Published: December 15, 1990
Last Updated: December 13, 2017

CENTRAL ASIA I. GEOGRAPHICAL SURVEY

CENTRAL ASIA

i. Geographical Survey

The central expanse of the Asian continent, the land mass situated approximately between 55° and 115° E and 25° and 50° N, comprises two geographically distinct areas. The western part includes the Transcaspian plains and the low tablelands between the Aral Sea and the Tien Shan (lit. “heavenly mountains”) range; it is generally equivalent to the territory of western Turkistan (the Turkmen, Uzbek, and Tajik Soviet Socialist Republics and the southern and western portions of the Kazakh Soviet Socialist Republic). The eastern part encompasses the high plateaus and mountainous perimeters of the Tarim basin (approximately equivalent to Eastern Turkistan, now Sinkiang [Xin-jiang] Uighur province of the People’s Republic of China) and Tibet, the area north of the Tien Shan mountains as far as the southern Siberian plains and the Altai mountains (the northern and eastern portions of the Kazakh S.S.R.), and the Gobi desert (comprising parts of the Mongolian People’s Republic and Chinese Inner Mongolia), along with the high mountain ridges thrusting east and south into China and Southeast Asia.

Although the imprecise term Central Asia has been used to designate various regions within this vast area, most Western scholars apply it to western

Turkistan, designating the area between 70° and 100° E and 25° and 45° N as Inner or Innermost Asia (Haute Asie, Inner-Asien, Tsentral'naya Aziya; See chinese turkistan).

Land forms. The Eurasian continental plate over-thrusts the Indian subcontinent, and Central Asia thus belongs to an earthquake zone that extends through the Caucasus and Anatolia and across the Mediterranean and the Atlantic to the Caribbean islands; particularly along the ridges of the Alai range, the Hindu Kush, and the mountains bordering Persia earthquakes are common, though not accompanied by volcanic activity. The landscape of western Turkistan is characterized by mountain ranges separated by high plateaus, an extreme continental climate, severe aridity, and resulting scarcity of vegetation and animal life.

The crest lines of the great Central Asia mountain systems generally lie on east-west axes, which seem to radiate from the Pamirs. A cluster of parallel ranges curving to the southwest, then to the west, are generally known as the Hindu Kush, the Paropamisos of the Greek geographers (cf. Pauly-Wissowa, XVIII/4, cols. 1778-79). The southernmost of these ranges bends sharply westward, then south, continuing as the Sulaiman mountains, which separate the Iranian plateau from the lowlands of the Indus (Sindh), though, as there are few elevations higher than 2,000 m, they do not constitute a major geographical barrier. The range extends in various chains south and west through Baluchistan, thus linking the Pamirs with the Zagros system along the southern and southwestern margins of the plateau. The main ranges of the Hindu Kush, however, extend directly southwest, gradually declining in elevation to an average of around 4,000 m; they are linked to the volcanic Transcaucasian plateau by the Bīnālūd, Alborz, and Qarā Dāḡ chains, which form the northern boundary of the Iranian plateau, 1,000 m lower on the average than the Zagros. The highest peaks of the Hindu Kush include Tirich Mir at 7,750 m in Pakistan on the Afghan border and a number exceeding 6,000 m in northeastern Afghanistan; those in the western portion of the range and in the Bīnālūd rarely exceed 3,000 m. In Tajikistan the Alai range extends straight west from the Pamirs, with a fairly even crest line; it is paralleled just to the south by the Trans Alai and still farther south by the Darvaz (Qarā Tegīn) range, which, however, traces an arc similar to that of the Hindu Kush, trailing off to the southwest in several minor subranges. The highest peaks in this region are Pik Kommunizma (Communism, formerly Garmo, peak, 7,495 m) in the Darvaz chain and Pik Lenina (Lenin peak, 7,127 m) in the Trans Alai.

In the western Alai, 110 km southeast of Samarkand, Pik Chimtarga rises to 5,490 m, west of which the range trails off in a southwestern branch and a shorter western one.

The steppes on the northern and western flanks of the great mountain ranges extending east from the Caspian Sea, respectively the Kopet-Dag/Bīnālūd mountains, the Alai, the Hindu Kush, and the Tien Shan, are at elevations of 100-500 m. South of these ranges the Iranian plateau, which extends into Afghanistan, lies between 1,000 and 1,500 m. The uplands of the Pamirs are at elevations of 3,000-4,500 m. In all three zones the land generally tilts from south to north. The soil from central northern China to the Atlantic Ocean at every altitude, even beneath the sand of the deserts, is mostly yellow loess and very fertile when there is enough water.

