CASPIAN SEA i. GEOGRAPHY

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CASPIAN SEA, actually a lake, the largest in the world (estimated surface area in 1986: 378,400 km², volume 78,600 km³; approx. between lat 37° and 47° N, long 46° and 54° E); it is bounded on the south by Persia.

i. Geography

Physical geography.

I. Morphology and hydrology.

The Caspian “sea” consists of three distinct basins, each characterized by different features. The northern basin (91,942 km^2) is actually a shallow expanse of water, which never reaches a depth of more than 25 m and is less than 5 m deep over two-thirds of its area. It accounts for nearly a quarter of the total surface area of the lake but only 0.5 percent of the volume. The central and southern basins are deep depressions. The central basin, with a surface area of 137,812 km^2, a maximum depth of 788 m, and an average depth of 192 m, contains 33.9 percent of the total volume of water; the southern basin, with a surface area of 148,646 km^2, a maximum depth of 1,025 m and an average depth of 345 m, contains 65.6 percent of the volume.

These differences are reflected in the levels of salinity. Because it is part of an interior drainage system the Caspian lake is slightly saline. Average salinity varies between 12.80 and 12.85 percent but drops to less than 1 percent across the mouth of the Volga river. It increases generally from north to south and from west to east, as the most important tributaries are on the northern and western coasts. Average salinity is thus 9.28 percent in the northern basin, 13 percent in the central basin, and 13.1 percent in the southern basin; these figures are slightly higher at greater depths. Salinity is, however, considerably higher in several more or less enclosed gulfs along the eastern coast, particularly the Kara Bogaz lagoon, where it reaches 35 percent. In the northern basin salinity diminishes sharply in summer, owing to the heavy influx of fresh water from the tributary rivers in the spring; it rises again in winter. Comparable variations in the center and the south are very slight.

There are important differences in the prevailing water temperatures at different longitudes. In the north, although surface temperatures rise to 24° C in summer, in winter, which generally lasts from December to March, the sea freezes down to approximately isobath - 12 m. Ice floes can appear as far south as Derbent (Darband). In the south surface temperatures are above 28° C in summer; in winter they generally do not fall below 9° C. In the central and southern basins the temperatures of the homogeneous depths below 500 m are constant at 4.8-5.0° C and 5.8-5.9° C respectively. Cascading of oxygenated surface water thus cannot occur there; no such

interchange seems to have taken place even in the winter of 1333/1914-15, when the surface temperature in the south dropped to 6.7° C. The result is a situation comparable to that in the Black Sea (euxinism), with rates of hydrogen sulfide up to 0.2-0.3 cm^3 per liter, precluding all animal life below 200-300 m over about half the area of the lake. In the absence of circulation between surface and deep waters, these differences in salinity and temperature generate complex systems of currents in the surface waters, which are affected still further by the flow from tributary rivers. In the northern and central basins there is a swift counterclockwise current generated by the force of the Volga waters as they push south along the western coast. In the northeastern sector another circular current flows in the same direction but is independent of the first. In the southern basin there are two systems of currents: one flowing clockwise along the coast from the Apsheron peninsula to the mouth of the Araxes, the second and more important moving counterclockwise along the entire Persian section of the coast, which is thus washed by a steady current from west to east (Dobrovol'skiĭ and Zalogiĭ, p. 27; Kasymov, p. 20).

II. Fluctuations in level.

Short-term fluctuations. Practically speaking there are no tides in the Caspian, but it does experience short-term fluctuations in level, owing to variations in barometric pressure; a rise of 1 mm on the barometer is reflected in a fall of 13.5 mm of the sea level (Mofakham-Pâyân, p. 96). Much more important are fluctuations caused by the winds, particularly in the shallow northern basin; in the Volga delta southerly winds can raise the water level as much as 3.60 m above normal. Such variations are clearly much greater than the annual rise and fall (Mofakham-Pâyân, pp. 112-13), which are associated with variations in riverine flow, precipitation, and evaporation. This cycle, though quite regular, differs from north to south. In the northern and central basins the maximum height occurs in May or June, the winter minimum being less predictable because of freezing; the amplitude of the annual fluctuation is 0.4-0.5 m. In the southern basin the maximum always occurs in July and the minimum at some point between December and March; the average amplitude of the swing at Baku is 0.32 m.

Secular fluctuations in historical times (cf. Varushchenko et al., superseding abundant earlier literature). The first levelings of the Caspian were taken, by purely barometric methods, in the 12th/18th century. But it became possible to establish sea levels with reasonable accuracy only after methods of taking geodesic levelings had been developed. On the Caspian the first such readings were taken in 1252/1836-37 by scientists at the Academy of Sciences in St. Petersburg, who arrived at a corrected figure of - 25.51 m. Geodesic levelings were recorded regularly throughout the modern period from 1272/1855-56 to the 1925 reading in the U.S.S.R., with the Black Sea as base line, and the 1306 Š./1927 reading by the American engineers for the Transiranian railway, with the Persian Gulf as base line; both yielded readings of - 26 m. Regular observations have been made at Baku since 1851. After 1306 Š./1927 the level remained fairly steady, with minor changes of less than a meter, until 1311 Š./1932 (- 25.69 m), after which it dropped sharply to - 27.45m in 1320 Š./1941, then more gradually with brief reversals until 1356 Š./1977, when it reached its lowest level (- 29 m) in modern times. Since then it has risen rapidly, more than 1 m by 1365 Š./1986 (Kasymov, p. 32). These fluctuations have resulted in notable changes in the total surface area of the Caspian Sea. Estimated at 436,000km^2 in 1332/1914 and at 422,000 km^2 in 1348 = 1308 Š./1929, it was only 36l,000km^2 in 1350 Š./1971. All measures of surface area are thus valid only for the periods at which they were taken. The

fluctuations have naturally affected the much shallower northern basin more severely; in certain areas the Volga delta has advanced about 50 km since the beginning of the century.

Although there are no precise readings for periods before the beginning of the 13th/19th century, a combination of archeological and geomorphological methods permits reliable reconstructions at least back to the centuries immediately preceding the Christian era. The level of the Caspian must have been at - 20 m in the 5th century b.c. and must have fallen to - 32 m in the 2nd century b.c. It rose to - 22.5 m in the 1st century of the Christian era, then fell to - 28 m al the end of the 2nd century, rising to - 24 m in about a.d. 400 and falling again to - 34m at the end of the 6th century. In the 3rd/9th century it rose to - 28 m but then fell sharply to - 36m in the 4th/10th century. It seems to have remained stable at - 32 to - 33 m for several hundred years before rising rapidly to - 24 m in about 700/1300. From that high point it dropped in stages to - 29 m in the 9th/15th century, followed by a rise to - 26.5 m in the next and to - 23 m by the beginning of the 11th/17th century, only to fall to about - 26 m at the end. It rose to - 22 m toward the end of the 12th/18th century, before undergoing a steady decline to the levels recorded in the middle of the 13th/19th century (for charts see Varushchenko et al., pp. 68-69, 77).

Secular fluctuations over the geological time scale. These historical fluctuations are only the latest episodes in a series of what were originally much wider shifts. Just since the end of the glacial period the six recognized fluctuations (see Varushchenko, p. 40) seem to have diminished progressively in amplitude, describing a generally descending curve; an absolute minimum of - 50 m occurred in about 7000 b.c. and maximums of - 16 m in about 6500 and 4000 b.c. This trend has predominated throughout the Quaternary: Between 400,000 and 300,000 years ago the Caspian reached a maximum absolute height of 200 m, whereas the minimum levels were below the level of the ocean (Varushchenko et al., p. 36). The Caspian is only the remnant of a very much larger Quaternary body of water, which also included the Aral Sea. The general lowering trend seems to have been halted in the 4th millennium b.c.; since then the sea level has fluctuated around an average that has not changed noticeably (Varushchenko et al., pp. 112-13).

All these changes essentially reflected modifications in the climate, particularly in the system of temperatures, summer evaporation seeming to have been the principal factor. The levels of the Caspian Sea are thus excellent indicators of the general evolution of climates in the northern hemisphere. On the other hand, the role of the earth’s movements appears to have been negligible, except around the Apsheron peninsula, which has been tectonically unstable throughout the Quaternary and where earlier levels cannot be taken as reference points. Overall, then, the maximum levels of this landlocked sea have corresponded to cold periods (during glacial advances), when evaporation was minimal, and the minimum levels to warm (interglacial) periods, when evaporation was maximal, following a rhythm opposite to that of the general levels of the oceans. As for human intervention, which in the present period is reflected in increasing diversion of water by means of irrigation dams on the rivers, interpretations published in the 1350s Š./1970s (e.g., Ehlers, 1971a; Hollis) attributed to it a role of growing importance in the general lowering of the water level that was in progress at that time. In fact, the rise in the water level over the past decade proves that this role, though undeniable, is nevertheless insignificant in comparison to that of variations in climate, which have been the determining factor throughout the Quaternary.

