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THE MEASUREMENTS OF CONCENTRATION OF INDUSTRY AND POPULATION IN CZECHOSLOVAKIA

K oblastní koncentraci průmyslu a osídlení v Československu. — Poměry rozmístění československého průmyslu lépe charakterizuje „celkový stupeň industrializace oblastí", který je stanoven na základě specifické plochy, z níž byla vypočtena specifická hustota obyvatelstva, velikosti, hrubé intenzity, hustoty a specifické hustoty průmyslu. Specifickou plochu tvoří zemědělsky a stavebně využitelné plochy. Průměrně se tím zmenšuje území okresů o 36,7 %. Specifická hustota obyvatelstva odstraňuje nežádoucí rozdíly pokud jsou způsobeny rozdílnou strukturou ploch. Celostátnímu průměru 107 obyv./km² odpovídá 170 obyv./km²sp. Regionální vztah rozmístění průmyslů a obyvatelstva je v ČSSR těsný. Sledujeme-li velikost průmyslu všech odvětví celkem $Vp = \Sigma_{pp1-15}$, lze říci, že rozmístění je již značně rovnoměrné ve srovnání s podmínkami geografickými i s poměry v zahraničí. Hrubá intezita průmyslu $Ip = \frac{pp}{1000 \text{ obyv.}}$ činí v průměru republiky 161. Průměrné hustotě průmyslu $Hp = \frac{pp}{10 \text{ km}^2} = 173$ odpovídá specifická hustota průmyslu $Hp/sp = \frac{pp}{10 \text{ km}^2/sp} = 236$.

Ve srovnání se sousedními zeměmi je u nás stupeň regionální industrializace značný. Nejnižší stupeň vykazují okresy Tachov, Prachatice, Znojmo, 6 okresů na západním a 6 na východním Slovensku. K nim se druží Dol. Kubín a Rim. Sobota a do jisté míry Lounsko, Domažlicko, Nitransko a Břeclavsko. Industrializaci je třeba zaměřit zvláště tam, kde tyto okresy mají dobré polohové, přírodní, dopravní a další podmínky a tvoří souvislejší oblast. Maximální stupeň industrializace je již překročen na Jablonecku, Mostecku a Ostravsku, dosažen na Teplicku a Brněnsku a blíží se mu ještě 14 okresů v Čechách na Moravě i na Slovensku.

Demands for application of the geographical, especially of economic geographical research appear in the planed economy very often. These tendencies are generally marked by trying to find a more exact typological and quantitative expression in geographic works and in their cartographical supplements.

In 1960 the districts of Czechoslovakia have been enlarged in order to correspond better to conception of representation the economic units of an industrial country. The average area of these districts is about 1 300 sq. kms (if the biggest towns are included in the surrounding districts), beeing so similar to that of the „powiats" in Poland (average area — 1 053 sq.kms.) or „arondissements" in France (average area — 1450 sq.kms.).

In a country with such a variable surfice and a dispersed industry and

population as Czechoslovakia, these large districts are of course very different from the geographical point of view. The scientific value of simple statistical data as e.g. the density of population, the density of industry etc. is limited, because as the result appear average numbers of large and asymetric variations. However, it is often necessary to characterize the district as a whole with one or several convenient quantitative indexes.

For this reason we have tried to derive a complex index for the measurement of the total *degree of regional industrialisation* in the relation to the area and settlement. The degree of regional industrialisation is based on the specific area which was used for the calculation of specific density of population, on the magnitude of industry, rough intensity, density and specific density of industry.

Specific area (sq.km. sp.) is determined for Czechoslovakia as a total area useful for agriculture or building i.e. even for industry and settlements. Thus the woods, mountains and some other terrains are excluded, being not of interest for a more intensive economic use for settling of population. The specific area is the starting relation for stating the regional differences in the density of settlement and industry. By the use of this index the territory of an average district is reduced by 36,7% but in many districts the reduction is much greater: e.g. Prachatice by 51,6%, Jablonec n. N. by 56,3%, Vsetín by 57,5%, Banská Bystrica by 61,1%, Rožňava by 61,7%.

The density of population for sq.km has been based on the specific area. This *specific density of population* removes the undesirable sharp differences in the density of population, as long as they are caused by a different structure of the district areas. A more perfect expression of the territorial composition of the population, which was used even before by some authors, can be especially useful for considerations about the distribution of production, industrialisation and working-power reserves in various regions of the country. For the whole national territory the density of 107 inhabitants/sq.kms. corresponds to the specific density of some 107 inhabitants/sq.kms.

