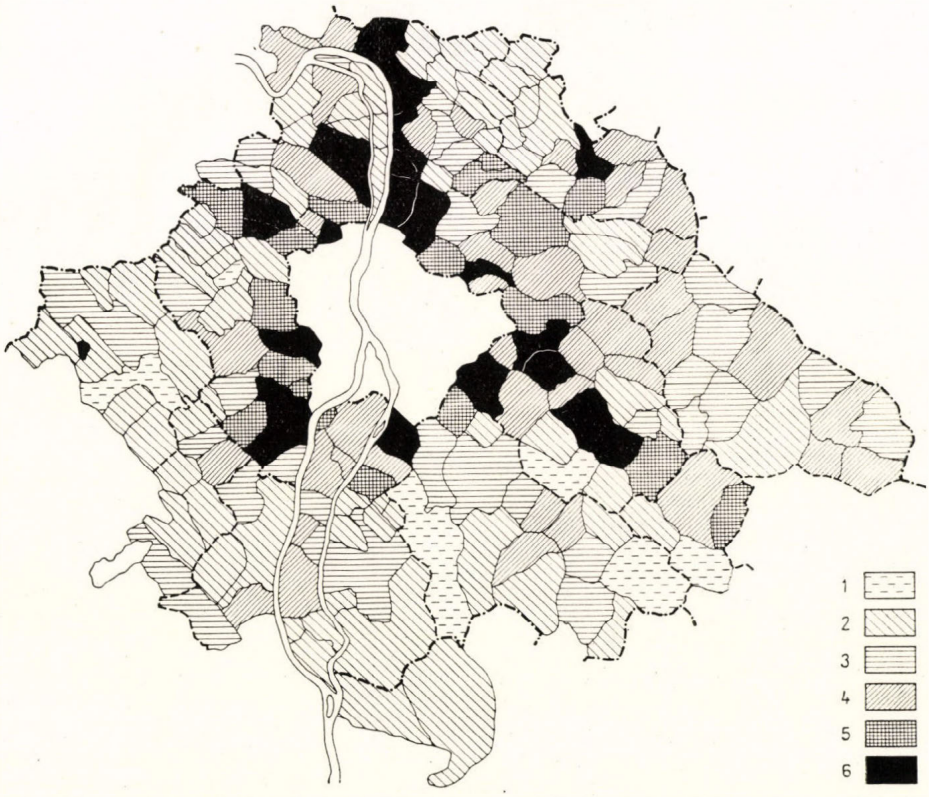


Fig. 18. Population density of the commuter zone of Budapest in 1949 (legend in Fig. 16)

The *economic transformation* of the zone can be seen in the enormous change both in population density and occupational structure. The factor bringing about the economic changes is hard to discover. Only a fraction of industrial working places can be found there. Although in comparison with 1900 changes have occurred in the industrialization of the area, existing industry cannot yet provide employment to more than one-third of the workers in industry. In 1960 the number of workers in factories in the commuter zone was about 35,000 which had risen to more than 45,000 by 1970 compared with a total number of 180,000 industrial workers. The number of workers in the factories of Budapest amounted to more than 600,000 compared with 494,000 resident industrial workers, of which 40,000 were in cooperative shops and 24,800

Fig. 19 Population density of the commuter zone of Budapest in 1960 (legend in Fig. 16)

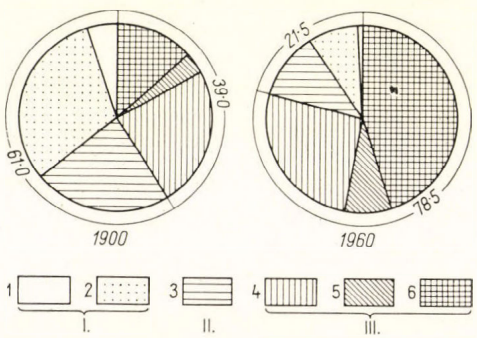


Fig. 20. The relationship between population density and commuters
1 = below 40; 2 = from 40 to 75; 3 = from 75 to 100; 4 = from 100 to 150; 5 = from 150 to 200; 6 = above 200 persons per sq.km. Percentage of commuters in total population: I = below 15; II = from 15 to 50; III = above 50

