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INDUSTRIALIZATION IN AUSTRIA
AND INDUSTRIAL STRUCTURE OF THE AUSTRIAN PROVINCES

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The Federal Republic of Austria with an area of 83,849 sq. km and a population of 7,022,000 people is one of the “successor states” of the Austro-Hungarian Monarchy (677,000 sq. km with 56 mill. inhabitants).

When the Monarchy was dissolved at the end of the First World War (1918), Austria lost her former close connections with the sea coast, abundant agricultural countries, rich coal fields and other mineral deposits, and important industrial districts. Of the five main regions within the area left to Austria the Eastern Alps alone occupy almost two thirds of the country, and the Granite Plateau north of the Danube, a part of the Bohemian Massif, takes up another tenth. The lowlands on the border of the highland: the northern Foreland of the Alps, the Vienna Basin, and the Foreland in the East, which have a more favorable climate, higher fertility, denser population, and better preliminary conditions for traffic and industry, cover only about one quarter of the total territory.

Austria had, therefore, to endeavour to produce more food, to increase her output of raw materials for industry, to utilize her water power potential, to reconstruct and establish her traffic system, to rebuild and build up industrial enterprises, and to organize her foreign trade relations1).

During the temporary inclusion in Germany (1938-1945), the Second World War, the occupation by the Allied Powers (1945-1955), and since 1955, when Austria became independent again, she has continued to develop her natural resources and to go her way to industrialization2).

Natural Resources The establishment of industrial and power plants, artificial lakes, roads and other constructions have gradually reduced the land used by agriculture to 49.1% of the total area of the country3). At the same time the number of people engaged in farming has decreased considerably, whereas the population has grown. On the other side the improvement of land, more rational working methods, mechanization, electrification, and other measures have made Austria more self-sufficient than before: The relation of the domestic production to the consumption of main foodstuffs has gone up to 88%4).

4) Austria produces now more than half of the fat, 79% of the bread cereals, 71% of the fruit, 91% of the vegetables, almost all the meat and eggs, and all the potatoes which are consumed, and more dairy products, sugar, wine, and beer than are needed. Some meat, meet products, and dairy produce are exported.
Austrian forestry is a valuable source of raw materials and fuel. Forests cover 37.6% of the total area. Austria is the fourth supplier of timber in Europe (behind the USSR, Sweden, and Finland). At least 10.2 mill. cu. m are cut a year, of which 7.5 mill. cu. m are sawn lumber and 2.7 mill. cu. m fuel wood, mostly of coniferous trees. Logs, timber, wood pulp, paper, cardboards, fiberboards, and furniture are produced for the home demand and the foreign market.

Mining provides a very important basis for industry. The exploitation of mineral oil started in 1930 and is still concentrated in Lower Austria, northeast of Vienna (especially around Matzen and Auersthal). Recently drilling has started in Upper Austria (near Puchkirchen and Ried). With 2.5 mill. t (1959) Austria ranks third in the extraction of petroleum in Europe (without U.S.S.R.) after Romania and Germany. Austrian refineries have a capacity of 2.2 mill. t; a new refinery for 1.6 mill. t and a petrochemical plant are under construction (in Schwechat near Vienna). The output of natural gas from the oil-fields and their neighborhood (Zwerndorf) amounts to 1128 mill. cu. m (1959). Pipe lines lead to the industrial districts of the Vienna Basin, the Foreland of the Alps of Lower Austria, and Upper Styria. The main lignite deposits lie in Styria, Upper Austria, and Carinthia. Their production has doubled within the last thirty years and reaches 6.5 mill. t. Nevertheless, Austria has to import coal and oil products.

Austria has augmented the output of iron and manganese ore (3,411,000 t). It comes mostly from the Styrian Erzberg and covers about three quarters of the home demand. Lead is mined in Carinthia almost sufficient quantity. Copper from Salzburg supplies half of the domestic requirements, Austria is among the first producers of magnesite (1,221,000 t) in the world. It is produced especially in Styria and Carinthia, and is largely used for the manufacture of refractory magnesite bricks and stones most of which are exported. The output of quarry stones, talc, clay, quartzite, kaolin, and salt is rather high. Talc, graphite, and salt can be exported.

Austria has an abundant water supply and is one of the main sources of hydro-electric power in Europe. Production and consumption of energy are increasing steadily. Two thirds of the demand are provided by domestic fuels and the electric power industry. The economic potential of water power is estimated at 43 bill. Kwh per annum, one fourth of which has been developed already. The total output amounts to 14.8 bill. Kwh (1959) of which 74% come from hydraulic power plants. Almost half of the electricity is absorbed by industry, more than one tenth is exported (principally to Germany and Italy). Austria has become the leading European country in the exportation of electrical energy.