III. Formation of the basin.

The Quaternary Caspian is itself only the latest in a series of basins that have experienced a complex development under the influence of dominant tectonic phenomena before the Quaternary (for a good synthesis of Soviet work, see Barīmānī, pp. 66-88). The first phase, following the breaking up of the Tethys, the large ocean that once extended from the present Mediterranean to the Pacific, was the emergence in the Upper Miocene of the Sarmatian Sea, a vast landlocked body of water extending from the lower Danube basin to the Aral Sea. This sea shrank at the beginning of the Pliocene to a Ponto-Caspian sea, encompassing approximately the present Black and Caspian seas, which receded still farther in the Middle Pliocene, becoming a freshwater lake corresponding approximately to the southern basin of the present Caspian (Cheleken phase), only to swell again in the Upper Pliocene to a basin approximately coterminous with the present Caspian (Akchaqyl phase) but still connected to the Black Sea via the Manych trench. This link was finally broken, and the Caspian became permanently landlocked, whereas the opening of the Dardanelles linked the Black Sea to the Mediterranean.

IV. Biogeography.

The complexity of the geological history and the corresponding hydrological shifts is reflected in the heterogeneity of the Caspian fauna (Kasymov, pp. 54-134). That there are two fundamentally different trophic systems (Marti et al.) is clear. The first, in the north, is based on organic materials of continental origin, which are exploited by vestigial benthic fauna and especially by originally freshwater fish more or less adapted to life in salt water and practicing genetically determined anadromous migration. The other, in the south, is based on marine plankton consumed by a benthic population of Mediterranean type and a population of oceanic ichthyofauna that is a remainder from the Tethys. In fact, however, these fauna are not very oceanic. True oceanic groups—echinoderms, cephalopods, tunicates, selachians, and the like—are not found there. Of the remaining forms 64 percent consist of indigenous types. Although abundant in individuals in the surface waters, this array of fauna is relatively poor in species in comparison with that of truly marine bodies of water.

Invertebrates account for 1,394 of the total of 1,814 species, that is, 77 percent. Among the coelenterates are *Cordylophora caspica*, *Bougainvillia megas*, and the jellyfish *Moerisia pallasi* and *Moerisia maeotica*. There are a single sponge, *Metschnikowia tuberculata*, numerous worms, 265 species of crustaceans, and 118 species of mollusks. There are only 100 species of fish (Kasymov, pp. 78-106; Kazancheev) in the Caspian, compared to 180 in the Black Sea and 540 in the Mediterranean. The main families represented are the *Cyprinidae* (twenty-four species, largely anadromous), the *Gobiidae* (thirty-five species, benthic), and the *Clupeidae* (eighteen species, mainly oceanic). There are five species of *Salmonidae* (salmon) and seven species or varieties of *Acipenseridae* (sturgeons), one lamprey (*Caspiomyzon wagneri*), and a large catfish (*Siluris glanis*, Pers. *esbela*), which can reach 250 cm in length and weigh as much as 100 kg.

The anadromous fish, which mainly inhabit the coastal waters, include a certain number of aristocratic species that are especially sought after for food: surmullet (*Rutilus frisii kutum*, Pers. *māhī safīd* “white fish”), bream (*Abramis sp.*, Pers. *sīm* “silver”), northern pike (*Esox lucius*),

salmon (*Salmo caspicus*, Pers. *āzād*), pike perch (*Lucioperca sandra*, Pers. *sūf*), carp (*Cyprinus carpio*, Pers. *kopūr*), and the previously mentioned catfish. The most abundant is the roach (*Rutilus rutilus caspicus*, Pers. *kolma*), which lives especially in the northern surface waters, where salinity is relatively low, below the isohaline 10-11 percent. After wintering under ice at less than 3 m depth it swims upriver in April, returns to the sea in summer, and once again moves in close to the coasts in autumn. Shad (seventeen species and subspecies, of which six have commercial value; Pers. dial. *šag māhī*), sometimes erroneously identified as herring by Western authors, are also found, especially *Alosa caspia caspia*, *Alosa kessleri volgensis*, and *Alosa brashnikovi*, which feed mainly in the shallow waters of the northern Caspian but in winter sink to a depth of 40-50 m. Some of them are anadromous, but others never leave the sea.

Pelagic species are represented especially by small fish (ca. 10 cm) of the genus *Clupeonella*, of which there are three species (Rus. dial. *kil'ka* > Pers. *kelka*). They are migratory; the adults spawn each year in the central and northern coastal waters and in winter sink deeper in the central and southern basins. The least common species, *Clupeonella delicatula*, can still be found, especially in coastal waters. *Clupeonella engrauliformis* and *Clupeonella grimmi* are the most characteristic forms of the central and southern basins; the latter is not found at all in the north.

Finally, the sturgeons (*Acipenseridae*) constitute a transitional group. Only the adults undertake anadromous migrations to spawn, and such migrations take place only every three-to-five years. From the commercial point of view four species are particularly important for their flesh and their roe; the latter is processed as caviar. The most common is the sevruga sturgeon (*Acipenser stellatus*; Rus. *sevryuga*; Pers. and Tk. *ūzūn būrūn* "long nose"), which is generally 1-1.30 m long. Also abundant are the slightly smaller Russian sturgeon (*Acipenser guldenstädti* Brandt) and Persian sturgeon (*Acipenser guldenstädti persicus* Borodin), both known in Russian dialect as *osetr* (> Pers. *āssetrā*; cf. more common Pers. *tās-māhī*). Finally, the great Russian sturgeon (*Huso huso*; Rus. *beluga*; Pers. *fīl-māhī* "elephant fish"), which belongs to another genus, is found fairly frequently in the Caspian. Its length can reach 5 m and its weight 1,500 kg. The bare-bellied sturgeon (*Acipenser nudiventris*; Rus. *ship* > Pers. *šep*), smaller than all the others, is considerably rarer, as is the sterlet (*Acipenser ruthenus*; Rus. *sterlyad'*).

The aquatic fauna provide abundant nourishment for the 312 species of birds that inhabit the Caspian, among them two swans (*Cygnus olor* and *Cygnus cygnus*; Pers. *qū*), the pelican (*Pelecaunus crispus*; Pers. *ḥawāsel*), two species of cormorant (*Phalacrocorax carbo* and *Phalacrocorax pygmaeus*), the pink flamingo (*Phoenicopterus roseus*), and many species of geese and ducks. On the other hand, only one mammal is found in the sea, the Caspian seal (*Pusa caspica*), averaging 1.50 m in length and 70 kg in weight, with affinities to the Arctic species. It is common in both the northern and southern waters, but the most important concentrations can be observed on the islands in the spring and fall and on the northern ice in winter. Located at the top of the food chain and without direct competition, its population in the wild once reached considerable numbers, probably more than a million head (Kasymov, pp. 121-22).

History of the maritime Caspian space.

I. In Antiquity.

Before the Muslim conquest of Persia the Caspian Sea was little known and little used. Throughout the entire period it remained on the margins of the great civilizations, far from the centers of population, and the history of geographic knowledge about it is the history of a series of trials and errors. The Assyrian troops of Adad-Nirari III (805-782 b.c.) were acquainted with it and called it the "great sea of the rising sun" (Herzfeld, p. 196). The Greeks became aware of its existence at an early date through the reports of merchants from their Black Sea colonies, who transmitted some detailed information; as early as the 5th century b.c. Herodotus (1.203) recognized that the Caspian is a landlocked sea. That the Greeks' knowledge was essentially limited to the southern part of this body of water, however, is attested by the two names by which it was known. The first was Caspian Sea (*Caspia*), already known to the 5th-century geographer Hecataeus, after the Caspians (*Caspioi*), who had inhabited Caucasian Albania on the western coast north of the Araxes but had already disappeared at the beginning of the Christian era (Strabo, 11.45). The second was Hyrcanian Sea (*Hyrcania*), after a land and people of the southeastern coast (cf. Gorgān < *Vṛkāna* "land of the wolves," mentioned in the Bīsotūn inscription par. 35; cf. Herzfeld, pp. 320-22), attested slightly earlier by Scylax of Caryanda (fragment 291, attributed to Hecataeus by Stephen of Byzantium in a.d. the 6th century). Herodotus' exaggerated report (1.203) of the distance across it (eight sailing days), combined with his correct estimate of the longitudinal distance (fifteen days), can be explained only in terms of navigational routes that adhered closely to the curve of the southern coast (Camena d'Almeida, pp. 16-17). Although the Caspian is mentioned in Indo-Iranian traditions (Uruḫkakṣa in Rigveda 6.45.31; Av. Vourukaša; cf. Brunnhofer, pp. 39-42), it seems to have been almost totally unknown to the Achaemenids, whose imperial centers were all located in inland Persia and Mesopotamia and for whom the wooded mountainous fringes of the southern Caspian littoral constituted a forbidding barrier.

