INTRODUCTION

During the latest geological period, water exchange between the Caspian and Black seas occurred repeatedly (more often in the Pontic direction). The last such event occurred at the very end of the Late Pleistocene during the Khvalynian transgression of the Caspian Sea. K. Pallas was the first who called attention to this event; N.Ya. Danilevskii substantiated it, having found the joint presence of the Black-Sea and Caspian mollusks in cross-sections of the Manych.

Among numerous investigations on the problem under consideration, the most significant are those of G.I. Gorodetskii [8] and G.I. Popov [18], who elaborated a detailed stratification of sediments in the Manych, and K.K. Kvasov [10] who made a set of hydrologic computations. Interesting information on the Manych is given in [13, 19, 23]. These studies, as well as publications on the Azov–Black Sea [2, 4, 7, 9, 17, 21, 24] and Caspian [3, 12, 19, 20, 22] basins contain comprehensive considerations of the history of these water bodies and the description of bottom deposits (BD) and the paleontologic fossils in them. However, information on the chronology and interrelation of these basins is very contradictory. The prevailing opinion is that the Khvalynian transgression of the Caspian Sea coincided in time with the Surozhian (Tarkhankutian) transgression of the Black Sea, which was distinguished by G.I. Popov [18] within the Post–Karangatian epoch of the Pontic basin. Numerous facts collected by now allow us to reconsider the interrelation between the ancient Pontic–Caspian basins and the effect of the Khvalynian transgression water discharge through the Manych on the Black Sea’s level and salinity.

CHRONOLOGY AND CORRELATION OF THE LEVEL REGIMES OF THE CASPIAN AND BLACK SEAS OVER THE LAST 18 THOUSAND YEARS

There are numerous radiocarbon datings of bottom deposits in the Caspian and Black seas, which allow one to reconstruct in detail the variations in sea levels and perform justified correlations. There are 250 dates for the Caspian Sea. About 150 out of them are for the sediments in coastal zones, which fixed the transgression state of the sea. These dates form three large clusters (0–6.5, 7.0–9.5, and 11.0–16.0 thousand years) on the time scale (Fig. 1), which correspond to the New-Caspian, Late-Khvalynian, and Early Khvalynian transgressions of the Caspian Sea. These clusters, in their turn, consist of smaller groups divided by the time intervals for which paleo-dates are not available and which correspond to the epochs of sea regressions. The groups within the intervals of 2.5–2.9, 3.9–5.0, 6.5–7.2, and 9.5–11.0 thousand years are most clearly defined.

The paleohydrologic belonging and the stratigraphic position of the mentioned intervals are well ascertained by the composition of fossil shells of index mollusks. Within an interval of 11–16 thousand years, the dated sediments contain the Early Khvalynian complex of mollusks: Didea crassula and D. baery. It was evidently the initial phase of the New-Caspian transgression (the Gousanian one,
During the period of 7.5–9.0 thousand years ago, the Late-Khvalynian transgression was developing in several stages, with a level rise up to +50 m abs. This was the final period of the Great Khvalynian transgression, which was divided from the maximum stage by the deep (about −50 m) Enotaevian regression and from the succeeding New-Caspian transgression (0–6.0 thousand years ago) by the Mangyshlakian regression, with the level drop below −40 m. The whole New-Caspian transgression falls within the large-scale Post-Khvalynian regression of the Caspian Sea whose level did not rise above −20 m over the last 7 thousand years.

The comparative analysis of variations in the levels of the Caspian and Azov–Black Sea basins over the last 18 thousand years shows the different degree of similarity of these variations in different periods (Fig. 1). The epoch of 18–10 thousand years ago was characterized by a high similarity of variations in the levels of the two basins. At the beginning of this epoch (~18–16), the position of levels was low, which coincided with the end of the Post-Karangatian regression of the Black Sea (the level is below −80 m abs.) and the Atelian regression of the Caspian Sea (the level is below −40 m abs.). Then (16–11 thousand years ago) the levels were rising unevenly (by the rate and amplitude) over a prolonged period, which coincided with the Early Khvalynian transgression of the Caspian Sea and the Enikalien and New-Euxinian stages of the Black Sea. The succeeding (about 10 thousand years ago) drop in the levels of these basins is due to the Enoetaevian regression of the Caspian Sea and the Pre-Bugazian regression of the Black Sea. This similarity of the level behavior in the Pontic-Caspian basins during the period of 18–10 thousand years ago may be explained by their close interaction which determined the similarity of paleohydrologic events.

During the epoch of 10–7 thousand years ago, the levels of the Caspian and Black seas varied either similarly or oppositely (Fig. 1). The epoch of 7–0 thousand years ago is the period of the opposite course of level variations in the two basins. The Caspian level was unevenly dropping from 0 m to −50 m, sometimes abruptly rising (up to −20 m) during the phases and oscillations of the New-Caspian transgression. The level of the Black Sea was interruptedly rising (the Flandrian transgression) up to 0 m or higher. The mentioned dissimilarity is associated with the different causes of level variations in the two basins. The Flandrian transgression was caused by the penetration of the Mediterranean water, whereas the New-Caspian...