Transportation and Trade To the major factors in the distribution of industry—aside of raw materials, fuel and power, and water supply—be-
long the location of domestic and foreign markets and the facilities of transportation. Population, big cities, roads, and railways are concentrated in the lowlands and in the basins and large valleys of the mountain lands. Heavy goods are partly shipped on the Danube, chiefly through the ports of Linz and Vienna. Thanks to her central position within Europe, Austria has always been a very important transit state. Foreign trade is carried on mainly with Germany, Italy, U.S.A., Great Britain, Sweden, the Netherlands, Poland, and France.

Another essential industrial location factor is the supply of labor. The political events in the past decades and the industrial development, particularly in the western parts of the country, have caused a population shift from the eastern to the western and southern Provinces and a migration of people from mountain farmsteads and rural communities to manufacturing areas and cities, and have changed the occupational structure of the population. There is no recent census of the working population of Austria, but a comparison of the figures for 1934 (3,390,000) and for 1951 (3,347,000) indicates that the number of persons engaged in agriculture and forestry (1,224,000 in 1934 and 1,030,000 or 32.6% of all workers in 1951) is falling, that in mining, crafts, and industry (including construction) (1,204,000 and 1,367,000 or 41.3%) is rising, while that in commerce and transportation remains almost equal (421,000 and 436,000 or 13.2%).

Austria has become more and more industrialized. In 1959 mining, crafts, and industry created 55% of the gross national product of about 135 billion. Austrian shillings, whereas agriculture and forestry contributed only 11%, and commerce and transportation 15%.

A criterion of the significance of Austrian industry may be taken from the structure of her foreign trade. In 1959 imports reached the value of 29.8 billion Austrian shillings and exports that of 25.1 billion. Nearly three quarters of the exports are made up of semi-finished and finished goods, especially iron and steel, timber, machinery and apparatus, textiles and clothing, paper, cardboard, and cellulose, metal goods, chemical products, mainly nitrogen fertilizer, magnesite and magnesite bricks, aluminium, glassware, and staple-fiber.

Despite the excess of imports in the balance of trade Austria’s balance of payments shows a surplus, due, mainly, to the receipts of foreign currency from tourist traffic.

Industry Austrian industry was much developed before and during the war, especially the production of iron, steel, aluminium, and chemicals.

After 1945 war damages were repaired, the equipment modernized, and new factories founded. In 1948 the basic industries were nationalized, and oil, electric power, coal and metal mining, iron and steel industry, machinery and vehicle production, the electrical and part of the chemical industry have come under state control. Domestic raw materials, the power supply, a skilled labor force,
and capital provide the basis for different industries.

Metalurgical and metal industry together with steel and iron construction, building of mechanical and electrical machinery and equipment and of vehicles rank first in the number of persons employed and the aggregate gross value of production (26.6 bill. A.sh.). The United Austrian Iron and Steel Works (VÖFST) in Linz and the Austrian Alpine Mining Industry Company (ÖAMG) at Leonben-Donawitz in Upper Styria make Austria to one of the leading European producers of pig iron (1,840,000 t in 1959), raw steel (2,520,000 t), and rolled ware (1,720,000 t). The invention of the LD oxygen blast-furnace process makes the country far less dependent on scrap. Austria produces also various kinds of machinery, ball-bearings, vehicles, and electrical equipment. The United Metal Works Ranshofen-Berndorf A.G. at Ranshofen, Upper Austria, include one of the largest aluminium plants in Europe (production of 59,000 t in 1959).

Food and food-processing industry, production of beverages, cigarettes etc, follow in importance (11.1 bill. A.sh.). Their large number of enterprises are widely distributed over Austria.

Textile and clothing industry is second in the number of workers and ranks next in the value of the output (9.2 bill. A.sh.). Textile industry is located mainly in Lower Austria and in Vorarlberg. The clothing industry is concentrated in Vienna.

Chemical industry has become very significant within the last two decades. The Austrian Nitrogen Works (ÖSW) in Linz, one of the biggest plants of this sort in Europe, puts out nitrogenous fertilizer (882,000 t), half of which is exported, and many other products. The Lenzing Staple-fiber Company in Upper Austria owns the largest factory of its kind in Europe; 60% of the staple-fibers produced (52,300 t in 1959) are exported. Other plants manufacture sulphuric acid, soda, coke products, and other chemicals.

One of the most important branches of Austrian industry, especially as regards exports and earning of foreign exchange, comprises the wood-working industry and the manufacturing of cellulose, paper etc.