Thus, the Greeks who accompanied Alexander in his invasion of the Persian cultural area could not turn to the Persians for more precise information on the Caspian. The newcomers' notions about the sea were nevertheless very confused, largely owing to the influence of Ionian geography, the basic principles of which did not yet include the concept of a large enclosed body of water; all seas were considered simply as parts of an immense external ocean. That was certainly the opinion of Hecataeus (cf. Goukowsky, I, p. 347, with abundant earlier bibliography). Although Aristotle did teach his pupil Alexander that the Caspian was a landlocked sea (*Meteorologica* 2.1.10; written between 341 and 327 b.c.), he himself was already preoccupied with the possibility of a subterranean link with the Black Sea (1.13.29), which would have conformed to the generally accepted model. In the absence of evidence for such a link the circle of learned men who accompanied Alexander canvassed all possibilities, including the idea that the Caspian was only a gulf of the Arctic Ocean (Camena d'Almeida, pp. 23ff.). This idea was accepted in a text attributed to Aristotle (*De mundo* 3.12), written only slightly later than the *Meteorologica*. In the last period of his life, probably in 324 b.c., Alexander decided to send an exploratory expedition to the Caspian, which he apparently entrusted to Heracleides (Arrian, 7.16.1-4; cf. Goukowsky, I, p. 348), but the conqueror's sudden death prevented the realization of this plan. The Greeks were, however, able to determine that the water of the Caspian is less saline than that of the Mediterranean. In the years immediately following the death of Alexander the Caspian continued to be treated as a landlocked sea in the

geographical systems constructed, for example, by Cleitarchus (reconstruction in Goukowsky, I, p. 156) and Polycleitus (p. 161), who identified it with Palus Maeotidis (the Sea of Azov). Alexander's exploration project was taken up again only forty years later by Seleucus I Nicator (r. 305-281 b.c.), who sent his naval commander Patrocles to the Caspian. Patrocles' journey (Naumann; Pauly-Wissowa, IX/1, cols. 454-526, XVIII/4, cols. 2263-73), the report of which has been transmitted only in fragments, probably by Aristobulus and certainly by Eratosthenes, can be reconstructed only in broad outline. Having first followed a portion of the west coast, probably as far as the mouth of the Kura, he then returned to his point of departure and set out to follow the east coast; he halted at some indeterminate point without having achieved a complete circumnavigation and thus returned with the totally false idea that the Caspian Sea was a gulf of the exterior ocean. This idea was nevertheless accepted without discussion by ancient geographers down to the time of Strabo (11.6.1), Pomponius Mela (1.2; 3.5), and Pliny (6.15). Only Ptolemy, when he learned of the existence of two large tributary rivers (the Volga and the Ural) flowing from the northern regions (6.13) and the diverse populations that separated the Caspian from the ocean, arrived at the notion of a landlocked sea, though he confused it with the Aral Sea. The earlier false ideas nevertheless continued to be widely accepted. Agathemerus (3.13) thought the Caspian was linked to the ocean. Two centuries later Macrobius (early 5th cent.), though he was familiar with both theories, gave preference in his *De Somnio Scipionis* (Commentary on Cicero's *Somnium Scipionis*, 2.9) to the notion of an oceanic gulf. This tradition continued in European science throughout the entire Middle Ages, and the point was definitively settled only after the Christian missions visited the Mongol court in the middle of the 7th/13th century. William of Rubruck, who made the journey in 651-54/1253-56, was the first to challenge the declarations of Isidore of Seville and declare that the Caspian is not a gulf of the ocean (Michel and Wright, p. 265).

In those early centuries no regular commercial traffic of any importance seems to have crossed this little-known sea, which was shunned because of its storms, celebrated even in Latin poetry (Horace, 2.9), and located on the distant frontiers of the great centers of civilization. Patrocles' conclusion that large quantities of Indian merchandise were traded via the Oxus to Albania, the Cyrus (Kura) river, and the Pontus-Black Sea region was repeated by Strabo (2.1.15, 11.7.3), then by Varro and Pliny (6.52), and an echo is still to be found in Ammianus Marcellinus' report (23.6.51) that the majority of the Hyrcanians made their livings from maritime trade. This report, which seems quite fantastic, grew out of a simple guess by Patrocles, who must have confused the mouth of the Atrek with that of the Oxus and thus suggested to Antiochus I Soter (r. ca. 293-61 b.c.) a possible route to India. But of such a route there exists no proof of any sort. On the contrary, there are compelling negative arguments: the fact that the name of no harbor, even on the southern sections of the coast, was known in antiquity and particularly the passage in Strabo, perhaps taken from Aristobulus, in which he clearly states, in contradiction to the passage already cited, that the Hyrcanian Sea was "without ships and unused" (*áplous te oûsa kai argós*; 11.7.2). It is obviously necessary to give up the idea of such an "Oxo-Caspian route" (Tarn, pp. 112-13, 488-90), though its existence is still accepted in many contemporary works of synthesis (e.g., Schur; *İA*, p. 410). During the Sasanian period, however, a certain amount of trading activity may have developed, at least on the southern part of the sea. The report by Theophanes at the end of a.d. the 5th century that the "markets and ports frequented by the seres" (silk merchants; *tá te Surôn empória kai toùs liménas*), had only slightly earlier had three successive masters (Persians, Hephthalites, and Turks) can be interpreted only as referring to ports on the

Caspian (Heyd, I, p. 4). And, at least on the western coast, the power of the Sasanians extended quite far to the north, as far as Darband (Derbent), which was fortified by Ḵosrow Anōšīravān (a.d. 531-79; Markwart, *Ērānšahr*, pp. 105-07).

II. In Persian Islamic civilization (2nd-10th/8th-16th centuries).

Exploitations of the Caspian sea developed only slowly and gradually after the Islamic conquest of Persia. During almost two centuries the mountainous barrier of the southern Caspian sheltered important pockets of indigenous resistance and several independent Zoroastrian principalities, which blocked the predominant Persian Islamic civilization of the plateau from access to the sea. Commercial relations between the Muslim successors to the Sasanians and the inhabitants of the northern steppes were at first conducted via the established stages of the land route to the west of the Caspian. This orientation did not favor maritime activity or even a quest for detailed knowledge of the sea.

Early names for the Caspian Sea. Nothing better illustrates the hesitations and gaps in Islamic geographers' knowledge of the Caspian region than the extraordinary variety of names that they attributed to it ("Baḥr al-Khazar," in *EI*^{2}; "Hazar Denizi," in *İA*; Miquel, III, p. 342; for the longest, though still incomplete, list, including a total of thirty-seven names, cf. Mofakham-Pâyân, pp. 14-25, with map). These names are essentially those of countries, cities, and riverine peoples. The following designations are thus found among the Muslim authors: Abaskūn (or Ābaskūn), Astarābād, Jorjān (Gorgān), Ṭabarestān, Māzandarān (from the 6th/12th century, surviving in modern Persian as Daryā-ye Māzandarān), Sārī, Deylam, Jīlān (Gīlān), Moḡān, Bāb and Bāb al-Abwāb (Darband), and Šīrvān. In particular the name of the Khazars, a Turkic people that has predominated around the northern and western parts of the sea north of the Caucasus since Arab Islamic culture was established, appears in the designation Baḥr al-Ḵazar (Sea of the Khazars), the name most frequently used by Arabic authors of the classical period; it is still preserved in modern Turkish Hazer Denizi and the common Persian Daryā-ye Ḵazar. There were also less specific names like Baḥr al-Jabal (Mountain sea; Jabal being the name currently applied to the Persian plateau) or Baḥr al-Aʿājem (Barbarian sea). Maqdesī (Moqaddasī, III, p. 353) called it simply Boḥayra (The lake). Other designations were drawn from countries that, though not adjacent, were supposedly near the sea, like Khorasan (Baḥr al-Ḵorāsānī; Masʿūdī, *Tanbīh*, p. 90; Ebn Faqīh, p. 7) or even Ḵʷārazm, owing to an obvious confusion with the Aral Sea. In the same way the Turkic tribes hesitated among several descriptive names, like Deniz (The sea), Ak Deniz (The white sea, i.e., The southern sea), Kuzgun Denizi (Sea of crows, or rather Sea of cormorants, which have black plumage like that of crows), and Qorzum Denizi (Sea of beavers; Demašqī, pp. 194-95), as well as ethnic names like Oğuz Denizi (Baḥr-e Ḡūz, Sea of the Oghuz). These Turkish names were also commonly used in Persia.