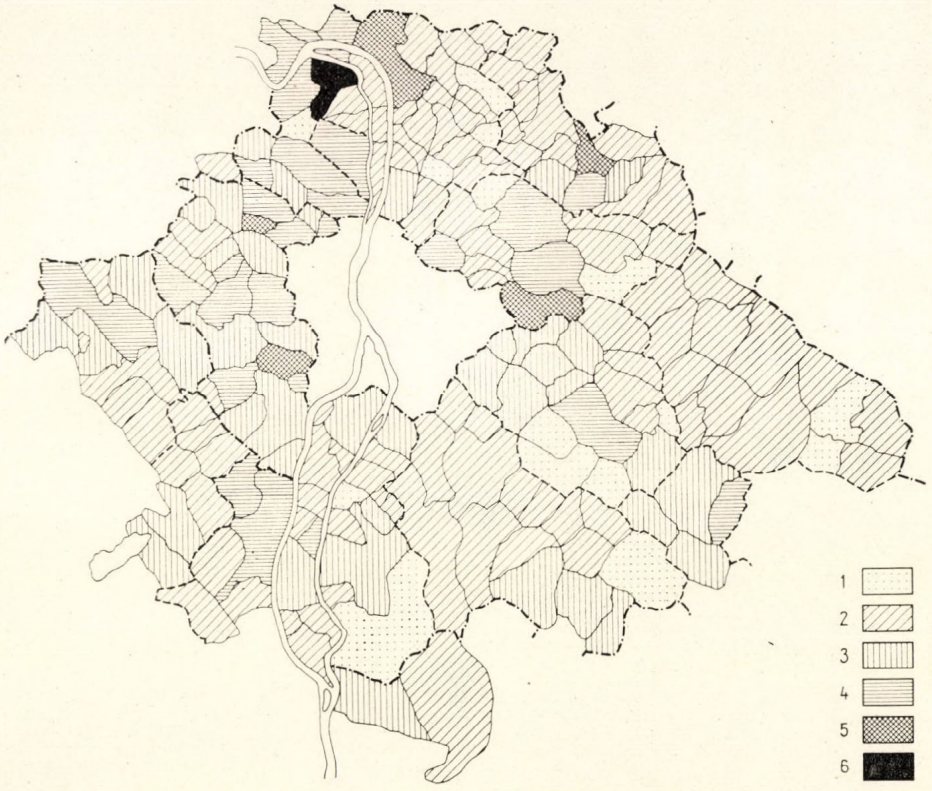


Fig. 21. Growth of settlements in 1900 through migration
1 = below 5; 2 = from 5 to 15; 3 = from 15 to 25; 4 = from 25 to 40; 5 = from 40 to 60; 6 = above 60 per cent

independent tradesmen. Thus the number of wage-earners employed in the industrial plants was larger than the number of resident workers (Table XIX).

It follows that 14·1 respectively 18 per cent of the workers in the industrial plants of Budapest are commuting. In 1960 the total number of commuters was about 140,000. In 1968 that number increased to 160,900, of which 101,700 worked in the state engineering industry alone, 98·5 per cent of all workers in the manufacturing and building industries live and work in Greater Budapest. By comparison only 18·2 per cent of the workers living in the commuter zone work in their place of residence. Of the commuters 69 per cent work in Budapest, and 12·8 per cent in factories in the commuter zone. In addition to industrial commuting, commuting to commercial, transport, public services and other places of work is considerable. About 40 per cent of the workers commuting to Budapest are so employed.

Commuting is greatest from settlements where the growth and density of population and the proportion of industrial population are highest. These

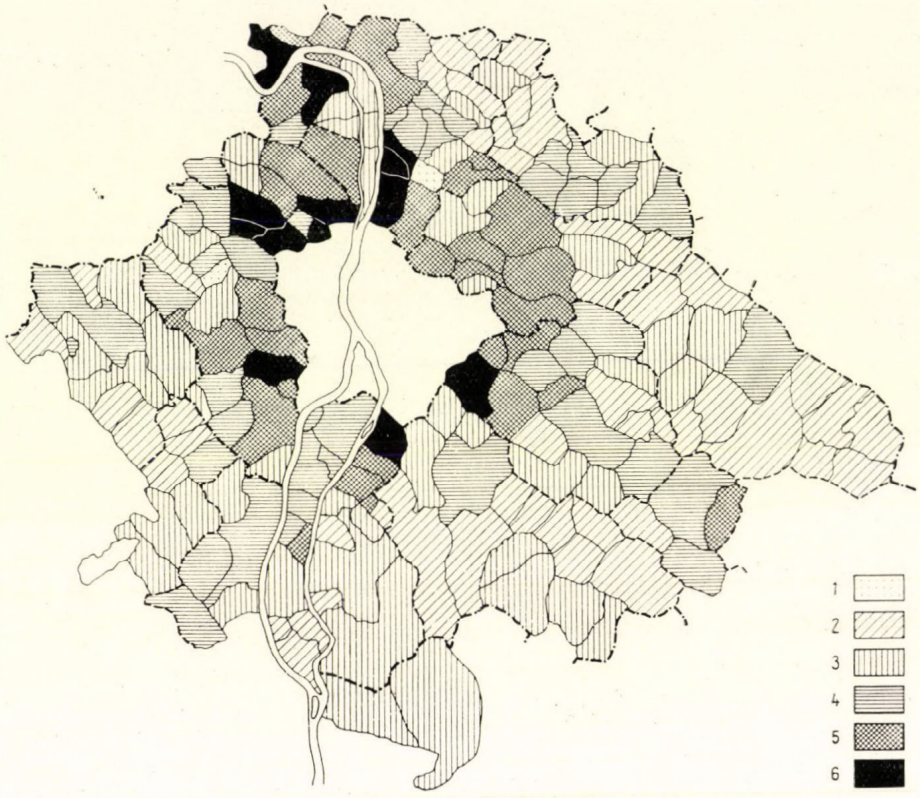


Fig. 22. Growth of settlements in 1930 through migration (legend in Fig. 21)

Table XIX

The distribution of gainfully employed workers in Budapest, in 1960 and 1968

Occupational branch	Total number (in thousands)		Proportion of commuters			
			number		percentage	
	1960	1968	1960	1968	1960	1968
Total	1,195	1,278	139,402	160,900	11·7	12·6
Industry	591	628	83,627	101,700	14·1	16·2
Building industry	105	111	12,227	9,400	11·5	8·5
Communications	109	148	22,557	23,700	20·6	16·1
Commerce	125	120	8,418	11,500	6·7	9·6
Agriculture	13	23	931	3,000	7·3	13·0
Services	83	248	4,482	11,600	5·4	4·7
Miscellaneous	169		7,160		4·2	

