breed of sheep has been greatly improved. The woods and moun­tains harbour large quantities of game, such as red deer, roedeer, wild boars, and hares, while an occasional wolf finds its way into the province from the Carpathians. The fishery includes salmon in the Oder, trout in the mountain-streams, and carp in the small lakes or ponds with which the province is sprinkled. Compare the tables in Prussia (vol. xx. p. 14).

The great wealth of Silesia, however, lies underground, in the shape of large stores of coal and other minerals, and its mining records go back to the 12th century. The coal-measures of Upper Silesia, in the south-east part of the province, are among the most extensive in continental Europe, and there is another large field near Waldenburg. The annual output, ranging between twelve and fifteen millions of tons, valued at nearly £3,000,000 sterling, is equal to more than a quarter of the entire yield of Germany. The district of Oppeln also contains a great quantity of iron (annual produce 750,000 to 800,000 tons, value about £1,000,000). The deposits of zinc in the vicinity of Beuthen are perhaps the richest in the world, and produce four-fifths of the zinc of Germany (550,000 tons). The remaining mineral products include lead (from which a considerable quantity of silver is extracted), copper, cobalt, arsenic, the rare metal cadmium, alum, brown coal, marble, and a few of the commoner precious stones (jaspers, agates, ame­thysts, &c.). The province contains practically no salt or brine springs, but there are well-known mineral springs at Warmbrunn, Salzbrunn, and several other places.

A busy manufacturing activity has long been united with the underground industries of Silesia, and the province in this respect yields the palm to no other part of Prussia except districts in the Rhineland and Westphalia. On the plateau of Tarnowitz the working and smelting of metals is naturally the predominant industry, and in the neighbourhood of Beuthen, Königshütte, and Gleiwitz there seems an almost endless succession of iron-works, zinc-foundries, machine-shops, and the like. In 1881 the total value of the metals produced in the various foundries of the pro­vince was £2,376,250. At the foot of the Riesengebirge, and along the southern mountain line generally, the textile industries pre­vail. Weaving has been practised in Silesia, on a large scale, since the 14th century; and Silesian linen still maintains its reputation, though the conditions of production have greatly changed. Cotton and woollen goods of all kinds are also made in large quantities, and among the other industrial products are beetroot sugar (157,000 tons in 1883-84), spirits, chemicals, tobacco, starch, paper, pottery, and “Bohemian glass.” Lace, somewhat resembling that of Brussels, is made by the women of the mountainous districts. The trade of Silesia is scarcely so extensive as might be expected from its important industrial activity. On the east it is hampered by the stringent regulations of the Russian frontier, and the great waterway of the Oder is sometimes too low in summer for naviga­tion. The extension of the railway system has, however, had its usual effect in fostering commerce, and the mineral and manufac­tured products of the province are freely exported.

At the census of 1880 the population of Silesia was 4,007,925, of whom 2,082,084 were Roman Catholics, 1,867,489 Protestants, and 52,682 Jews. About 35 per cent. of the population is urban and 65 per cent. rural. The density is 257 per square mile, less than that of Westphalia (262) and the Rhineland (390); but the average is of course very greatly exceeded in the industrial districts, such as Beuthen. The occupation census of 1883 shows that 44 per cent. of the population are supported by agriculture, 36 per cent. by industries, 8∙4 per cent. by trade, and 2∙2 per cent. by daily labour and domestic service, while 4 per cent. belong to the official and 5 per cent. to the unemployed classes. Nearly three-fourths of the inhabitants and territory are German, but to the east of the Oder the Poles (nearly 1,000,000) form the bulk of the population, while there are about 50,000 Czechs in the south part of the province and 30,000 Wends near Liegnitz. The Roman Catholics, most of whom are under the ecclesiastical sway of the prince-bishop of Breslau, are predominant in Upper Silesia and Glatz; the Protestants prevail in Lower Silesia, to the west of the Oder, and in Lusatia. The noblesse is very numerous in Silesia, chiefly in consequence of the Polish districts it includes. The educational institutions of the province are headed by the univer­sity of Breslau. In 1883-84 the percentage of illiterate recruits, in spite of the large Polish-speaking contingent, was only 1∙70. The capital and seat of the provincial diet is Breslau, which is also by far the largest and most important town (298,893 inhabitants in 1885). The towns next in point of size are Görlitz (55,120 inhabitants), Liegnitz (43,351), Königshütte (31,831), Beuthen (26,478), Schweidnitz (23,775), Neisse (21,444), and Glogau (20,003). The province sends thirty-five members to the reichstag and sixty-five to the Prussian chamber of deputies. The government divisions of Breslau and Oppeln together form the district of the 6th army corps (seat, Breslau), while Liegnitz belongs to that of the 5th army corps, the headquarters of which are at Posen. Glogau, Glatz, Neisse, and Cosel are fortresses.