Misunderstanding and miscopying of so many different and often imprecise names have given rise to a great many errors or transpositions in the texts, for example one already noted in the 7th/13th century by Mostawfī (*Nozhat al-qolūb*, ed. Le Strange, I, p. 239, II, p. 231) in which the Red Sea (Baḥr al-Qolzom) was confused with the Caspian (Baḥr al-Qorzūm). A certain number of these names have also passed, in more or less mutilated form, into European texts, for example, Mare Servanicum (< Šīrvān) mentioned by Vincent de Beauvais, Sea of Gheluchelen or Ghelachelan (< Gīl or Gīlān) by Marco Polo (cf. Darya Ghilani by Pedro Texeira), Bascon

Sea (< Abaskūn) by Odorico de Pordenone (Polo, I, pp. 58-59 nn.), and White Sea, a translation of Ak Denizi as an obvious parallel to Black Sea (Schiltberger, p. 45).

Development of geographical knowledge. All these errors and confusions obviously reflect a very imperfect scientific knowledge of the Caspian. It is possible, however, to discern a certain amount of progress over the course of time. In the 3rd/9th century Ebn Ḵordāḏbeh (p. 134), Ḵʷārazmī (pp. 80-81), Ebn Rosta (p. 86), and Ebn Faqīh (pp. 7-8) took no position on the possible isolation of the Caspian, but Yaʿqūbī (*Boldān*, p. 354, tr. Wiet, p. 219) still accepted the idea that it communicated with the exterior ocean. In the 4th/10th century the anonymous author of *Ḥodūd al-ʿālam* (tr. Minorsky, p. 53), though he described its perimeter, remained silent on the possibility that it might be landlocked. But from that time on this cautious attitude began to disappear. Masʿūdī (*Morūj*, tr. Pellat, I, p. 167), Eṣṭaḵrī (pp. 217, 227), and Ebn Ḥawqal (tr. Kramers, II, p. 378) concluded unequivocally that the Caspian is an enclosed sea, though Masʿūdī still accepted the idea that it communicated with the Black Sea via a branch of the Volga (p. 164); he was thus able to explain earlier opinions that there was communication between the Caspian and the Black Sea. The idea of the Caspian as a landlocked sea had thus finally been accepted, but it had taken two centuries.

At the same time descriptions grew more precise, incorporating more and more detail, especially that of Ebn Ḥawqal. The dimensions of the sea remained uncertain, however, and reports were often quite exaggerated: Ebn Ḵordāḏbeh, 3,000 km in diameter; Ebn Rosta, 3,500 x 1,200 km; Ebn Faqīh, 1,800 x 1,800 km in one place but 600 x 600 km in another; Masʿūdī 1,500 x 1,200 km. The actual dimensions average about 1,200 x 300 km (cf. Miquel, II, p. 531). The Caspian, with its dark waters and murky depths, also continued to be viewed as extremely forbidding (Mostawfī, I, p. 239, II, p. 231), the natural habitat of such marvels and dangers as a formidable dragon (*tennīn*; Masʿūdī, tr. Pellat, p. 109). Its waves were believed higher and more dangerous than those of other seas, and there was thought to be a whirlpool that sucked in ships and swallowed them (Mostawfī, II, p. 232).

Commercial activity. From the 2nd/8th to the 7th/13th century the Caspian Sea was part of the northern frontier of Islam. The advances in knowledge outlined corresponded to a concomitant development in trade relations, which were first established among Muslim ports in the south; the two principal such ports were at opposite ends of the southern coast, at Abaskūn and Bāb (Darband). The first was a large silk market. The second exported linen clothing; madder, which was produced on the neighboring islands and sent to India via the ports of Gorgān; and a large number of slaves from the neighboring infidel lands of the Caucasus (Ebn Ḥawqal, tr. Kramers, II, pp. 332-33, 340, 378). Baku exported naphtha. There was also a continuous coastal trade between the ports of Gīlān and those of Deylam and Āmol (Masʿūdī, tr. Pellat, I, p. 168).

But a north-south trade also developed, between the southern coast and the Khazar ports in the north, especially the capital, Atīl, on the lower Volga. From Khazar country itself there was little more than fish glue to be had, but the Khazars reexported slaves, honey, wax, beaver skins, and furs from Russian and Bulgar lands. In exchange Gorgān and Ṭabarestān furnished clothing produced by Muslim craftsmen (Ebn Ḥawqal, tr. Kramers, II, p. 385).

Fishing was also very active, giving rise to large concentrations of population in Dehestān, about fifty farsangs northeast of Abaskūn, and furnishing the Khazars with a large part of their diet (Ebn Ḥawqal, tr. Kramers, II, pp. 379, 382). Pelicans and falcons were hunted (*Ḥodūd al-ʿālam*, tr. Minorsky, p. 60) in Dehestān as well, and falcons were also trapped on the islands situated off the Gorgān coast (Masʿūdī, tr. Pellat, I, p. 168).

The evidence suggests that, after the fall of Khazar power at the turn of the 5th/11th century and the rise of the Comans, which coincided with the general decline of the Islamic caliphate in Baghdad, maritime trade between Muslim countries and the northern steppes via the Caspian gradually came to a halt. There is, however, no reason to suppose that there was a cessation in activity on the Islamic southern sector of the sea.

From the 7th/13th to the 10th/16th centuries the Caspian Sea was in fact an Islamic lake. The Mongol conquest and the subsequent conversion of the Golden Horde to Islam led to a completely new political situation after the 630s/1230s, and the Caspian area became, at least for a time, totally integrated into a single overarching political and cultural unit. As a result conditions favored a significant development of maritime trade, and the Caspian thus came to function as a link in the great commercial route by which Europe received merchandise from Central Asia and India via the Black Sea. Already in the years immediately after the Mongol conquest Marco Polo (I, p. 52) noted that the Genoese had been plying the Caspian for several years, carrying silk from Gīlān, to which the products of other sections of the coast were soon added: in particular Ṭāleš was mentioned by Antonio Pegolotti in 740/1340 (s.vv. Talani, Taliva). In this period spices arrived at Astrakhan from India and were then brought overland to Tana (A. Contarini, in *Travels to Tana*, p. 151). Within about a century later Italian merchants had become much more familiar with the Caspian, as is attested by the large number of names included on the *Carta Catalana* of 1375 (Bib. Nat., ms. espagnol 30, fol. 3 verso-4). Several new names also appeared in European sources at this period, for example, Sea of Saray, after the capital of the Golden Horde on the lower Volga, and Sea of Baku (Onda di Baccu), which passed into a number of Italian literary texts (e.g., *Orlando innamorato* XVII, p. 60; *Sfera* by Lionardo Dati, ca. 1390; cf. Marco Polo, I, p. 59 nn.). There was an extensive fishing industry, and salted sturgeon from the Caspian was exported overland as far as Tana and from there by sea to Constantinople (Pegolotti, p. 380).

Timur's destruction of Astrakhan and Saray in 798/1395-96 dealt a harsh blow to maritime commerce on the Caspian; thenceforward Italian merchants transported silk mainly over the land route from Solṭānīya, where production was concentrated (Clavijo, p. 93). But activity on the Caspian remained sufficiently important to sustain the depredations of Italian pirates, which did not cease. In 775/1374 Luchino Tarigo, a Genoese from Kaffa (Feodosiya) in the Crimea, amassed a great deal of booty there (Heyd, II, p. 376-77), and in 831/1428 a Venetian named Giovanni de Valle came, at the invitation of the khan of Darband, and began to capture ships sailing out of Astarābād (*Travels to Tana*, pp. 5-6). Nevertheless, at the end of the 9th/15th century there was still a certain amount of trade between Darband and Astrakhan. It was carried on between spring and fall, and methods of navigation were still fairly primitive; the ships never strayed far from the coast (remarks of Contarini in 881/1476; *Travels to Tana*, p. 146). According to the reports of Giovanni Maria degli Angiolelli in 915/1510 (p. 114), the ships had ranged up to 800 tons; the subsequent drop in sea level, however, limited those that could enter

the harbor of Darband to 200 tons. They carried rice, silk, and textiles loaded at Darband and returned from Astrakhan with furs. Astrakhan probably received silk from several other sources as well (Contarini, in *Travels to Tana*, pp. 147, 151). According to Contarini, the fishing industry seems to have thrived, and in summer "Tatars" gathered on the islands to fish (*Travels to Tana*, p. 148). Seals were already being actively hunted, and their oil was used both for light and as a salve for camels, but the same Italian observer reported that fishing methods were primitive and that many species could not be caught at all (*Travels to Tana*, pp. 145-46).

