



## COAL

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**COAL** (*zoḡāl-e sang*), carbonized organic material used as a solid fuel. Although Persia and Afghanistan are rich in coal deposits (Harrison, pp. 492-96; Research Group, pp. 58-149; Arens, pp. 126-28), these deposits have only recently come to be exploited. In Transoxania coal was used for fuel as early as the 10th century, however. Eṣṭakrī (p. 334; and following him Ebn Ḥawqal, II, p. 515; tr. Kramers, II, p. 492) mentioned a mountain in Asbara, a region of Farḡāna, that was “of black stone, which burns like charcoal (*faḥm*)”; the ashes were used for bleaching clothes. Three loads (*awqār*, sing. *weqr*) of coal cost one dirham (cf. Barthold, *Turkestan*<sup>3</sup>, p. 161). Wilhelm Barthold (*Turkestan*<sup>3</sup>, p. 236) ascribed the early development of metal manufacture in Farḡāna to the presence of coal mines.

*Development of coal mining in Persia.* It was not until the mid-19th century that coal mines attracted serious attention. At that time Europeans began to investigate the mineral potential of Persia; the most important were mentioned by G. N. Curzon (*Persian Question* II, p. 516 n. 1). Some Europeans believed that coal was to be found throughout the country (Blau, p. 94; Polak, II, p. 178), whereas others described only specific sites of which they were aware, most in or near Azarbaijan, Zanjān, Māzandarān, Gilān, Kāšān, and Kermān (Abbott, pp. 4, 227; Schlimmer, p. 125; Floyer, p. 316).

Despite these rich resources, however, coal was not much used in Persia. It could, for example, be found 6 km from Tabrīz, “but it has not attracted the attention of the Government or people” (Abbott, p. 224). There were several reasons for this lack of interest. Although coal often lay on the surface, there



were few roads suitable for transporting it and almost no industry that might have engendered demand for it. Ordinary Persians claimed that, as they could not burn it in their water pipes, they had no need of it (Polak, II, p. 178). Only Europeans living in Tehran and Tabriz used coal for heating; they collected it from the surface in baskets (Blau, p. 94). Near Astarābād in Gorgān there were seams that were not regularly worked, “but the coal taken from the surface was formerly supplied to the Russian squadron. One horse load, or about 200 lbs, costing at Ghez [Bandar-e Gaz] five sahib keran [*ṣāḥeb-qerān*] (5 s.). Coal at Astracan is said to cost the Russians five times as much” (Abbott, p. 23). All these observers agreed, however, that coal would soon become important to Persia. Keith Abbott, appointed British consul in Tehran in 1253/1837, emphasized the coal of Azarbaijan, “which hitherto has been little attended to, but which a more direct communication with Europe will some day bring into notice” (p. 223). Persians did in fact begin using coal on a small scale in the 1850s. That found in the vicinity of Ask (Lārījān district, Māzandarān) was used by the smiths in some villages (Abbott, p. 4). Coal was sporadically mined at Hīv, 90 km from Tehran, in the 1860s, and another mine nearby, at Ābyak on the road to Māzandarān, produced coal for the smiths in Tehran; there was a third mine at Fašand (Schlimmer, p. 125; Curzon, *Persian Question* II, p. 516). S. G. W. Benjamin (p. 45) mentioned that gypsies used coal in their camps. According to J. E. Polak (II, p. 54), in about 1860 coal was slightly more expensive in Tehran than in Vienna.

Coal production received a boost from efforts to introduce modern industry into Persia; some of the new factories, including the first gasworks (*kār-kāna-ye čerāḡ-e gāz*) established in Tehran, in 1298/1881, and the first power plants in the city, were fueled by coal, which nevertheless remained a minor source of energy for electrical production (see [barq](#)). In 1305-06/1888 the output of the Ābyak and Hīv mines was 2,000 and 9,000 tons respectively. The mine at Fašand had been leased by a small syndicate of foreigners, La Société de Charbonnage, led by Fabius Boital, who also obtained a concession to construct a railway from the pithead to Tehran (the work was never done). In the spring of 1307/1890 the Persian Bank Mining Rights Corporation was formed to acquire and work the mines, including the mining rights of the Imperial Bank of Persia. This enterprise did not succeed, however, and was finally abandoned in 1310/1892. In 1307-08/1890 annual coal consumption at Tehran was about 15,000 tons. At the pithead coal cost 4-7 *qerāns* a *karvār* (649 pounds; 294.4 kg), or 14-24 *qerāns* a ton. Most of it was transported to the city on donkeys, mules, or camels at a cost of 30-32 *qerāns* a ton; an octroi of 2



*qerāns* a ton was paid at the city gate. The coal was then sold in the *bāzārs* at an average price of 70 *qerāns*, or 21 shillings, a ton (Curzon, *Persian Question* II, pp. 513, 516, 526).

There was no genuine national market for coal, demand being limited to specific areas. Nevertheless, Persia had to import coal because the domestic transport system was inadequate for shipping on a large scale. Steamships brought it from Great Britain to the Persian Gulf; in 1889-90 coal from Cardiff sold at Būšehr for 33-53 shillings a ton, the average price being 2 pounds sterling. Lord Curzon therefore welcomed the rumor that good coal had been found in the Daštī district in Fārs. Although local markets for coal did gradually develop, many Persians still had no need for it. At Qom they objected “to the use of coal in their sacred city, on the ground that it pollutes the air round the shrine of the holy Fatima” (*Persian Question*, II, p. 519).