Water. Because of increased precipitation at higher elevations, which may reach a maximum of 1,000 mm a year, the snow cover and particularly mountain glaciers are the main sources of water for Central Asia. In the Pamirs the snow line lies as high as 5,500 m. In the latitudinal ranges it is often 500-700 m lower on the northern slopes than on the sunny southern slopes. The glaciers, most of them valley glaciers, are associated with the highest peaks. In Soviet Central Asia alone 1,700 glaciers total 11,000 km^2, five times the surface of the Caucasian glaciers; they also melt at a much more rapid rate than those in the Caucasus or in Switzerland. The largest is the Fedchenko glacier, discovered in the early 20th century near Communism peak north of the Yazgulem pass; it is 77 km long, 2-5 km wide, and 550 m thick, with a volume exceeding 200 km^3. From an altitude of 5,330 m it extends down to 2,904 m and is fed by thirty-seven tributary glaciers, some of them more than 10 km long. The Fedchenko glacier melts at a rate of 27 cm a day, 100 m a year; in 1924-35 it lost a total of 282 m. Also in the northwestern Pamirs are the Garmo (29 km long), Fortambek (25 km), and Finsterwalder (16 km) glaciers. In the Alai range the Zeravshan glacier, 25 km long and 200 m thick, is located in the valley between the Turkistan and Zeravshan chains. It melts at a rate of 27 cm a day and is the source of the Zeravshan river. Glacial melting at high altitudes is responsible for the summer flow maximum of Central Asia rivers. A spring maximal flow occurs when these rivers are fed by the melting snow on the lower slopes of the mountains bordering the fertile loessial piedmont plains on which most of the irrigated agriculture of Central Asia is concentrated.

The major rivers in western Central Asia are the Syr Darya (Jaxartes) and Amu

Darya (Oxus; see āmū daryā) rivers. The Syr Darya, almost 1,400 km long begins as a small stream in the Farḡāna mountains and is fed by the Naryn, which rises farther east on the southern slopes of the Terskey Ala Tau, south of Lake Issyk Kul, and flows west through the Farḡāna valley. At Leninabad, the western gateway to the Farḡāna valley, it turns sharply northward, bypasses the oasis of Tashkent, and flows northwest, emptying into the northeastern tip of the Aral Sea (in 1987 40 m above sea level). Important towns in the Syr Darya basin include Chimkent and Turkistan in southern Kazakhstan and Kazalinsk in the delta. Farther south the much longer Amu Darya (ca. 2,500 km) drains the Pamirs and the northern Hindu Kush. Its upper course, which defines the border between Afghanistan and Tajikistan, is called Pyandzh as far as the confluence with the Vaḵš west of Kirovabad; the Vaḵš rises in the Alai as the Kyzyl Su (Pers. Sorḵāb, lit. “red water”) and follows the Darvaz range south. Dushanbe, the capital of Tajikistan is situated 1,220 m above sea level on the Kafirnigan river, which joins the Amu Darya west of the confluence with the Vaḵš. From there the Amu Darya flows generally northwest and empties into the Aral Sea from the south; along its lower course, in ancient Choresmia (q.v.), the important towns of Khiva (Ḵīva) and Urgench (Ūrganj) are located. Both the Syr Darya and Amu Darya have fed the irrigation systems of the fertile Central Asian plains since antiquity; furthermore, as they flow through these unforested expanses they lose a considerable volume of water through evaporation. These natural loesses, however, are modest compared to the diversion of nearly all the water of these rivers to irrigated agriculture in the Soviet era. One result of this is that virtually no water from either the Syr Darya or Amu Darya flows into the Aral Sea, which is shrinking at a rapid rate. From 1960 to 1987 it lost two-fifths of its area and two-thirds of its water volume.