The first Russians on the Caspian. The Russians had so far played only a sporadic role in the mercantile life of the Caspian. In the 3-4th/9-10th centuries Russian ships had several times conducted marauding raids from beyond the Khazar steppe downriver to the southern coasts of the Caspian: the first in Ṭabarestān during the reign of Sayyed Ḥasan b. Zayd (250-70/864-84), a second and third in 297/910 and 298/911 respectively (Ebn Esfandīār, tr. Browne, p. 199), and a fourth after 300/912-13, when Baku and Abaskūn were sacked (Masʿūdī, *Morūj*, tr. Pellat, I, pp. 166-67; cf. bibliography, *EI*^{2}, p. 931). These incursions, which were part of the great Viking invasions, were not repeated, however. In the Mongol and post-Mongol periods the Russians no longer had regular access to the sea. In 870/1466 the ship of Vasily Papin, ambassador to the khan of Šīrvān, was able to sail out of the mouth of the Volga, but the Tatars of Astrakhan pillaged a following boat, on which the merchant Athanasius was traveling. With the ambassador from Šīrvān, who was himself returning from Moscow, Athanasius had to embark on another vessel in order to reach Darband. A third small boat, which was accompanying them, was driven against the coast and also captured by the Tatars (*Khozhdenie*, pp. 8-10). On his return from India Athanasius was forced to take the more secure route via Azerbaijan, Trabzon, and the Black Sea to Kaffa, in order to regain Russian territory (*Khozhdenie*, pp. 71-72).

III. Russian predominance (mid-10th/16th century to World War I).

British enterprises and Ottoman ambitions (2nd half of the 10th/16th century). The definitive conquest and fortification of Astrakhan by the Russians in 964/1557 marked the beginning of a new period in the history of the Caspian. Several Muscovite merchant firms developed there, notably in the vicinity of Mangyshlak, the point of departure for caravans to Khiva and Bukhara. English adventurers very quickly followed in their footsteps, seeking a direct land route to India. Anthony Jenkinson traveled to Bukhara via Astrakhan and the Caspian in 966/1558-59 and to Persia via Astrakhan, Darband, and Shemakha in 970/1562-63; the tsar granted trading privileges to British merchants in 1564 (*Early Voyages*, pp. 228-36). There was obviously an opportunity to be exploited: Jenkinson noted that there were "fewe shipps upon the Caspian seas" (*Early Voyages*, p. 98). The boats used by the British were small, 30 tons at most (A. Edwards, in *Early Voyages*, p. 383), but commercial activities were nevertheless soon organized: silk from Gīlān, spices from India, and precious stones were traded for textiles, firearms, and other manufactured products from England (*Early Voyages*, pp. 391-92, 398-99, 405-06).

These early developments were cut short, however, by the interference of the Ottoman Turks. In 975/1569 the latter organized an expedition to Astrakhan, with the assistance of the khan of the Crimea and the Noghay Tatars of the steppes (Kurat, 1966). After having attempted in vain to transport their galleys by dragging them across the narrow neck of land between the bend in the Don and the lower Volga and after having recognized the impossibility of trying to dig a canal,

they finally attacked by land and failed lamentably, but another undertaking was more successful and was capped by the occupation of Darband between 986/1578 and 1015/1606. An Ottoman plan to make use of Venetian renegades to help construct a fleet on the Caspian, with Darband as home port, did not succeed; in fact, this projected fleet never amounted to more than a small force of nine galleys, each requiring only twenty-eight oarsmen (*fuste di 14 bianchi*; Bennigsen and Berindei, p. 78). A new plan to attack Astrakhan in 996/1587-88 was also a failure. But all these efforts were sufficient to interrupt trade between Astrakhan and Persia, and the British company had to cease its activities. At the end of the 10th/16th century the Caspian had thus once again become a disputed area, to be avoided by travelers. The Ottoman embassy of Piyale Pasha to the khan of the Uzbeks in 989/1581, as well as that of ʿAbd-Allāh Khan, Uzbek envoy to Istanbul in 995/1587, were forced to follow the land routes south and north of the Caspian Sea respectively (Bennigsen and Berindei, pp. 72-73).

Russian advances and Persian intentions (early 11th/17th cent.-1244/1828). It was in fact only in the 11th/17th century, after the conclusion of the disturbances that accompanied the advent of the Romanov dynasty in 1613, that the Russians undertook systematic advances in the Caspian region (Nagdaliev). In 1624 Tsar Alexis Mikhailovich issued a ukase ordering the establishment of shipyards at Astrakhan, and at the same time cartographic work began. The Russians nevertheless advanced fairly slowly throughout the 11th/17th century. In 1637 Adam Olearius, secretary to the Danish embassy to the Persian court, noted that navigation was still strictly limited to the summer season and that "the Persians, Tartars, and Muscovites . . . having only poor little boats . . . can only sail along the coasts" (p. 232). The pilot whom the ambassador had taken on at Astrakhan to guide him to Darband was so totally ignorant of navigation that it was necessary to have recourse to a Persian merchant (Olearius, p. 214) for help. The embassy returned to Europe via the land route along the western coast. In 1056/1646 the Ottoman traveler Evliya Çelebi (Awlīāʾ Çelebī) took note of a thriving trade at Baku, conducted by Russian, Kalmuck, and Chinese merchants. The Russians purchased salt, saffron, petroleum, and silk and sold furs and leather (p. 297). There were "a thousand ships" on the sea, but the traveler remarked on their small size, compared to the size of ships on the Mediterranean and Black Seas, where he had traveled previously (p. 300). It is certain that maritime trade on the Caspian continued to be conducted essentially in Muslim ships. The Russians had hardly shown themselves in the southern part of the sea, except for Cossack raiders, whose attacks were very much feared by Muslim navigators (Çelebi, p. 300). Such depredations were more common on the Caspian because Ottoman power, then at its height, made expeditions on the Black Sea more dangerous. The most spectacular of these raids, an indication of the military weakness of the Persian ships, was that carried out by Stenka Razin and his Don Cossacks in 1077/1667 (Stepanov, I, pp. 310-70); they sallied forth from the lower Volga, equipped a fleet and manned it with more than 2,000 men, and raided Darband in 1078/1668. They then installed themselves on the Persian coast, from which they raided Farahābād in Māzandarān. After wintering near Baku the Cossacks, in Moḥarram 1080/June 1669, destroyed a Persian fleet that had been hurriedly equipped and manned with 4,000 men. The Persian ships were chained together in order to prevent the Cossacks from sailing between them, but the flagship was hit in the powder magazine by a well-aimed bullet and exploded. Only three Persian ships escaped. The Cossacks returned to take Astrakhan, and it was only the armies of the tsar that finally succeeded in putting a stop to them. The danger from the Cossacks gradually paralyzed Persian maritime activity on the Caspian. Nevertheless, as late as the beginning of the 12th/18th century trading ships from

the Volga still did not sail farther south than Nīzābād (Nizovaya), between Darband and Baku (Hanway, I, p. 9).

It was Peter the Great who provided the decisive impetus for Russian penetration in the Caspian. In 1719-20 the first navigational maps for the northern Caspian appeared, and in 1720 the Caspian hydrographic service initiated its systematic investigations. In 1722 a pilot service was established in the Volga delta, a new naval shipyard was opened at Astrakhan, and private individuals were granted the right to build commercial ships there. Finally, the occupation of Darband, Baku, and part of Gīlān between 1134/1722 and 1148/1735 provided the opportunity for Russian ship captains to become familiar with the southern parts of the sea and with the Persian coasts. Ships belonging to Russian and Armenian merchants thenceforward carried on regular trade with Gīlān. All this maritime activity seemed minor in the eyes of the British, who had once again entered into the Caspian trade; nevertheless, at the end of the 1140s/1730s there were at Astrakhan thirty-eight ships of 120-200 tons devoted to trade with Persia. Other Russian vessels carried on trade with the bay of Mangyshlak on the eastern coast. From that time on the Russians were the only navigators of any importance on the surface of the sea (Hanway, I, pp. 17, 106, 133).

