

indicating a progressive diminution of size. A continuous decrease from the larger Pliocene to the diminishing Quaternary area is inferred by this observer and explained by drying winds and by uplift of the eastern part of the plain, where the surface is now 2,000 feet above sea-level. Obruchef also describes the Quaternary Aralo-Caspian as the direct successor of the Pliocene sea, the decrease of area being ascribed to uplift on the east (1890, 25). Neither of these observers gives explicit recognition to the idea that the Quaternary sea resulted from the expansion of a smaller early-Quaternary sea, to which the waters had shrunk from their great Pliocene extension.

The Aralo-Caspian is marked by Konshin, in the article just referred to, as reaching, at the beginning of the Quaternary, eastward to the present ends of the Murg-ab and Tejen rivers, and southward to the base of the mountains at Kizil-Arvat; farther west it connected with the Caspian basin by the Balkhan gateway; to the northwest it spread beyond the present Aral; to the northeast it had a well-defined boundary south of the Amu River. Here a higher northeastern part of the Kara-Kum, underlaid by Pliocene and older strata, breaks off in a dissected, south-facing escarpment, the Ungus, which Obruchef ascribes to a fault (1890, 250), and along the base of which Konshin describes shorelines (1887, 238), probably contemporaneous with those at Krasnovodsk and Jebel. The floor of the depression south of the Ungus is stated by Lessar to be 44.6 meters below the Caspian (1889, 714). This escarpment and the shorelines along its base are features toward which future observation might well be directed, with the hope of deciphering the history of the sea in greater detail. If I understand Konshin's description, the dissection of the Pliocene strata in the escarpment must have taken place before the shorelines were made at its base. It might, therefore, here be possible to recognize the time interval that observations elsewhere lead us to suppose elapsed between extensions of the Pliocene and the Quaternary Aralo-Caspian Sea, and perhaps to decipher the presumably complicated history of the Quaternary sea itself.

In the late Quaternary, the sea was reduced to lower and lower levels, and the Caspian and the Aral were thus separated, except for a water passage or channel, the Usboi, which passes along the southeastern base of the Ust-urt and through the Balkhan gateway. There has been much discussion regarding the nature and origin of this channel. As it has the form of a river channel, and as the Amu is the only large river in the region, the Usboi has been repeatedly said to be the former course of the Amu. For example, Sievers (1873) describes the Usboi as a channel so well preserved that it seems to have been only lately abandoned; it is about 65 feet deep, two-thirds of a mile wide, eroded in the unconsolidated deposits of the steppe or in the firmer Miocene beds on the border of the Ust-urt. The channel has many bends; it often divides, so as to include islands, but there are no branch channels entering it. Other observers have noted that the gentle southwestward descent of the channel is broken by the sills of rapids at several points, from which it may be inferred that the stream by which the channel was eroded did not endure long. The Amu being a large river not far distant, its former connection with the Usboi seems to have been assumed without waiting to trace an actual connection between