In the process of industrialization factories have sprung up everywhere in Austria, even in rather remote places and in formerly pure agrarian regions, but also in the main industrial districts of the country: in the Vienna Basin, the Foreland of the Alps of Lower and Upper Austria, the Mur-Mürz Valley and the area around Graz in Styria, and the Rhine Plain of Vorarlberg.

**Industrial Structures of Austrian Provinces** After this short survey on Austrian industry, its development, its major location factors and its main branches it remains to show how the location factors vary in the different parts of the country in their significance and interrelation and have contributed to the individual industrial structures of the Austrian Provinces.

Vienna, located at a crossroads of ancient trade routes, was for centuries the political and economic capital of Central Europe. In Austria of today it still represents the leading business, trading, banking, and consuming center of the country and the most important urban agglomeration with almost

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15) Austria's textile industry manufactures especially cotton yarns (26,000 t), staple-fiber yarns (16,000 t), cotton fabrics (17,000 t), rayon fabrics, and knitted and woven goods.

16) The output of wood pulp amounts to 153,000 t, that of cellulose to 428,000 t, of paper to 428,000 t, and of cardboard to 91,000 t.

one quarter of the total population and of all persons engaged in gainful occupations. Thanks to these facts and to the proximity of water, fuel, and power supply one quarter of the Austrian industrial output by over 30% of all the industrial operatives and the greater part of the production of quality goods are concentrated in Vienna. Among the various industries the most important one in the gross value of output is the food and food-processing industry, followed by the chemical, electrical goods, iron and steel equipment and machinery, iron and metal goods, clothing, and other industries. In terms of industrial operatives electrical goods industry ranks before the iron and steel equipment and machinery, food, clothing, iron and metal goods, and textile industries. Small and medium-sized privately-owned concerns prevail.

Lower Austria is the largest province in area and second only to Vienna in the number of inhabitants and of workers, and in industrial activity. It surrounds Vienna and forms ninterland, includes much cultivated area, and disposes of practical all the oil and natural gas. Lower Austria leads the country in the petroleum industry (near Vienna); in the textile industry, mainly in the southern Vienna Basin, around St. Pölten, and in the Waldviertel; and in the old iron-working industry in the Vienna Basin, the Foreland of the Alps, and the valleys in the Alps south of it (Eisenwurzen). Large forests furnish the material for sawmills, paper, cellulose, and wood-working factories on the rivers in and near the Alps. Important are the stone, pottery, and ceramics industry, the production of glass, chemicals, and rubber goods, and of food and beverages.

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18) 19.6 bill. A. sh. of the total gross value of 78.1 bill. A. sh. in 1957 and 177.000 out of 582,000 industrial operatives, according to figures from the business associations and the Provincial Governments.


20) Viennese industry is very variegated, but some branches are more or less concentrated here, like the production of certain foodstuffs (fats, bread, meat, dairy produce), low-tension electrical goods, elevators, refrigerating machinery, passenger buses, special metal ware, clothing, writing paper, optical goods, photographic apparatus, instruments, films, etc.

21) Lower Austria had 114,000 industrial operatives and 20% of the industrial capacity of the country in 1957.

Upper Austria\textsuperscript{23} is the fourth Province in area and number of workers. It possesses much fertile land, important lignite deposits (Hausruck), salt mines (Salzkammergut), large water power resources, mainly on the Inn, Danube, and Enns river, and a big share of Austria's industry\textsuperscript{24}. The industry is strongly concentrated in five big plants of which four, mentioned above, have been founded during the war: The United Austrian Iron and Steel Works (VÖEST) are located in Linz on the Danube over which much of the ore and coal is brought. The Austrian Nitrogen Works (ÖSW) adjoin the VÖEST and take up part of its coking gas. The United Metal Works at Ranshofen on the Inn are the biggest consumer of electric energy in Austria, utilizing principally the summer surplus for producing aluminium. The factory of the Lenzing Staple-fiber Company depends on the surrounding hardwoods. The fifth, much older plant, the Steyrwerke in Steyr, assembles passenger cars and manufactures motor-cycles, tractors, trucks, and ball-bearings. Besides, Upper Austria produces cutlery and other metal goods, machinery, leather, paper, cardboard, pulp, chemicals (on the basis of salt), textiles, and glass.

Burgenland, the third-smallest Province in size and the second in population, has little industry because of its late connection with Austria (since 1919).