Against this background in 1734 the British launched a grand new attempt to open maritime commerce across the Caspian, with the authorization of the tsarina Anna Ivanovna. British factors of the newly founded Russia Company were established in Gīlān, and active trade began in 1741. One of the British merchants, John Elton, following a disagreement with his partners, entered the service of Nāder Shah in 1155/1742 and was commissioned by the latter to build him a fleet. This undertaking was the last serious Persian effort to establish a navy on the Caspian (Hanway, passim; Curzon, 1892, II, pp. 390-92; Lockhart, 1938, passim). With the aid of Russian deserters, Elton undertook the task and built several ships, one of which was armed with twenty-three cannons. At the same time he and another Englishman, Captain Woodroofe, carried out a survey of the southeastern coast of the Caspian (Hanway, I, pp. 109ff., 124). These activities caused considerable disquiet in Moscow, and in 1746 the Russians prohibited further British trade on the Caspian; the factors in Gīlān were withdrawn once and for all (outline and summary in Hanway, I, pp. 433-36). The death of Nāder Shah in 1160/1747, then that of Elton himself, who was assassinated by rebels against the Afsharid dynasty in 1164/1751 (Hanway, II, p. 456), put an end to Persian ambitions in the Caspian. Russian supremacy was formally recognized after the occupation of the Transcaucasus; a clause in the Treaty of Golestān (1228/1813), which was renewed in the Treaty of Torkamāṇčāy in 1243/1828, granted to Russia the sole right to operate warships on the Caspian.

Russian domination (1828-ca. 1930; Nagdaliev; Guseĭnova). Thus opened the period of regular maritime service, beginning with that from Astrakhan to the lands of the Caucasus. In about 1840 approximately 240 transport ships were plying that section of the coast, still mainly under sail. In 1844 the steamship *Volga* was sent to explore the possibilities of navigation up the Kura, and in 1846 a steamship postal service was organized. The Caucasus and Mercury (Kavkaz i Merkuriĭ) Company was founded in 1858 to ship cargo on the Caspian, the Volga, the Oka, and the Kama, and in the same year regular east-west passenger service between Baku and Krasnovodsk was introduced. When petroleum from Azerbaijan began to be shipped via the Caspian at the end of the 1850s, a stable pattern of trade between that province and Russia

gradually developed. Construction of an artificial harbor was begun in 1859 at Baku; by the beginning of the 1860s the Caucasus and Mercury Company was already operating fifteen steamships and seven propeller schooners on the Caspian. Regular mercantile traffic circulated between Persia and Astrakhan, with ports of call in Azerbaijan. The staple commodities in this trade were petroleum, wood, and other construction materials.

Owing to the growth of merchant shipping the Caspian became a major arena for technological innovation. Petroleum and fuel oil, which at first were carried in wooden pinnaces, were rapidly shifted to metal ships. In 1878 the first steam tanker appeared on the Caspian, the 250-ton *Zoroaster*, which had been built in the shipyards at Stettin. In 1882 the first tanker was constructed in Finland for the Caspian trade, and in 1897 the first two-propeller ship was introduced there. The first riverboat with an internal-combustion engine, the tanker *Bandal*, sailed into the Caspian in 1903 and was soon followed by the larger (1,000 tons) and more advanced *Sarmat*. In 1909 the first seagoing vessels with diesel engines, the tankers *Emmanuel Nobel* and *Khagelin Nobel*, of 4,600 tons each, were put into service. All these advances can be explained by the increasingly important role of the petroleum trade in Russian economic life. In some years at the end of the 19th century the volume shipped by sea reached 6 million tons, that is, 80 percent of the oil produced; the remaining 20 percent was shipped by rail. In 1899 there were 345 transport vessels devoted to petroleum shipping on the Caspian, 133 of them steamships. A law in 1904 had prescribed the replacement of wooden ships with metal ones, and by 1907 the tanker fleet had increased to 136 steamships with a total capacity of 142,000 tons, supplemented by about 160 sailing ships, with a total capacity of 50,000 tons. In 1912 there were 212 fuel-driven vessels, thirteen of them with diesel engines. These oil tankers were, however, only one component of a considerable and varied fleet, which already in 1878 had been estimated at 790 steamships and 1,200-1,500 sailing ships (Curzon, pp. 300-01). The capacity of the fleet had reached 260,000 tons by 1920, when it was nationalized by the new socialist regime under the name UPROMTRAN, changed in 1922 to GOKASP, in 1930 to SOVTORGFLOT KASPIA, and in 1934 to KASPAR. After 1931 it included 10,000-ton tankers constructed at Gorki and after 1936 large passenger ships like the *Turkmenistan* and *Dagestan*.

This development of Russian navigation had gradually stifled all serious trans-Caspian maritime activity on the southern coast, with the notable exception of that of the Turkman (see below). In 1237/1822 travelers could witness a 150-ton ship being built at Anzalī and another, of 60 tons, in the neighboring village of Qāżīān, though both were of fairly primitive construction (Fraser, pp. 170-71). But by the end of the century the Gīlānis and Māzandarānis were no longer sailing, except on the lagoons (*mordāb*) and in the immediate coastal waters (Bazin and Bromberger, p. 92).

Russian domination on the expanses of the Caspian was accompanied by an almost complete takeover of the fishing industry, including that on the southern coast. In the 11th/17th century commercial fishing had been carried on by Persians. In 1047/1637, according to Olearius (p. 235), "the Sofi [Shah ʿAbbās II] farmed out the fishing rights along the banks of streams near their mouths" from September to April. Fishing was free for the rest of the year. In the reign of Moḥammad Shah Qājār (1250-64/1834-48) fishing rights along the entire Caspian littoral were granted to a Russian subject named ʿAbdal, probably an Azerbaijani. Furthermore, during the first half of the 19th century two Russian freighters came in February every year to load large

quantities of fish, mainly sturgeon, at the mouth of the Safīdrūd (Trézel, p. 115), and Russian fishermen could be seen here and there along the entire coast (Aucher-Eloy, p. 411; Chodzko, p. 74). No doubt religious factors contributed significantly to the ease of this Russian takeover. The progressive loss of Persian interest in fish probably can be considered a manifestation of the increasing rigor of Islamic observance in the Safavid period; in particular, sturgeon, a fish without scales, was forbidden (*ḥarām*). But Russian domination of commercial fishing was also the obvious result of absolute Russian supremacy over the entire expanse of the Caspian Sea. The fishing concession continued to be granted to Russian subjects throughout the remainder of the 13th/19th century and until the outbreak of World War I. After the Revolution in 1917 the Soviet government itself exploited the fisheries from 1922 to 1927, in exchange for payments to the Persian government; a joint Soviet-Persian company was established in 1307 Š./1928, and finally in 1322 Š./1953 fishing rights in Persian waters were returned to the Persian government (Bazin, II, pp. 129-30). These long-term arrangements led to the installation on the Persian coast of a significant body of support personnel, composed of Russians from Astrakhan and Azerbaijanis from Baku. The fishermen themselves were mainly Azeris, both Russian and Persian subjects; men from Ḵalḵāl were especially numerous among the latter (Rabino, p. 32).

Turkman maritime culture. Despite this overwhelming Russian preponderance and Persian surrender of its interest in the Caspian, an original and independent Turkman maritime culture did develop on the southeastern shores of the sea. It was deeply rooted, for the Turks of lower Central Asia had been familiar with the sea and its riches since the medieval period. Already in the 4th/10th century they were pillaging ships wrecked on the Sīāhkūh (Mangyshlak) peninsula (Ebn Ḥawqal, tr. Kramers, II, p. 379). In 1558, near the mouth of the Ural, Jenkinson met a ship manned by thirty banished Turkman subjects who were seeking their fortunes as pirates (*Early Voyages*, p. 62). In the 12th/18th century the activity of such pirates reached a peak (Hanway, I, pp. 109-10, 112-16, 139, 277 et passim). Their principal haunts were located on the rocky coasts surrounding the bay of Balḵān (Krasnovodsk), on cape Čeleken, and in the neighboring islands (Dargān island, the Ogūrtjoy/Ogurchinskiĭ islands). Between raids the pirates lived from fishing (Hanway, I, pp. 113-14). In 1743 Captain Woodroofe counted twenty-eight boats in one place, fourteen in another, and seventeen in still another. Jonas Hanway met a group of seven barks, each with a crew of ten or twelve men. Usually about half the ships went raiding along the Gīlān, Māzandarān, and Gorgān coasts, while the other half remained in port to defend against reprisal attacks by the Persians. In fact, the various expeditions of Nāder Shah to the Turkman coast, including his construction of a fort dominating the bay of Balḵān (Hanway, I, p. 116), had little effect.