Between the two great rivers the Zeravshan (Zarafšān) rises at the western end of the Alai range and flows west, watering the entire cultivated zone between Samarkand and Bukhara, before disappearing in the desert sands. The main population centers in Uzbekistan, aside from Tashkent, lie along its course, including Ziyauddin (Żīāʾ-al-Dīn), Meymana, Karmina, and Bukhara. South of the Amu Darya two former tributaries, the Morḡāb and Harīrūd (Tedzhen) rivers, drain the western Hindu Kush but also dry up in the sands of the Kara Kum (“black sand”) desert in Turkistan. The impressive ruins of ancient Marv are situated not far from where the Morḡāb disappears. Still farther south the Atrak rises between two ranges of the Bīnālūd mountains northwest of the town of Qūčān and flows west across the barren steppes east

of the Caspian, forming part of the border between Persia and the Turkman S.S.R.; it empties into Gasan-Kuli bay near Chikishlyar. Stormy Lake Karakul (elev. 3,780 m) in the northeastern Pamirs, southeast of Lenin Peak, is the source for a number of streams that water the high plateaus in that region, a land of rural valley settlements of essentially uniform size.

Climate. An extreme continental climate, with hot summers, cold winters, and sharp differences in temperature between day and night, characterizes the whole of Central Asia. At Kazalinsk near the mouth of the Syr Darya the mean temperatures in July and January are respectively 26° C and – 11.8° C (slightly higher than the – 15.1° C in Arkhangelsk, at 64.5° N); almost directly south, at Turtkul on the lower Amu Darya 28° C and – 5.1° C; and at Termez on the Soviet-Afghan border 31.5° C and 1.7° C. The winter lows preclude growth of most temperate-zone vegetation. Temperatures also rise and fall with extreme rapidity.

Because of the distance from the oceans, there are few clouds and little atmospheric moisture or precipitation, and solar irradiation is correspondingly strong. Much of the land surface is thus arid; the lowlands are preponderantly steppes, interspersed with stretches of sandy desert, particularly the Kara Kum on the Transcaspian plains (Turkmen SSR) and the Kyzyl Kum east of the Amu Darya. Wherever the natural water supply and precipitation are sufficient, the steppes and the fertile plateaus of the lowest zone are covered with grass. South of 45° N, the steppes begin to dry out by early July and have usually remained barren until late October or November, when some rain-bearing cloud formations move in from the Atlantic zone in the northwest. Over the last fifty years, however, there have been noticeable climatic changes, and it is now not unusual for compact cloud formations or overcast skies to appear in midsummer in some areas of western Turkestan as far south as the central course of the Syr Darya and the oasis of Tashkent. This change represents an extension of the influence of the northwestern maritime climate that formerly never penetrated beyond Moscow and central Russia in summer. Only rarely do monsoon clouds diverted from the regular southwest-northeastern path of the South Asian monsoons reach Central Asia. In Soviet Turkmenistan and western Uzbekistan the severe aridity of the Central Asian climate has also been mitigated to some extent by large-scale irrigation and the construction of dams (e.g., the Kara Kum canal). Evaporation from these projects contributes a certain amount of atmospheric moisture and has led to a more humid climate throughout the westernmost portions of Central Asia.

Historical climatology shows that current arid conditions result from a recent period of desiccation lasting 1,500-2,000 years, which particularly affected northern Africa and Arabia but also to a lesser degree the Asiatic continent.

BIBLIOGRAPHY

B. P. Alisov, *Klimat SSSR*, Moscow, 1969.

V. Chupakin, *Fizicheskaya geografia Tyan' Shanya*, Alma-Ata, 1964.

Fizikogeograficheskiĭ atlas mira, Moscow, 1964.

N. Gvozdetskiĭ, *Fizicheskaya geografiya SSSR. Aziatskaya chast'*, Moscow, 1970.

P. Lydolph, *Climates of the Soviet Union*, Amsterdam, 1976.

P. Micklin, "Desiccation of the Aral Sea: A Water Management Disaster in the USSR," *Science* 241/4870, September, 1988, pp. 1170-76.

E. Murzaev, ed., *Srednyaya Aziya*, Moscow, 1968.

M. P. Petrov, *Pustyni Tsentral'noĭ Azii*, 2 vols., Moscow, 1966.

A. A. Rafikov, "Ratsional'noe izpol'zovanie i okhrana vodnykh resursov Uzbekistana," *Geografia i prirodnye resursy* 4, 1986, pp. 44-47.

S. P. Suslov, *Fizicheskaya geografia SSSR. Zapadnaya Sibir', Vostochnaya Sibir', Dal'niĭ Vostok, Srednyaya Aziya*, 2nd ed., Moscow, 1956.