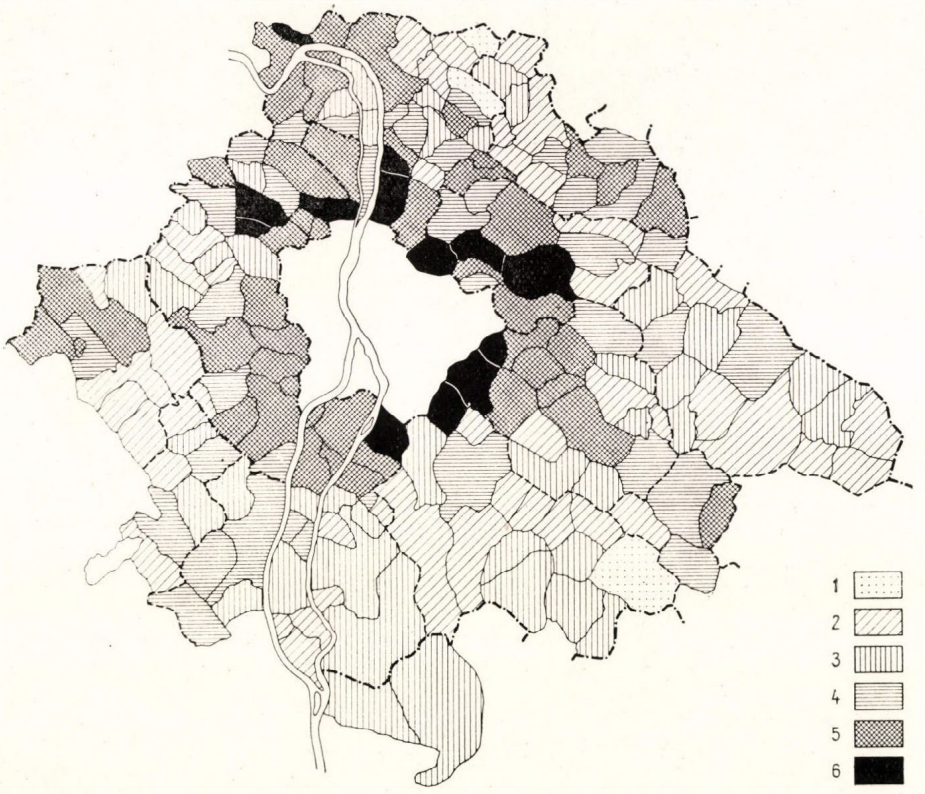


Fig. 23. Growth of settlements in 1949 through migration (legend in Fig. 21)

settlements are close to Budapest and have good transport connections. More than three-quarters of the industrial workers and commuters in the zone are clustered in settlements along the railway lines (Fig. 25). The share of the Great Plain in this is remarkably high, owing to the extension of the commuter zone into the area and the better communications situation. Budapest is the starting point of 11 railway lines, 3 suburban (HÉV) lines and 7 international and 5 other public roads. Seven of the main and two of the suburban railway lines and four main roads lead directly to the Great Plain, or pass through it. Additionally, commuter trains are frequent to and from the Great Plain. 80 per cent of commuters are transported by the railways of the Great Plain. Thus, between 20,000 and 25,000 workers use the Cegléd–Budapest line, more than 15,000 the Nagykáta–Budapest, 10,000 each Vác–Budapest–Hatvan–Budapest railway lines. From settlements along the railway lines in Transdanubia commuting is less considerable, except from Érd which is close to Budapest. The number of commuters is generally not more than 5000 on each line although from Érd alone more than 7000 arrive into the capital by rail.