*Coal in modern Persia.* The coal mines near Tehran in particular continued to be worked by a primitive system of digging shallow surface pits, though only during the summer, in order to supply the winter needs of Tehran and the nearest towns and villages; they still yielded approximately 2,000 tons of coal a year at the beginning of the Pahlavi period (1304-57 Š./1925-79; Hadow, 1925, p. 38). “The remainder of the population’s needs is met by bringing charcoal over the mountains from Māzandarān, Gilān and elsewhere and as the lack of proper roads make it necessary to transport all supplies of both these articles by mule the cost of transport is all out of proportion to the initial cost of production. As a result coal costs on an average 7 [pounds sterling] a ton, charcoal 11 [pounds sterling] a ton, and wood in limited quantities from local supplies, 3 [pounds sterling] 10s. a ton in Tehran” (Hadow, 1923, pp. 7-8). In the mid-1920s seventeen coal mines were in operation, some of them employing more than 200 workers each. Pit coal was sold in ten privately owned shops employing a total of twelve *kārgars* (laborers) in Tehran in 1308 Š./1929 (*Second Yearbook*, pp. 80-81; see [Table 53](#)). Melvin Hall reported that in Tehran in 1922 “there was coal available for the hearths or stoves of the well-to-do, shaley stuff brought down on donkey-back from high in the Tokjal [Towčāl] range at a price of around thirty-six dollars a ton” (p. 192). In the 1930s mining machinery was imported, permitting greater exploitation of coal mines, especially near Tehran, Mašhad, and Isfahan, and providing an alternative to wood fuel, which was becoming more expensive (Bharier, p. 224). The coal was generally of poor quality, however. The principal mines were at Šemšāk and Zīrāb, north of Tehran. Exploitation of coalfields near



Isfahan and at Torbat-e Jām in Khorasan began in 1315 Š./1936; they supplied fuel for cotton mills and a paper factory in Isfahan and the sugar refinery at Mašhad. Coal was also produced in Azarbaijan, where industrial expansion at Tabrīz, combined with the rising cost of firewood, guaranteed a market for it (Gray, p. 24). By 1318 Š./1939 coal was also being used in five of approximately sixty power plants in Persia. Annual coal production rose to about 120,000 tons just before World War II, though the potential was much higher (*Persia*, p. 464; Bharier, p. 224). The Persian railways were partly fueled by coal, which was “produced locally, and since the arrival of W.D. [Winton-Diesel] locomotives has also been imported; adequate stocks are maintained at the chief stations” (*Persia*, p. 555). By the end of the war, however, most Persian mining equipment had become obsolete or was in need of repair; production of coal in 1326 Š./1947 was thus still at the prewar level (Bharier, p. 151). The most important mines at that time were at Šemšāk, Zīrāb, Delīlam, Gājara, and “Elika” near Tehran and Galandrūd near Bābolsar (Overseas Consultants, IV, pp. 174-77).

According to the 1345 Š./1966 census, kerosene had become the main heating fuel in Persia, accounting for 80 percent of the market. Wood and coal, burned mainly in rural households, accounted for most of the remainder; the coal came primarily from local mines (Bharier, p. 151). In Semnān province in 1349 Š./1970 “kerosene, with either wood or charcoal, was used by 80 percent of households as fuel for cooking and heating” (Connell, p. 82). In the same year about seventy surface and pit mines were being worked in northern Persia, each normally employing about twenty people, though the Zīārān mine was worked by 1,335 people (Research Group, pp. 107-16). Coal was sold either in lump form or as coke, converted in plants often fueled by firewood. The main consumers were brick kilns, sugar factories, textile factories, cement works, and other industrial plants; after 1350 Š./1971 the steel mill in Isfahan was a particularly important coal user. Briquettes of pressed coal dust and “Bahmanī” were also sold (Research Group, p. 116). In 1351-52 Š./1972-73 the total output from Persian coal mines was about 1 million tons, produced by 8,250 miners. Most of the mines were in Kermān and Khorasan, and a large proportion of the production was extracted and used by the Iran National Steel Mill Corporation. In 1355 Š./1976 coal deposits were estimated at 300 million tons, more than 75 percent in the Kermān region (*Iran Almanac*, 1973, p. 231, 1976, p. 200). In the first years of the Islamic Republic coal production increased slightly, to a level of 1.2 million tons in 1361 Š./1982 (*Iran Almanac*, 1987, p. 242).



*Coal in Afghanistan.* In Afghanistan coal deposits are also considerable and were already known in the 1880s, though the energy value of this coal is rather low (Arens, pp. 126-28). The main deposits are at Karkar, Ešpošta (Qondūz), Dara-ye Šūf (Balk), and Sabzak (Herat). As in Persia, however, the absence of demand and transportation facilities meant that little was mined. In fact, coal was still being imported in the 1930s. In the 1960s production soared, reaching an annual growth rate of 20 percent. The market for coal was limited, however, to a few industries, four of which accounted for 80 percent of consumption in the 1970s. Despite the fact that coal briquettes were subsidized and thus cheaper per megajoule, consumers preferred charcoal, firewood, or dung for heating their houses and cooking (for prices, cf. Arens, p. 216). Most were not accustomed to coal, which was also cumbersome to obtain (Arens, pp. 213-15, 264-65). Currently coal found north of the Hindu Kush is trucked to Kabul in summer before snow closes the Šibar pass. It is thus very expensive, particularly in the eastern and southern regions. Small local pits supply northern towns and villages with some coal (U.S. Government, p. 112). Coal production reached 160,000 tons in 1361 Š./1982, 130,000 tons from the Sabzak mine alone (Government of Afghanistan, p. 21; cf. Arens, pp. 181-82).

See also [charcoal](#).

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