The regional relation between the distribution of industry and population is very narrow in Czechoslovakia. If we measure the magnitude of industry by summing up numbers of workers (Vp = pp) of all the represented branches according to the different localities, we are able to watch the degree of industrialization not only by the density of industry, or by the specific density of industry, but even by the intensity of industry.

Examining the *magnitude of industry* we observe, that, with exception of 6 districts, in the whole territory of Czechoslovakia the industry is today clearly represented. This representation is most weak in Velký Žitný ostrov (The Danube Island), but this region lies in the tight neighbourhood of the first Slovak industrial centre Bratislava. Other regions relatively less industrialized are the frontier territories of Tachov and Prachatice in the western

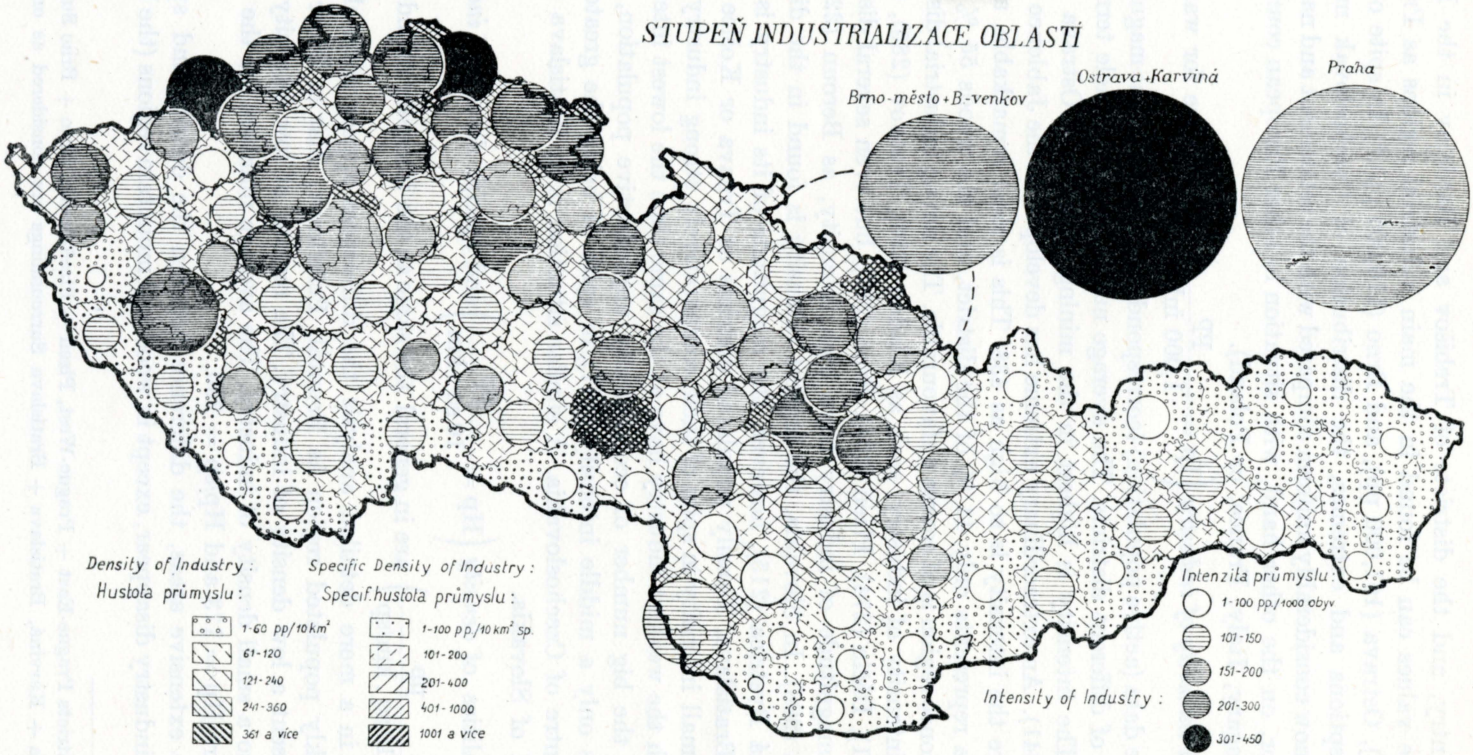
part of country, and the districts of Trebišov and Bardejov in the East. The extreme values can be found in the main industrial regions as Prague (178,000 pp), Ostrava (161,000 pp), and Brno (110,000 pp).*) In spite of the quoted exceptions and extremes, the distribution of Czechoslovak manufacturing is now considerably uniform compared with the settlement and natural conditions or, on the other hand, with situation in other European countries (e.g. in Hungary, Italy, France, or Poland).