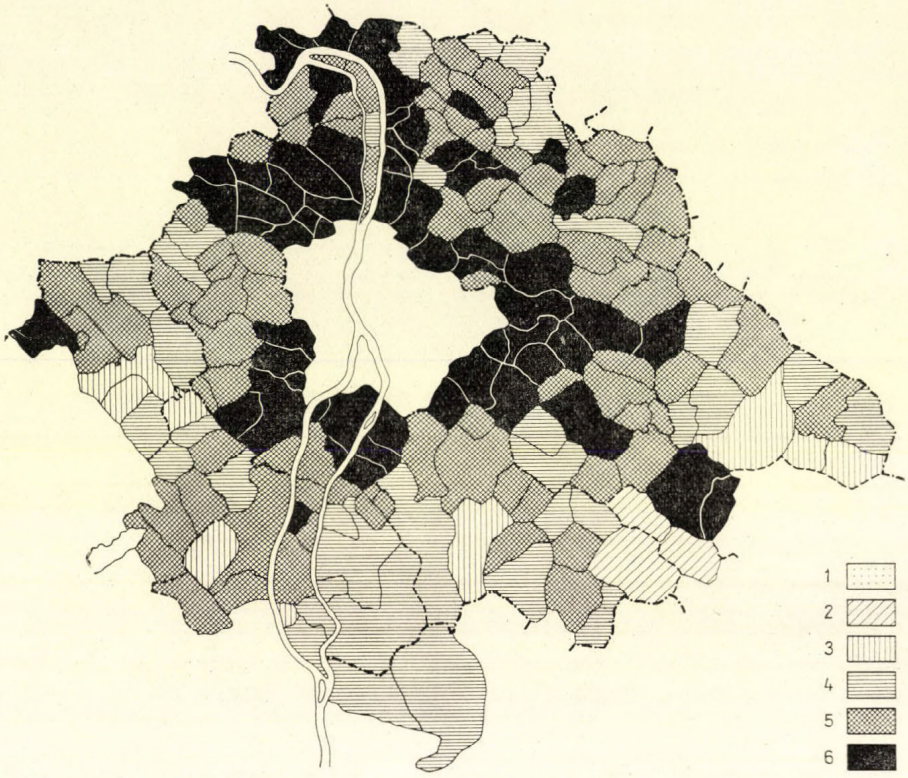


Fig. 24. Growth of settlements in 1960 through migration (legend in Fig. 21)

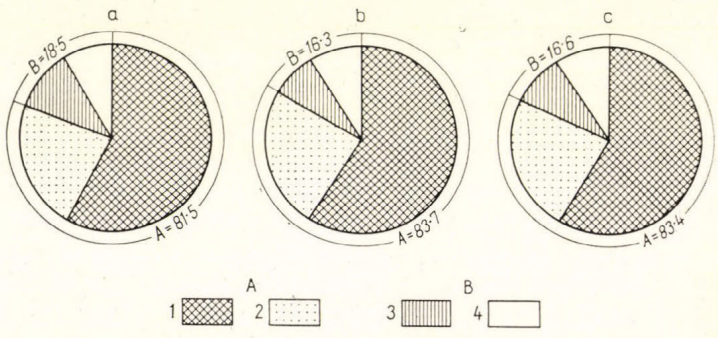


Fig. 25. Distribution of commuters
a = commuters; b = industrial wage-earners; c = distribution of commuters according to the location of settlements. A = settlements by railway lines: 1 = on the Great Plain; 2 = in Transdanubia. B = settlements without railway lines: 3 = on the Great Plain; 4 = in Transdanubia

Suburban railway lines play a minor role, although a considerable number of commuters from the above-mentioned settlements use them in preference to the national railways. For instance, many of them change to suburban trains on the Gödöllő and Ráckeve lines. The four suburban lines carried 16·6 per cent of the commuters to Budapest in 1960. The role of suburban lines is more considerable in the Great Plain and two-thirds of commuters from settlements along the Gödöllő and Ráckeve lines arrive by HÉV. The Gödöllő and Ráckeve lines each carry more than 7000, and the Szentendre line more than 5000 commuters daily to the capital. On the Budaörs and Törökbálint lines the number of commuters is smaller—though not less than 7000—because bus services are more popular (Fig. 26).

The proportion of commuters travelling by bus is small, comprising about 15 per cent of the total number. Bus services play a primary role in commuting from settlements distant from railway lines, the number being especially considerable from settlements in the Buda regions. Many commuters use the bus services from settlements which have one or more railway stations but which are adjacent to the capital from where buses are frequent and not costly. Buses play a greater role in local transport services connecting settlements with the nearest railway station. This allows commuting from settlements with relatively bad transport connections.

From many settlements within 25 to 30 km of Budapest the number of commuters exceeds 1000 and in some places is even greater. In this zone there are hardly any undeveloped settlements with bad transport connections where the number of commuters is below 100 and their proportion below 25 per cent. The number of commuters is increasing annually, of late particularly from settlements situated south of Budapest which have until recently retained their agricultural character.

The economic character of settlements situated south of Budapest between the Cegléd railway line and the Danube is changing. New commuter communities have been formed on the outskirts of the settlements situated nearest to Budapest. From the new communities formed on the outskirts of the more distant settlements commuting began later, and is at present steadily growing.

Though the commuter zone of Budapest extends up to 60 km from the city more than half of all commuters travel less than 30 km to their place of work. The greatest number travel from Vecsés and Érd to Budapest, most of the 6–7000 commuters from the two communities arriving in the capital by train, while many commute daily from other settlements near Budapest, for instance, more than 2000 each from Gödöllő and Dunakeszi both of which possess considerable industries. The number of commuters from Dunaharaszti, Budaörs, Monor, Gyömrő, Fót, Pécel and Budakeszi is about 3000 in each case and from Pilisvörösvár, Törökbálint, Üllő, Gyál, Ócsa and Szigetszentmiklós it exceeds 2000. From more distant settlements, situated along railway lines such as Pilis, Albertirsa, Veresegyháza, Isaszeg, Biatorbágy, Pomáz, Szentendre, Tárnok, Tápiószecső, Nagykáta and Mende, the number of commuters is at least 1000 persons.

The areal distribution of commuters follows a zonal arrangement which varies according to occupational structure. Of the 824,182 manual workers employed in Budapest 122,745, or 14·9 per cent are commuters. The number of white

collar workers is 333,702, of which not more than 5 per cent, namely, 16,657 are commuters. Many skilled workers and those employed in administrative, cultural, health and other occupations commute from communities and residential quarters neighbouring the capital. *Transport workers* who observe a time-table different from the normal and who enjoy special travel benefits often come from distant places. There are communities on the fringe of the commuter zone, located along railway lines where the proportion of the population working in transport surpasses the 5 per cent average and in some places reaches 30 to 35 per cent. A large number of workers commute from communities and towns outside the recognized commuter zone but which are connected with Budapest by fast train services. More than one-fifth of the 109,266 workers in the transport industry in Budapest are commuters.