Styria, the second Province in area and the third in the number of workers, is rich in forests, ilmen ore (Erzberg), lignite (mainly around Köflach), magnesite, and water power\textsuperscript{25}. Heavy industry, being in the lead, is located in the Mur-Mürz Valley, near transportation lines and the Erzberg. The biggest plant are the iron and steel mills of the Austrian Alpine Mining Industry Company (ÖAMG) at Leoben-Donawitz. Styria is dominant in the field of rolled ware, fine steel, wire and cable, and electrical goods (Weiz). The Steyr-Daimler-Puch Company near Graz manufactures motor-cars, motor-cycles, and bicycles. Styria, furthermore, accounts for 32—50\% of all cardboard, paper, and for a large part of the magnesite products.

Carinthia\textsuperscript{26}, situated on the main line to Italy, disposes of large forests, much water power, and of magnesite (Radenthin), lignite (Lavant Valley), lead and zinc (Bleiberg), and iron and manganese ores (Hüttenberg). First rank the sawmill, paper, pulp, cellulose, fiber-board, and furniture industries which are widely distributed. They are followed by the production of chemicals, chiefly in the Klagenfurt Basin, leather and leather-working (Klagenfurt), and other industries.

Salzburg\textsuperscript{27} is much visited by tourists and has a strategic location with reference to transportation routes. The comparatively small industry is concentrated in the Salzach valley, most of all in and around the city of Salzburg. It is based on timber, hydro-electric energy, salt (Hallein), copper (Mitterberg), and other minerals. Most branches of industry are represented.

Tyrol\textsuperscript{28} lies at the junction of the main Austrian road from east to west and the Brenne route between Germany and Italy, and is the first Pro-

\textsuperscript{24} The number of industrial operative amounts to 17\% (110,000) and the value of industrial output to 22\% of the total for Austria.
\textsuperscript{25} Forests cover almost half of the area of Styria. The Province produces 89\% of the iron ore, 60\% of the lignite and magnesite, and about one ninth of the electrical energy of the country.
\textsuperscript{26} Kärntner Heimatatlas; ed. by V. Paschinger, since 1952.
\textsuperscript{28} The number of industrial operatives was 25,000 and the gross value of industrial output 3.7 bill. A. sh. in 1957.
province as regards tourist traffic. Most factories are located in the Lower Inn Valley. They use the abundant hydro-electric energy and a few minerals. The industry is largely working for the exports. It produces powder, heavy, and vacuum-melted metals (Reutte), Diesel motors and locomotives (Jenbach), glass, including optical glass and costume jewelry, penicillin, cement, textiles, and lumber.

Vorarlberg, the westernmost Province of Austria, is also important in tourist trade and output of hydraulic energy, but more industrialized and under the influence of Switzerland. Outstanding is the textile industry, concentrated mainly in the Rhine Plain. It employs about three quarters of all industrial operatives of Vorarlberg and one quarter of all textile workers of Austria, possesses most modern equipment, produces staple-fiber and cotton textiles and embroidery of highest quality, and is strongly oriented to export business. Other industries manufacture food, clothing, and chemicals.

In this way each Austrian Province shows an individual industrial structure which corresponds to its position and rank, general geographical pattern, specific industrial location factors, and the stage of economic development.

【短報】オーストリアの工業化と産業構造

レオポルド シャイドル

本論文はオーストリア連邦共和国の概観、天然資源（農林・地下資源・水力）、交通、貿易、市場の立地条件の記述に始まり、工業生産の分布についてまとめ、ついでオーストリア各州の工業構成を分析したものである。この中で興味ある事実は29)，オーストリアがルーマニア、ドイツについて石油産出国であり、天然ガス（石油性）の輸出も非常に増加していること、鉄鉱石、マンガンの産出額が全体の4分の3を占めていること、水力電気も豊富で、生産力の10%を占めるほど豊富であることがある。労働力も十分あり、産業開発が主として西部において行われたために、労働力が東から西へと移動をみている。鉄鋼、アルミ、化学工業は戦前から発達していたが、戦後に復興と設備の更新が行われると主に、主要産業の国有化が行われた。リンツにあるVÖEST、製鉄所と、レーベン・ドナウツ（上スティリア）のÖAMG 製鉄所を合せた鉄鉱(184万トン)、粗鋼(232万トン)、ロール製造(172万トン)（以上1959年統計）は、オーストリアを含むヨーロッパ地域での有力な産業国としている。アルミ製造に関してもヨーロッパで最大の工場の一つを持っている。またオーストリアのレンツェンク・スフ会社は、同種のものではヨーロッパ最大の工場を、スフ生産(5.23万トン)の60%を輸出している。

30) 本会々員・ウィーン貿易大学教授 Prof. of Econ. Geogr., Hochschule für Welt Handel.
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31) 抄録は木内貢集委員が行った。原著者の重点の書き方に若干異っていることを了承されたい。