The *rough intensity of industry* $\left(\mathrm{Ip} = \frac{\mathrm{pp}}{1{,}000\ \mathrm{inh.}}\right)$ that we use for want of more precize data (active population) (corresponds only partly to the magnitude of industry of different districts. The average number for the whole territory Ip = 160. The intensity is highest in the mining districts of Ostrava (360) and Most (341). An extraordinary extreme has developed in the Jablonec n. N. region where the intensity is so high as 438. This is most remarkable, as the specific area represents only 44 % of the district, and the woods 55 %. The case of Jablonec region is of course unfavourable. The strong industrial districts have high intensity of industry, such as Kladno (286), Trutnov (285), Gottwaldov (281), Děčín (274), Plzeň (254), Brno (232), but even several districts of middle magnitude of industry have high intensity, as Beroun (223) or Česká Lípa (208). In Slovakia, the highest intensity is found in the district of Považská Bystrica (215), however, the magnitude of its industry is only second to Bratislava. Densily populated districts as Trnava or Košice have still very small intensity in spite of their comparatively strong industry. The regions with the weakest industry have at the same time the lowest intensity. Thanks to the big number of economically unproductive population, even Prague has only a middle intensity (177), in spite of being the greatest industrial centre of Czechoslovakia. A similar situation is in Bratislava (124), the capital of Slovakia.

The qualities of *density* $\left(\mathrm{Hp} = \frac{\mathrm{pp}}{10\ \mathrm{sq.\,km}}\right)$ and *specific density of industry* $\left(\mathrm{Hp/sp} = \frac{\mathrm{pp}}{10\ \mathrm{sq.\,km/sp}}\right)$ are in general the same as the intensity of industry. Of course in a more detailed analysis the differences appear more clearly. Some weakly populated region as Bruntál, Pelhřimov, Žiar n. H. or Strakonice present a low density of industry. The regions of low intensity have usually also a small density of industry. The average numbers for the whole territory are Hp = 173 and Hp/sp = 236.

In more extensive areas, the difference between the density and specific density of industry disappear, except in wood and mountain regions (the Upper

*) The districts Prague-East + Prague-West, Plzeň + Plzeň-South, Brno + Brno Surroundings, Ostrava + Karviná, Bratislava + Bratislava Surroundings are considered as one unit.



Total Degree of Regional Industrialization

Hron Valley, Moravian-Silesian Beskydy, Javorníky Mountains, etc.). The lowest specific density of industry can be found in the East and South of Slovakia even in the districts with greater towns and more dense population as Prešov (70), Komárno (60), and Nové Zámky (50). In the western half of the country the same condition appears in the frontier districts of western and southern Bohemia and southern Moravia, and what is surprising, even in the district of Louny (90). The maximum specific density has been found out, apart from Prague, in those industrial districts which have a strong nodal centre, as the district of Brno (1,300), Ostrava (4,030), Most (1,250), Teplice (1,120), and Jablonec n. N. (2,080).

The *total degree of industrialisation* is a cartographical construction depending on combination of this various mentioned indexes. We have tried to present a map based on the reveals, the difference of both magnitude and character of industrialization in different parts of the national territory. Compared with the neighbouring countries, the degree of regional industrialization is considerable. In 1960 the districts with the lowest degree of industrialization were those of Tachov, Prachatice, Znojmo, and 6 districts in western and 6 districts in eastern Slovakia (including Dolný Kubín and Rimavská Sobota). To these 17 districts stay near also the districts of Louny, Domažlice, Nitra and Břeclav. It is necessary to direct further industrialization into the regions where they form compact groups of districts with a lack of job opportunities in manufacturing. Many of them have favourable position, natural and transport conditions (e.g. Poprad, Komárno, Nitra, Trebišov, Znojmo and others).

From our point of view, the maximum degree of industrialization has been surpassed and further absolute industrialization is undesirable in the districts of Jablonec n. N., Most, and of course Ostrava. The mentioned degree has been nearly achieved even in Brno and Teplice. The 14 other districts in Bohemia, Moravia and Slovakia are close to the state of complete industrialization too.*) As it has been mentioned above, the situation of Prague and Bratislava is specific from this point of view.

These and many other conclusions are results of fulfilling the task dealing with the regional structure of Czechoslovakia a part of the Government Plan of Research, which has been confined to and has been worked up by the Geographical Institute of the Czechoslovak Academy of Sciences. The conclusion report has been passed to the competent authorities.

*) Sokolov, Ústí n. L., Děčín, Plzeň, Kladno, Pardubice, Liberec, Semily, Trutnov, Náchod, Blansko, Gottwaldov, Vsetín, Pov. Bystrica.