Mainly *unskilled workers* with low earnings and *workers in the building industry* are commuting from distant or from inaccessible settlements, temporary migration and irregular commuting being widespread in the building industry. The attraction of labour to the building industry is considerable outside the examined area, for instance, from the western half of County Nógrád, and from the eastern regions of the country.

The travelling distance is modified when it is taken into consideration that the final destinations of commuters are not the town centres but the industrial belts, many train commuters *getting off at the railway stations in the suburbs* which are usually in or in the vicinity of the industrial belts. From there they get to their places of work by tram. Generally they are employed in plants situated in the neighbourhood of the railway lines although a few find employment in districts farther away. It occurs frequently that many commuters from a particular community are engaged in the same factory. Such factories are usually situated in or near to the outer industrial belt, whereas the residential communities are situated along the railway lines.

It should be noted that this phenomenon stimulated a further investigation by the author, which was performed with the help of the Budapest branch of the Central Statistical Office through its Records for 1968. The author selected 33 plants representative of the regional and sectoral distribution of industry. The 26,000 people who travel daily to the 33 plants make up some 25 per cent of all commuters employed in industry. It was found that the *area of labour attraction is zoned in a similar way to places of work.* The labour attraction of plants in different industrial belts acts most intensely on that zone with which it is in direct contact. Exceptions to this rule are those plants which are centrally located and which therefore act over the whole labour attraction area (Tables XX, XXI, Fig. 27). Moreover, the more peripheral the plants, the more concentrated the dwelling places of commuters. For example, 300 commuters travel daily from 66 settlements to a shoe factory located in the vicinity of the centre, while a similar number of commuters travel from only 17 settlements, linked directly to a peripherally located textile factory. The dispersion value of the dwelling places of commuters is 4·8 in the first case, and 18·1 in the second.*

* Földrajzi Értesítő 1971—72, pp. 131–152.

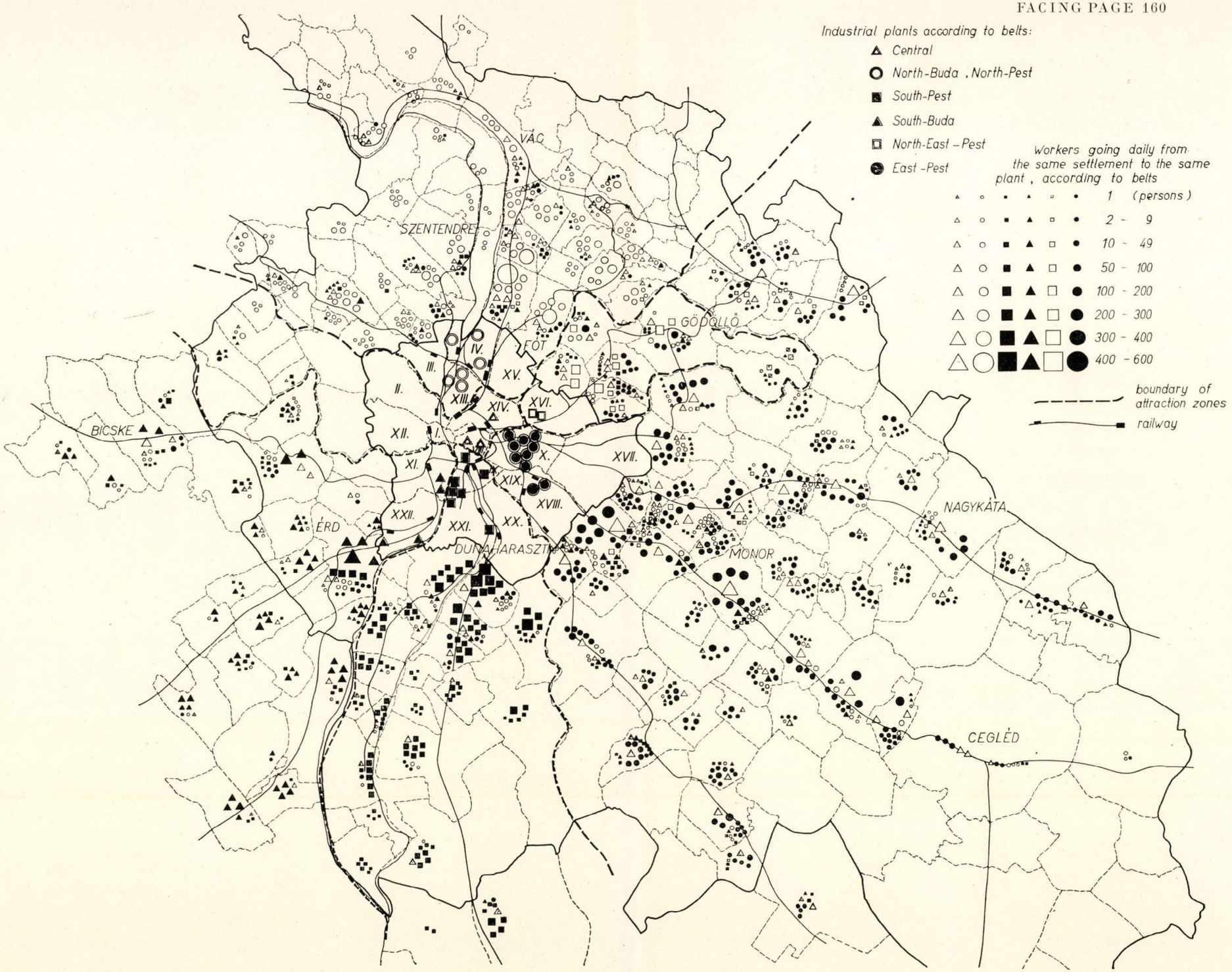


Fig. 26. The distribution of commuters employed in certain industrial zones in Budapest by place of residence
1 = the number of commuters from a given settlement to a given place of work; 2 = places of work examined; 3 = the boundary of the commuter zone; 4 = railway