In the end it was the Russians who put an end to Turkmen piracy by establishing themselves on the islands of Āšūrāda in 1254/1838, near Krasnovodsk in 1869, and at Chikishlyer in 1871. The Turkmen then gradually turned to peaceful maritime pursuits. In 1835 they were already selling their fish products and the down from aquatic birds to the Russians (Aucher-Eloy, p. 355). In particular they soon acquired what amounted almost to a monopoly over trade along the Persian coasts (Bazin and Bromberger, pp. 90-93), which they carried on in a type of boat with a rounded bottom called *kerejī-e torkomānī*, also simply *naw*, measuring 25 x 4-5 m, with a capacity ranging up to 80 tons; it was fitted with a large triangular mainsail, a jib, and a square sail and usually required a crew of eight men. This Turkman coastal trade reached its peak at the beginning of the 14th/20th century. The main ports at that time were Gomīšān, where there was

still about forty of these ships in 1339/1920, and Bandar-e Šāh. The cargo traded along the coasts consisted of salt and cottonseed oil from the Turkman desert, which were exchanged for rice, wood, and hemp loaded at Anzalī. Similar, flat-bottomed *kerejīs* were used for offloading at small ports on the coast and at Pīr-Bāzār in the shallow Anzalī lagoon, where they numbered nearly 4,000. The Turkman also did not hesitate to take to the high seas, importing petroleum and sugar from Russia and exporting rice and charcoal from Gīlān.

The Turkman's special orientation toward the sea, in contrast to the maritime ineptitude of the Persians and other Iranians from the Caspian provinces, poses an interesting cultural problem, which has been clearly enunciated by Christian Bromberger (Bazin and Bromberger, p. 92). It probably reflects the demographic and social structures peculiar to the Turkman. Particularly the overpopulation of a subarid environment with limited resources must have prompted many poor men and those excluded from nomadic society to turn to the sea in search of an opportunity that the continent could not offer. Perhaps the mechanisms for transmitting pastoral property within Turkman society (high purchase price for brides, inheritance entirely reserved to the last male child; cf. Irons, 1975) also favored this tendency.

Contemporary economic activity.

The historic contrast between the overwhelming Russian presence and Persian indifference has not changed significantly in the present century and still dominates life around the Caspian, as well as its economic exploitation.

I. Shipping and transportation.

The Soviet sector (Nagdaliev; Voĭtolovskiĭ, pp. 126-29; Nikol'skiĭ, pp. 109-11). Since the integration of Central Asia into the highly diversified Russian industrial economy the geographic position of the Caspian has meant an intermediate role of growing importance, compensating to a considerable degree for the relative decline in shipments of petroleum from the Caucasian wells, which are becoming exhausted. Maritime traffic had already increased considerably during World War II, when transport of cargo via the Caspian, situated well behind the front, was greatly intensified. It was much more important in 1944 than it had been in 1940. Progress in opening up interior waterways (e.g., the Don-Volga canal in 1952) has further stimulated traffic on the Caspian, which has come more and more to function as an extension of those waterways. Some problems have arisen, however, as a result of declining water levels, which made it necessary to modify radically the composition of the Caspian fleet and to return to ships of shallower draft. In 1954 the first tankers of the *Oleg Koshevoĭ* type, drawing 4.3 m and with a capacity of 4,400 tons, were launched. The number of these ships increased in the 1960s; they are adapted both to river navigation and to the severe weather conditions on the open sea and thus permit continuous movement between the two environments without the necessity for transferring cargo. Finally, with the appearance of ferries like the *Sovietskiĭ Azerbaĭdzhan*, carrying both passengers and railroad cars, it became possible to ship cargo continuously by rail and sea, with the crossing from Baku to Krasnovodsk taking only ten to twelve hours. The cost of transporting a ton of cargo thus dropped sharply from 3.69 rubles from coast to coast in 1963 to 1.66 rubles in 1966. Between 1963 and 1971 these new ferries carried 23.4 million tons of cargo and 1,402,200 passengers.

Shipping on the Caspian continues to be dominated by petroleum products, which account for 50 million of a total of 65 million tons of cargo. The traditional production of the wells in the Transcaucasus has been augmented by that from the Kuĭbyshev and Bashkir regions, which is shipped to all ports of any importance and particularly to Central Asia. From Krasnovodsk masonry blocks (500,000 tons) and cotton are sent to the shipyards and textile factories of the lower Volga region and salt to the Transcaucasus. In return wood from the Caucasus is loaded at Baku for the ports of Krasnovodsk and Bekdash in Central Asia. Baku, Krasnovodsk, and Makhachkala together account for two thirds of the total Soviet shipping on the Caspian, followed by Gur'ev and Astrakhan. Passenger traffic averaged 700,000 people a year in the early 1980s; the most frequented routes were those between Astrakhan, Makhachkala, and Baku, on one hand, and Krasnovodsk, on the other.

Persian sector. In contrast to intensive and rapidly expanding Soviet shipping on the Caspian that of the Persians is negligible. Marine traffic to and from the Soviet Union, which remained active during the 1300s Š./1920, was subsequently reduced to almost nothing, owing first to political difficulties that gradually put an end to travel from Persia to Europe via the Soviet Union, then to completion of the Transiranian railway in 1317 Š./1938; the latter event led to the fundamental reorientation of Persia's foreign trade toward the southern coast. Since then Persian shipping on the Caspian has been limited in practice to less than 100,000 tons, mainly imports, at the port of Anzalī. The construction of a coast highway, combined with the gradual lowering of the sea level, which caused the silting up of a number of small harbors, caused a decline in the coastal maritime trade as well. After 1950 this trade was estimated at only about 600 tons a year, and it has now totally ceased. The last Turkman *kerejī*s have been decommissioned and are currently used as floating pontoons for fishing nets (Bazīn and Bromberger, p. 91).

II. Fishing (for the Caspian in general, see Bartz, pp. 505-26; Carré).

Soviet sector. The same Soviet predominance that has been described in connection with shipping can also be observed in commercial fishing, which nevertheless appears to be in decline, not only relative to the fishing industry in the Soviet Union as a whole, which is more and more dependent on ocean trawling, but also in absolute terms. The Russian catch in the Caspian was 640,000 tons in 1913; it fell to 350,000 tons in 1940, rose to 530,000 tons in 1970, but totaled only 380,000 tons in 1980. The Caspian furnishes no more than 7 per cent of the fish consumed in the Soviet Union, compared to 63 percent in 1913.

The composition of the Caspian catch, on the other hand, has changed profoundly in the course of the last half-century. The proportion of high-priced fish has continued to decline. The shad catch fell from 329,000 tons in 1913 to 55,000 tons in 1960; in 1985 it was less than 1,000 tons. For roach the figures were 142,000 tons in 1913, 60,000 tons in 1960, and 5,000 tons in 1980. The sturgeon catch has diminished less but nevertheless fell from 28,000 tons in 1913 to 21,000 tons in 1985. On the other hand, the catch of *kil'ka*, an oceanic species of little value that was hardly fished at all before World War I, has risen from 21,000 tons in 1950 to 304,000 tons in 1980 (more than 80 percent of the total catch) and to 269,000 tons in 1985. Fishing has thus been largely displaced toward the high seas in the central and southern basins. It has been estimated that in 1930 80 percent of the catch came from the northern sector of the sea, versus 20 percent from the central and southern sectors; in 1968 the proportions were almost exactly the reverse,

78 percent from the center and south, 22 percent from the north. Nevertheless, owing largely to inertia, most of the catch continues to be unloaded in the ports of the Volga delta, especially Astrakhan, which still receives more than half the total. The Ural sector accounts for 13 percent, Azerbaijan and Dagestan for a quarter, Turkmenistan for only 10 percent.

The changes in the composition of the catch have had profound repercussions on fishing methods, as well as on related social organization. Coastal and river fishing beds, where the valuable species predominate, are fished from ships of light tonnage or sometimes from boats but primarily by means of beach nets. Much of this activity is seasonal and still gives rise to substantial migrations of Kirghiz and Kalmuck fishermen. The catch from a widespread area, which no longer accounts for more than 20 percent of the total, is concentrated especially in the Volga delta, where the flesh is salted and the roe processed into caviar. On the other hand, the general commercial fishing industry, which is far more important today, relies on methods of pump fishing, from refrigerator ships that have continually increased in size. In the 1960s the dominant type was the 1 ,650-ton ship manned by thirty-two men. Since 1960 seagoing factories like the *Dnepr*, built in Poland, have appeared; each has a capacity of 14,000 tons, requires a crew of 360 men, and can process approximately 60-70 tons of *kil'ka* a day into fish meal and oil. In 1970 there was already a total of eighty refrigerator ships of all types, in addition to 150 smaller boats, each manned by five to ten men, which worked as satellites to factory ships or delivered directly to processing plants on shore.

This contrast in the techniques of fishing is partly, though not entirely, mirrored by a fundamental social difference in the systems of property ownership. Fishing kolkhozes still play a significant role, accounting for 43 percent (i.e., 230,000 tons) of the total Soviet catch in 1970. They concentrate particularly on the high-priced species but also fish for *kil'ka* from seining ships. Oceanic fish furnished 56 percent by weight of the kolkhoz catch, a far higher proportion than those of ordinary fish (22 percent) and sturgeon (7 percent). The magnitude of these cooperative ventures has gradually increased. The number of fishing kolkhozes declined from 205 in 1950 to 143 in 1960 and 74 in 1970, with around 8,000 member fishermen. Productivity remained low (twenty-nine tons a year per fisherman, 3,100 tons per cooperative), with important exceptions. It is highest in the kolkhozes located around Astrakhan. As for the state companies, they fish almost exclusively for *kil'ka*. The general management is located at Astrakhan, and the number of fishermen employed in 1970 was around 7,000, producing about 300,000 tons.

