



## ČĀH

---

ČĀH “well.” Together with the well-known *qanāt* (subterranean water canals), wells (*čāh*) play a great part in the mobilization of the groundwater resources of Persia (Issar, Kardavānī). Beside the traditional man-operated and animal-operated wells, the multiplication of motor-operated deep wells has recently brought important change in many regions.

Traditional wells are dug by professional well sinkers (*čāh-kan* or *čāh-kū*), whose work is similar to that of the *moqannī* digging the shafts of a *qanāt* (Wulff, p. 256): they set up a windlass (*čark-e čāh*) in order to haul out the spoil from the shaft, which they dig with a pick and a spade; the part near the top or the whole shaft in soft soils, is lined with logs or earthenware rings.

Most of these wells are hand-operated wells (*čāh-e dastī*) that are the usual means to supply domestic water needs in the alluvial plains, whereas the piedmont and mountain settlements secure their water either from springs or from *qanāts*. In the Caspian lowlands, where the water table is especially high, every house has got its own well in the yard, and the water is lifted with a bucket or a jar attached to a forked wooden pole called *gerde-kāle* (Bromberger, pp. 11, 27-32). In other regions, like southern Fārs, wells are deeper and water is hoisted up in a leather bucket, either with a rope running on a pulley or with a windlass (Wulff, p. 258). The water-lifting beam *šadūf*, widespread in Anatolia and Mesopotamia, is only in use in the plains of Kūzestān (Wulff, p. 259).

In many parts of central Persia, animal-operated wells supply water in greater



amounts to gardens or fields. Two pillars at the head of the well support a scaffold holding one or two pulleys; an animal, ox, mule or camel, guided by a water drawer (*āb-kaš*) along a runway sloping down from the well head, pulls up a large leather bag (*dalv-e ābkašī*) which is emptied in a basin by means of an auxiliary rope (Wulff, pp. 256-57).

In the 1960s, a great impulse was given to the sinking of power-operated deep and semideep wells. Semideep wells (*čāh-e nīma-‘amīq*, 15 to 30 m deep) can still be dug with the traditional techniques but are lined with concrete and equipped with a motor above the well or in a side room some meters under the ground (see technical details in Flower, pp. 606-07, and Mahdavī, pp. 28-29). Deep wells (*čāh-e ‘amīq*, up to 150 meters deep) are always drilled and tubed (a good example is given by Mahdavī, pp. 35-36). Pumping is usually performed by diesel motors and quite seldom by an electric motor (one case near Mašhad given by Flower, p. 607).

Most of these wells have been sunk in piedmonts and basins of interior Persia, where they have partly completed and partly replaced the traditional *qanāts*. Thus every irrigated area is now characterized by a changing equilibrium between *qanāts* and wells (regional examples in Flower, Bazin, Mahdavī). On the national scale, the 12,945 deep wells operating in Persia in 1973 supplied 32.7% of the ground water used in the whole country, against 35.2% given by some 15,500 *qanāts*, 18.4% by 32,719 traditional wells and 13.7% by 3,640 natural springs (Ehlers, 1980a, p. 94). But the too fast development of deep wells resulted in the exhaustion of many *qanāts* and in a general lowering of the watertable level, observed for instance in the plains of Qazvīn, Varāmīn, and Garmsār at the foot of the Alborz, in the Asadābād basin west of Hamadān in the Zagros, and in central Persian oases like Bam, Ṭabas, and Jīroft (Ehlers, 1980a, pp. 92-93). But if this last group could be described as “the dying oases of Central Iran” (Ehlers, 1980b), it is also for socioeconomic reasons, such as the effects of land reform.

In fact the drilling of deep and semideep wells required considerable capital expenditure, and so it generally remained in the hands of important landowners (Bazin, p. 37; Ehlers, 1980b, p. 69). In some cases owners of *deymī* (unirrigated) land have leased it to a third person who would sink a well, for instance in Fārs (Lambton, p. 275) or in Khorasan (Nadjmabadi, pp. 60-61): in Dašt-e Karāt, close to the Afghan border, 21 wells were established in 1962-74, of which 9 were in the hands of a well-to-do Sayyed family; the owners (called *arbāb* like the landlords) were represented on the spot by a bailiff (*šāḥeb[-e]*



*kār*) and appointed men called *sālār* to direct the teams of sharecroppers (*dehqān*) working on every plot of newly irrigated land. Yet some wells were sunk as well by groups of peasants to whom land property had been transferred after land reform or by cooperative societies (various examples in Lambton, pp. 282-83). How far the socioeconomic status of land irrigated by deep wells has changed since the Revolution of 1357 Š./1978-79 is not clearly known yet.

See also [qanāt](#).

## BIBLIOGRAPHY

---

M. Bazin, *La vie rurale dans la région de Qom*, Paris, 1974.

C. Bromberger, *Habitat, architecture et société rurale dans la plaine du Gilân (Iran septentrional)*, UNESCO, Établissements humains et environnement socio-culturel, no. 36, n.p., n.d. (1985).

E. Ehlers, *Iran. Grundzüge einer geographischen Landeskunde*, Darmstadt, 1980a.

Idem, "The Dying Oases of Central Iran. A Few Remarks on Causes and Consequences," in W. Meckelein, ed., *Desertification in Extremely Arid Environments*, Stuttgarter Geographische Studien 95, Stuttgart, 1980b, pp. 65-71.

D. J. Flower, "Water Use in North-East Iran," in *Camb. Hist. Iran I*, 1968, pp. 599-610.

A. Issar, "The Groundwater Provinces of Iran," *Bulletin of the International Association of Scientific Hydrology* 14/1, March, 1969, pp. 87-99.

P. Kardavānī, *Manābe' wa masā'el-e āb dar Īrān: ābhā-ye saṭḥī wa zīr-zamīnī wa masā'el-e bahra-bardārī az ānhā I*, Tehran, 1363 Š./1984-85.



A. K. S. Lambton, *The Persian Land Reform 1962-66*, Oxford, 1969.

M. Mahdavi, *Pažūheš-ī dar bāra-ye āb wa ābyārī dar rūstāhā-ye maṅṭaqa-ye biābānī-e šarq-e Kāšān*, Tehran, 2536 = 1356 Š./1978.

S. Nadjmabadi, “Die sozio-ökonomischen Folgen der Anlage von Tiefbrunnen am Beispiel von Dašt-e Karāt (Ḥorāsān),” in G. Schweizer, ed., *Interdisziplinäre Iran-Forschung. Beiträge aus Kulturgeographie, Ethnologie, Soziologie und neuerer Geschichte*, Wiesbaden, Beihefte zum Tübinger Atlas des Vorderen Orients, Reihe B, no. 40, 1979, pp. 59-70.

H. E. Wulff, *The Traditional Crafts of Persia*, Cambridge, Mass., and London, 1966.