TABLE XX

Distribution of commuters resident in different zones of attraction according to working places

Working place / Dwelling place	Central 3	E-Pest 10	S-Pest 7	Northern 7	S-Buda 4	NE-Pest 2	Total 33
	Percentage of commuters						
E-Pest	34·7	57·9	1·2	3·2	0·9	2·1	100·0
S-Pest	7·2	1·8	89·5	0·5	0·9	0·1	100·0
Northern	4·4	1·6	0·7	92·1	1·0	0·2	100·0
S-Buda	12·5	3·1	4·5	2·3	77·4	0·2	100·0
NE-Pest	13·8	14·5	1·5	3·0	0·9	66·3	100·0
Remote and unnamed settlements	24·6	48·8	9·8	5·5	10·5	0·8	100·0
Total	20·9	30·1	13·4	21·1	10·1	4·4	100·0

The number of industrial enterprises in the commuter zone is about 800 employing 155,000 workers. *The attraction of industrial centres within the zone* encompasses small areas only and is merely of secondary importance. Only *Vác*, *Szentendre*, *Pilisszentiván*, *Dunakeszi*, *Gödöllő* and *Szigethalom* have formed their own commuter zones, but even from each of these places nearly 2000 workers commute to Budapest daily. At the same time they also attract labour from Budapest, and about 10 per cent of the workers in their factories are inhabitants of Budapest. Commuters from Budapest work in the educational, administrative and other fields, their ratio being highest in Szigethalom where they amount to about 30 per cent.

TABLE XXI

Distribution of commuters' working places according to place of residence

Working place / Dwelling place	Central 3	E-Pest 10	S-Pest 7	Northern 7	S-Buda 4	NE-Pest 2	Total 33
	Percentage of commuters						
E-Pest	79·3	92·4	4·4	7·2	5·0	22·5	48·0
S-Pest	4·6	0·8	89·0	0·3	1·3	0·1	13·3
Northern	4·3	1·1	1·1	90·2	2·1	0·9	20·7
S-Buda	7·0	1·2	4·2	1·2	89·8	0·3	11·7
NE-Pest	3·3	2·4	0·4	0·7	0·5	75·9	5·0
Remote and unnamed settlements	1·5	2·1	0·9	0·4	1·3	0·3	1·3
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Fig. 27. The attraction of labour to Greater Budapest in 1960
1 = railway lines; 2 = bus lines; 3 = 2–3000 commuters.

The industrial enterprises associated with these other centres are situated north of Budapest, except those in Szigethalom and Százhalombatta (Fig. 28). Besides these two Vác, Dunakeszi, Szentendre and Gödöllő are most important. The southern and eastern parts of the commuter zone of Vác complete that of Budapest. The labour attractive zone of Budapest extends, however, beyond Vác along the railway lines, although commuters from settlements in South-Nógrád and North-Pest, without railway connections, consider Vác as their labour centre. The other labour attraction settlements are centres of secondary character and their industry may be regarded as an extension of that of Budapest.