Austrian Silesia, the part of the duchy that remained to

Austria after the Seven Years’ War, is a mere fraction of the whole, its area being only 1980 square miles, or about one-eighth of that of Prussian Silesia. It falls into two small portions of territory, separated by a projecting limb of Moravia and sur­rounded by Prussian Silesia, Moravia, Hungary, and Galicia. Until 1849 it was for administrative purposes reckoned a part of Moravia, but since that year it has been a crownland of the Austrian empire (the smallest of all), with the style of duchy. The Troppau or western division of the crownland is flanked by the Sudetic Mountains (Altvater, 4678 feet), and the Teschen or eastern half by the Carpathians (Lissahorn, 4330 feet), and a great proportion of the surface is occupied by offshoots of these ranges. The Vistula rises on the Carpathians, within Austrian Silesia, while the western part of the crownland is close to the headwaters of the Oder, which rises near at hand in Moravia. Owing to its mountainous character and its slope towards the north and north­east the crownland has a somewhat severe climate for its latitude, the mean temperature being only 50° Fahr., while the annual rainfall varies from 20 to 30 inches. Upwards of 45 per cent. of the surface is occupied by arable land, 71/2 per cent. by meadows and gardens, 101/2 per cent. by pastures, and 32 per cent. by forests, while 41/2 per cent. is unproductive ground. The soil cannot as a rule be termed rich, though some of the valleys are fertile. The chief crops are oats, rye, barley, potatoes, clover, and flax. Dairy­farming is carried on in the mountains after the Alpine fashion, and sheep are fairly numerous. Geese and pigeons are reared in great quantities, and the hunting and fishing are both very prolific. The principal mineral resources are coal (Silesia producing 13 per cent. of the produce of Austria-Hungary), iron, marble, and slate. Like its Prussian neighbour, the crownland boasts a very busy industrial activity, the chief products of which are its iron and steel goods, textile fabrics (linen, woollen, cotton, velvet, silk), chemicals, liqueurs, and beetroot sugar. The trade is chiefly a transit one, though the manufactures and agricultural produce of the province are exported in considerable quantity. Troppau, the capital of the duchy, contains large cloth manufactories, while Teschen, Bielitz, and Jägerndorf are also busy places. The population in 1885 was 577,593, of whom 81,000 were Protestants and 9000 Jews. About 48 per cent. of the population is supported by agriculture and 27∙5 per cent. by industry. Divided according to nationalities, there are 275,000 Germans, 130,000 Czechs, and 158,000 Poles. The German element is predominant in the towns, the Polish in the eastern or Teschen division. The duchy sends ten members to the Austrian house of representatives and has a provincial diet of thirty-one members. (J. F. M.)

SILICA, the only known oxide of silicon (see Chemistry, vol. v. pp. 521-524), occurs native in a great variety of forms, which, however, correspond to only the four distinct species of Quartz (*q.v*.; see also Miner­alogy, vol. xvi. p. 389), tridymite, Opal (*q.v*., and compare vol. xvi. p. 390), and siliceous earth. Ordinary quartz- rock and sand are more impure forms of quartz. Tridymite differs from quartz only by a lower specific gravity, and in crystallometric details; the crystals are as a rule arranged in triplets—hence the name (see vol. xvi. p. 389). Sili ceous earth when dry forms a very voluminous, soft, fine powder; it consists of the shells of *Infusoria.* As a chemical species it differs little from opal. Siliceous earth, having a very low rate of thermal conductivity, serves well as a stuffing for the hollow walls of ice-chests, fire-proof safes, &c. It is used besides for the making of Dynamite (*q.v.*)*.* Silica of any kind is absolutely non­volatile, and is fusible only at the temperature of the oxy- hydrogen flame; a slight admixture of base (potash, lime, &c.), however, suffices to cause it to “*frit*” at a red heat. It is absolutely proof against the action of water and ordinary mineral acids; hydrofluoric acid acts on it ener­getically, as explained in Chemistry, vol. v. p. 522.

*Alkaline Silicates.—*Silica readily dissolves at a red heat in fused alkaline carbonates, with evolution of carbonic acid and formation of alkaline silicates. In this process one molecule SiO2 of silica is capable of decomposing at most 2R2OCO2 (where R=K or Na). The compound SiO2.2R2O, “orthosilicate” of alkali, freezes into a compact non-transparent mass, readily soluble in water, with formation of an intensely alkaline solution. It does not unite with any additional alkali, but readily fuses up with more silica. Without going beyond a red heat it is easy to produce thus homogeneous masses of *any* composition, Na2O.*x*SiO2 from *x*=1/2 up to *x*=(at least) 4.

Compounds approximating to *x* = 4 are known as *water glass.* Potash water glass, K2O.4SiO2, was discovered in 1825 by Fuchs in