Persian sector (Bazin, II, pp. 129-39; Brandt; Herzog; Rostami; *Šīlāt*; Somerville-Large, pp. 41-50; Vieille and Nabavi; Vladykov). The Persian catch seems extremely small in comparison to that of Soviet fishermen. It averaged a little over 4,000 tons a year between 1359 Š./1980 and 1364 Š./1985, a decline of about 50 percent from that of the prerevolutionary period (7,000-8,000 tons) and less than 1 percent of the total catch from the Caspian. It is nevertheless far from negligible, for Persian fishing is largely oriented toward the most valued species, the sturgeons, which constitute a very important proportion of the catch, an average of ca. 1,500 tons in 1359-63 Š./1980-85. Although it might have been feared that the new regime would prohibit sturgeon fishing, the catch has diminished hardly at all since the Islamic revolution. The problem involved the legitimacy in an Islamic society of permitting handling and selling of a product that is *ḥarām* but that nevertheless provides an appreciable source of foreign exchange. A press campaign

succeeded in bringing to an end an earlier prohibition, which during the 13th/19th and the first half of the 14th/20th century had permitted the Russians to enjoy a monopoly of the manufacture and sale of Persian caviar. In 1361 Š./1983 a decree (*fatwā*) by Ayatollah Khomeini lifted the ban, declaring sturgeon and caviar legal (*ḥalāl*; Bromberger, 1984). Unlike the Soviets the Persians permit sturgeon fishing in the deep waters of the Caspian. It is conducted from forty-nine permanent stations (*ṣaydgāh*), established mainly near river mouths. Line fishing from small boats, each manned by a crew of four, is the most common method; the boats are simply drawn up on the sand when they return. There are two seasons, one from February to June (especially for sevruga) and one from August to October (for *fīl-māhī* and *tās-māhī*). The fisheries are most numerous around the Safīdrūd delta and farther east around the Bābolsar. There is also a sturgeon farm near Sangar (in the Safīdrūd delta). Approximately 10 percent of the total sturgeon catch in the Caspian, and the concomitant production of caviar, comes from the Persian sector.

On the other hand, the Persian catch of other species is almost negligible and has diminished still further since the revolution. It averaged less than 3,000 tons a year between 1359 Š./1980 and 1364 Š./1985. The main species involved are the *Mugilidae* (mullets, Pers. *kefāl*), which account for two thirds of the 3,000 tons, and roach, which are caught near the coast and around the mouths of the rivers by means of large rowboats and beach nets during the cold season. Fishing for *kil'ka* on the open sea, which was resumed in the decade between 1349 Š./1970 and 1359 Š./1980, yielding 1,000 tons in 1357 Š./1978, has practically disappeared since the revolution.

The Persian fishing industry was completely nationalized in 1332 Š./1953, when the concession to the joint Persian-Soviet company expired. It was placed under the control of a state company, *Šerkat-e Sahāmī-e Šīlāt-e Īrān* (Anonymous company for Iranian fishing). Rights to fish for scaly fish, however, were for the most part farmed out to private entrepreneurs or fishing cooperatives (Šerkat-e Taʿāwonī-e Ṣayyādī) located along the coastline. The middle managers and lower-ranking administrative personnel, as well as the permanent employees, of the state company were mainly drawn from descendants of the first groups of *mohājer*s (immigrants) who had migrated from the Russian Caucasus at the end of the last century and at Anzalī are perceived as a distinct ethnic group, the *šelātī* (people of the fisheries). The great majority of fishermen are Azeris, temporary migrants especially from the city of Ardabīl and neighboring villages and from a group of about a dozen villages west of Harowābād (Bazin, II, p. 138); most of the rest are *mohājer*s. Only a very small number are Gīlak or Ṭāleš from the fishing zones along the rivers. Recently, however, the latter have increased in numbers, and one group of several dozen individuals has moved to Māzandarān and founded a fishing cooperative (Bazin, II, p. 139).

Problems of biological equilibrium and preservation of the environment (Marti et al.; Carré, pp. 10-13; Belyaeva et al.). The decline in the yield from the fisheries and the changes noted in the nature of the catch reflect serious shifts in the biological equilibrium of the Caspian area and the degradation of the marine environment. The drop in sea level, which lasted almost half a century, from the 1310s Š./1930s to the recent reverse in the trend, primarily reflected the drying up of the basin but also multiplication of development projects on the tributary rivers (construction of reservoir dams, increased facilities for irrigation). These changes in turn had numerous and important biological consequences: reduction in the nutritional yields from the sea, which consist primarily of the varied fauna; drying up of the spawning grounds and feeding zones for fish in

the northern basin, which had been biologically the richest; increased salinity, which is harmful to the eggs and larvae of stenohaline species; difficulties for anadromous fish in finding access to watercourses; and variations in water temperatures, with the low of 2° C in May and June rising 3-5° C in October and November, linked to the rising waters in the reservoirs and the annual opening of the dams. It has been possible to quantity the effects of the great reservoir dams at Kuĭbyshev and Volgograd, which cause the loss of 165,000 tons of fish a year. The biomass in the northern basin of the sea is said to have dropped by 30 percent from that in the period 1948-55, before the dams were completed. The effects of pollution should be added as well, especially pollution resulting from underwater petroleum drilling; furthermore, the use of explosives in prospecting for hydrocarbons was fatal to a large number of fish in the 1960s. One particularly significant example of the degradation of the environment is the overhunting of seals; as they are located at the top of the food chain, their numbers can be taken as an index of the overall richness of the environment. The annual catch, which was 115,000 head during the period 1867-1915 and 160,000 during the years 1935-40, fell to 60,000 in the years 1941-50.

These considerations must, however, be assessed in relative terms. As far as fish are concerned, it is estimated that the total catch could reach as high as 500,000-600,000 tons a year if the present balance of the stock were maintained, and at present such quantities are not even sought. The problem arises almost exclusively in connection with the higher-priced fish and those of large size. In order to halt the decline in the numbers of these species, the Soviets adopted a policy of conservation and enrichment of the environment at a very early date. This policy was implemented in a variety of ways. One measure was the introduction of new species into the Caspian: river turbot (*Pleuronectes flesus luscus*, introduced in 1930-31), which has not developed any economic significance, and especially two species of mullet from the Black Sea, *Mugil auratus* and *Mugil saliens*, which have succeeded very well. The principal efforts, however, have been directed at the sturgeons, by far the most valuable species. Fishing on the open sea was forbidden in the northern sector in 1940, and the ban on Soviet fishing was extended to the entire Caspian area in 1962. Pisciculture was also developed. On 1 January 1972 470 million young sturgeon were released into the Caspian, which explains the rise in the catch from 9,500 tons in 1960 to 23,000 tons in 1975. But these efforts at artificially increasing and improving the population have benefited mainly the fishermen in the northern part of the sea, altering the regional proportions of the catch; for example, in the Volga sector the proportion of the total Caspian sturgeon catch rose from 35 to 64 percent between 1931-35 and 1971. Efforts to preserve and increase the seal population have been less successful. Despite governmental measures to protect the breeding areas, particularly the island refuges, the catch remained fairly low in the 1950s and 1960s, surpassing 75,000 head only in isolated years. In 1967 the Soviet government decided to ban hunting of adult seals and in 1970 to limit the catch of young seals to 40,000 head a year, in order to raise the population to 500,000-600,000 head, including 100,000 reproductive females (Kasymov, p. 122). In 1975, however, the catch rose to 51,400, and in 1980 hunting was limited once again, to a maximum of 50,000 head. The actual catch since that period has in fact been between 20,000 and 35,000 head a year, and in 1985 the total population was estimated at only 450,000 head, which was, at most, half the natural population at the end of the 19th century.

This policy of protecting the environment has so far been applied primarily on the Soviet coast. A bilateral agreement to prevent pollution, which was signed by Persia and the U.S.S.R. in

December 1975, has remained largely on paper. Basically the maintenance and exploitation of the biological resources of the Caspian pose a potential problem in political geography: Although at present the exploitation of the sea remains extremely slight on the Persian side, every Persian attempt to harvest a greater share of the resources means conflict with the Soviet Union, which is already exploiting the environment to the acceptable limit. Furthermore, it will be very difficult indeed to specify a precise division of scarce supplies of the profitable species between the two parties.

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