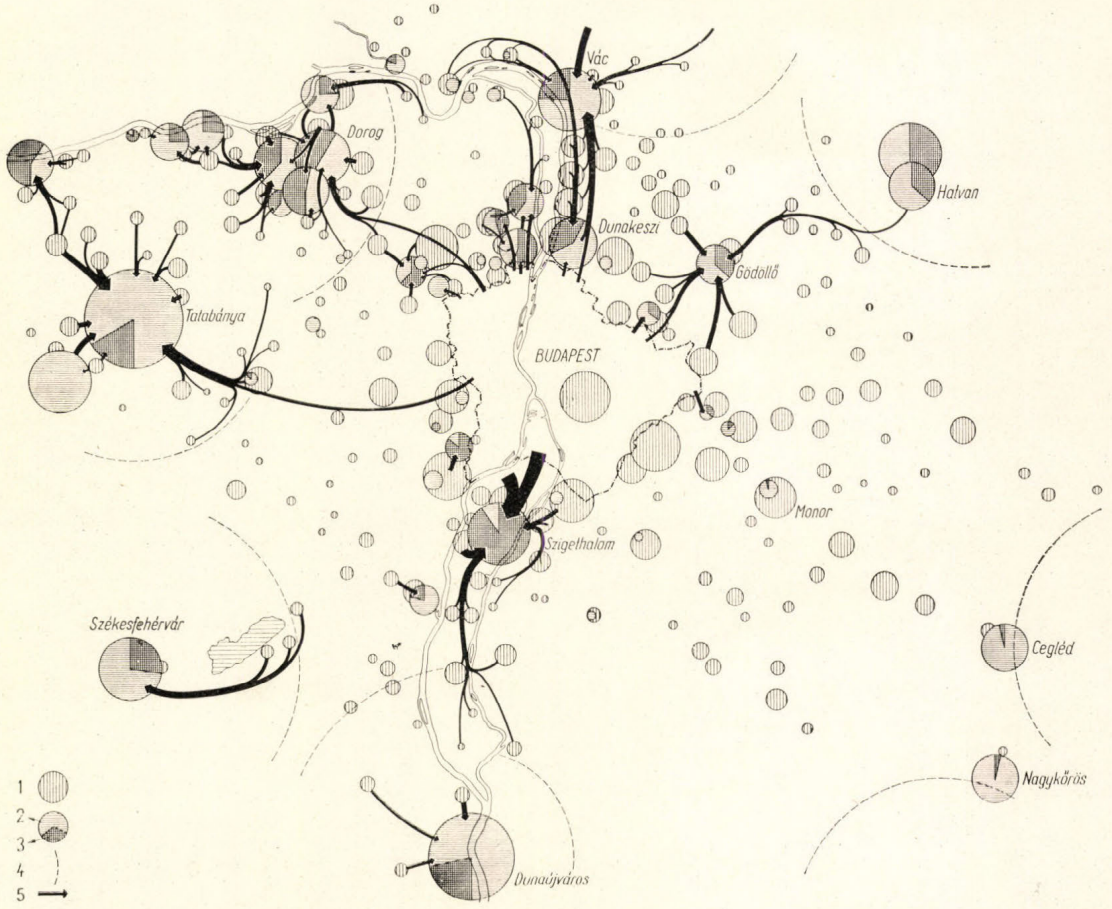


Fig. 28. The commuter zone of Greater Budapest in 1960
1 = number of commuters; 2 = attraction centres on the basis of labour employed; 3 = ratio of commuters; 4 = attraction spheres of neighbouring centres; 5 = migration trends outside Budapest

SUMMARY

Communications play a considerable role both in the location of working places and the distribution of population. From population research it is apparent that in the labour attraction centre various areas of working place or of residential character and in the commuter zone the settlements have developed according to the quality of transport connections.

The evolution of the population of Hungary and of the towns is by and large due—as all over the world—to the development of the means of production, and to the improvement in cultural and health conditions. That compared with the relatively small area and population of the country such a vast urban agglomeration developed, is due to the specific industrialization process in Hungary.

BIBLIOGRAPHY

Acsádi, G. (1956) A népesség belső vándorlása (Internal migration of the population). *Stat. Szle.*, Vol. 34, No. 3, 451–462.

Bartke, I. and Kóródi, J. (1967) A budapesti és a Pest megyei ipar fejlődésének problémái (Industrial development problems in Budapest and Pest County). *Megyei és Városi Stat. Ért.*, Vol. 17, No. 7, 317–327.

Bárány, L. and Korbuczki, I. (1962) A környékről Budapestre bejáró dolgozók közlekedésének lehetőségei és egyes problémái (Transport problems of workers commuting to Budapest from the suburbs). *Megyei és Városi Stat. Ért.*, Vol. 10, No. 11, 537–551.

Bencze, I. (1963) Budapest gyáripara (The manufacturing industry of Budapest). *Földr. Közl.*, Vol. 88, No. 2, 101—127.

Berend, T. I. and Ránki, Gy. (1955) *A monopolkapitalizmus kialakulása és uralma Magyarországon 1900–1944* (Formation and dominance of monopoly capitalism in Hungary 1900–1944). Kossuth Könyvkiadó, Budapest, 95.

Berend, T. I. and Ránki, Gy. (1961) *A Budapest környéki övezet kialakulásának és fejlődésének kérdéseihez.* (On the formation and growth of the industrial belt around Budapest. Studies. from the past of Budapest). Akadémiai Kiadó, Budapest, Vol. 14, 535–573.

Bora, Gy. and Kóródi, J. (1959) A népesség, a munkaerő és az ipar területi koncentrálódása és a fővárosi túlzsúfoltság (The territorial concentration of the population, labour force and industry and the overcrowdedness of the capital). *Közg. Szle.*, Nos 8–9, 892–907

Bodor, A. (1954) Budapest hatása környékének településeire (The influence of Budapest on the surrounding settlements). *Földr. Ért.*, Vol. 3, No. 4, 734–755.

Haltenberger, M. (1942) *Budapest városföldrajza* (The urban geography of Budapest). Stephaneum Nyomda, Budapest, 160.

James, E. and Vance, J. Jr. (1960) Labour-shed employment field and dynamic analysis in urban geography. *Economic Geography*, Vol. 36, No. 3, 189–220.

Kóródi J. and Márton, G. (1968) *A magyar ipar területi kérdései* (The territorial problems of the Hungarian industry). Kossuth Könyvkiadó, Budapest, 176.

Lettrich, E. (1962) Az ipari települések terület komplexumai Magyarországon (The areal complexity of industrial settlements in Hungary). *Földr. Ért.*, Vol. 11, No. 1, 85–109.

Lettrich, E. (1964) Urbanization in Hungary in the light of the occupational structure of her population. *Applied geography in Hungary.* Akadémiai Kiadó, Budapest, 164–178.

Lijewsky, T. (1967) *Dojazdy do pracy w Polsce* (Commuting in Poland). Studia 15. KPZK PAN Warszawa, 202.

Mačka, J. (1962) K otazce struktury dojedemi do prace "*Sbornik čs. spol. zemepisné*", No. 4, 303–324.

Markos, Gy. (1962) *Magyarország gazdasági földrajza* (The economic geography of Hungary). Közgazdasági és Jogi Könyvkiadó, Budapest, 582.

Mendöl, T. (1942) A városföldrajz népességtudományi vonatkozásai (Demography and urban geography). *Stat. Szle.*, Vol. 20, Nos 5–6, 346–350.

Mendöl, T. (1963) *Általános településföldrajz* (General settlement-geography). Akadémiai Kiadó, Budapest, 567.

Mohs, G. (1964) Die Bevölkerungs- und Siedlungsentwicklung im Ballungsgebiet Halle–Leipzig. "*Wissenschaftliche Veröffentlichungen des Deutschen Instituts für Länderkunde*" Neue Folge 21/22 Leipzig, 313–346.

Palotás, Z. (1965) Der Pendelverkehr Ungarns. *Raumordnung und Raumforschung*, Vol. 23 No. 4, 222–236.

Pápai, B. (1958) Budapest túlnépesedéséről (On the overpopulation of Budapest). *Megyei és Városi Stat. Ért.*, Vol. 6, No. 12, 541–555.

Pápai, B. (1967) A budapesti agglomeráció (The metropolitan area of Budapest). *Demogr.* Vol. 10, No. 1, 69–86.
Pécsi, M. and Sárfalvi, B. (1964) *The Geography of Hungary*. Corvina, Budapest, 300.
Mrs. Pesti, L. (1969) A migráció szerepe Budapest munkaerő-ellátásában (The role of migration in Budapest). *Ter. Stat.*, Vol. 19, No. 1, 58–79.
Ruisz, R. (1959) Az iparfejlesztés hatása a magyar városok fejlődésére (The influence of industrial development on Hungarian towns). *Földr. Ért.*, Vol. 8, No. 3, 337–355.
Sándor, V. (1954) *Nagyipari fejlődés Magyarországon 1867–1900*, (The development of large-scale industry in Hungary, 1867–1900). Kossuth Könyvkiadó, Budapest, 771.
Sándor, V. (1958) *A tőkés gazdaság kibontakozása Magyarországon, 1849–1900* (The development of capitalist economy in Hungary, 1849–1900). Kossuth Könyvkiadó, Budapest, 107.
Sárfalvi, B. (1965) *A mezőgazdasági népesség csökkenése Magyarországon* (The decline of the agricultural population of Hungary). Akadémiai Kiadó, Budapest, 122.
Schliebe, K. and Teske, H. D. (1970) Verdichtungsräume — eine Gebietskategorie der Raumordnung. *Geographische Rundschau*, Vol. 22, No. 9, 347–352.
Schöller, P. (1956) Die Pendelwanderung als geographisches Problem. Berichte 2. dt. *Landeskunde*, Vol. 17, No. 2, 254–265.
Staubach, H. (1962) *Pendelwanderung und Raumordnung*. Westdeutscher Verlag, Köln, 108.
Szabady, E. (1962) A budapesti városrészek népsűrűsége, foglalkozási és kulturális összetétele (Population density and the occupational and cultural composition of the districts of Budapest). *Stat. Szle.*, Vol. 11, No. 11, 1112–1130.
V. Tajti, E. (1958) Népességföldrajzi vizsgálatok a Duna–Tisza közén (Population geography investigations in the Danube–Tisza Interfluve). *Földr. Ért.*, Vol. 8, No. 2, 250–257.
V. Tajti, E. (1962) Budapest munkaerővonzása (The manpower attraction of Budapest). *Földr. Közl.*, Vol. 88, No. 3, 255–277.
V. Tajti, E. (1968) A női munkaerőforrás területi eloszlása és hasznosításának sajátosságai (The territorial distribution of the female labour source and the characteristics of its use). *Földr. Ért.*, Vol. 17, No. 3, 345–357.
V. Tajti, E. (1971) A munkahely és a lakóhely közötti térbeli kapcsolat alakulásának tendenciái a budapesti agglomerációban (Tendencies of the spatial interaction between working and dwelling places of the Budapest agglomeration). *Földr. Ért.*, Vol. 20, No. 2, 131–152.
Thirring, L. (1942) A lélekszám alakulása a főváros környékén (Population growth in the vicinity of the capital). *Stat. Szle.*, Vol. 20, No. 7, 381–402.
Tóth, J., Krajkó, Gy. and Pénzes, I. (1969) Einige Fragen der Szegeder Agglomeration. Die Lage und die ökonomische Entwicklung von Szeged. *Acta Geographica Supplementband*, Szeged, 3–28.
Vagács, A. (1958) Településföldrajzi gondolatok Budapestről (Problems of settlement geography in Budapest). *Földr. Ért.*, Vol. 7, No. 4, 503–518.
Zala, Gy. (1958) Magyarország ipari dolgozóinak ingavándorlása (Industrial commuting in Hungary). *Földr. Közl.*, Vol. 84, No. 3.
Ziegler, H. (1964) Die beschäftigten Einzugsbereiche der Grossbetriebe in München. *Münchner Geogr. Hefte*, Regensburg, No. 25, Kallmünz, 132.