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The conference is devoted to the memory of Andrey Dodonov – geologist, colleague, friend and teacher

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The book presents the materials of the International Conference held in Rostov-on-Don (Rostov Region, Russia). Reports concern a wide spectrum of issues connected to the study of Quaternary marine and continental deposits of Eastern and Western Europe, Asia, and Africa. Paleobiological record of the Eastern Europe, faunal connections with Asia, Africa, and Western Europe are considered. The special attention is given to questions of paleogeography, climatic changes in the Quaternary, stratigraphy and sedimentology of Eastern Europe. Also presented are the newest data on the tectonics and climatic record. Questions of distribution and chronology of Paleolithic sites, adaptations of the ancient people to paleoenvironment are discussed.

Addressed to geologists, stratigraphers, paleontologists, paleogeographers, and archaeologists.

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THE SPECIFIC FEATURES OF SEDIMENTATION ON THE SHELF OF THE SOUTHERN SEAS (THE SEA OF AZOV BEING EXEMPLIFIED)

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The study of relief formation and sedimentogenesis processes of the seas of the South of Russia is the most important theoretical and applied task of geomorphology and marine geology. Many issues of sedimentation on the shelf of inland seas, genesis, and development of relief forms, and paleogeography remain to be unsolved. To give answers to the nowadays questions the seas' studying faces is possible basing on the results of complex marine and terrestrial researches. But classical methods, applied to geomorphology and marine geology, should be supplemented and correlated with the results of biostratigraphic research. Since the mid 1990s, such researches have been carried out by SSC RAS. Vast actual material on the Sea of Azov, the Russian part of the Black Sea, and the water area of the Northern Caspian Sea has been accumulated and generalized for the period.

Pre-Holocene history of geological development of these seas, in many aspects, is similar and rather often intersects. Their common long-term development within the limits of one marine basin, alternation of transgress-regressive phases contributed to numerous biological invasions and frequent changes of hydrological and hydro-chemical conditions. During Holocene, separation of marine basins within the framework of current boundaries took place and limited connection with the World Ocean predetermined its own history of development for each water basin.

Underwater landscape studies, including such works as continuous echolocation and seismic profiling, and ground surveys, resulted in obtaining new data on the bottom relief composition, sedimentation conditions and velocity in the Late Holocene. The major part of research was concentrated in the Sea of Azov water area, where the cores of bottom sediments (up to 2 meters) and ground samples from the surface horizon were taken. The preserved shell material and carried out palynologic and diatoms analyses indicate that the sediments are of the Late Holocene age (the New Azov Layers). The results of seismic-acoustic survey and absolute age determinations of bottom sediments, sampled in different areas of the sea from ground cores, confirm biostratigraphic research data (Matishov, 2007; Matishov et al., 2007, 2009).

New ideas of bottom relief composition and genesis, paleogeographic situations of sedimentation and climate changes in the Late Holocene, as well as distribution of recent bottom sediments and related zoo-benthos biocenoses in the Sea of Azov, became the results of analysis and generalization of collected research material (Matishov, 2006, 2007; Matishov et al., 2008, 2009).

The current relief of the Sea of Azov formed during the Holocene as the result of complicated interrelation of endogenous and exogenous processes. In that time the linear accumulative forms of relief (spits), numerous underwater sand-shell ridges

caused by wind drifts, and erosive flat hollows of the bottom were formed. Among flat forms of relief, occupying the larger part of water area, abrasive and abrasive-accumulative terraces (located at the depth of 4-9 m.) and accumulative plains linked to the maximum bathymetric points of the sea bottom are specified (Matishov, 2006, 2007). The accumulative plains' morphology is complicated by the system of ancient valleys of paleorivers, with the biggest one being the valley of Paleo-Don (Shnyukov et al., 1974; Matishov, 2006). The outlines of paleorivers' valleys in the bottom relief are smoothed by the covering thickness of marine sediments formed in the Early-Azov and the New-Azov stages of the sea development.

Differentiated character of tectonic movements within the borders of marine basin determined the conditions and rates of sedimentation, as well as morphology and development of relief (Khrustalyev, Shcherbakov, 1974). Frequent changes of the sea level, which took place during the New-Azov stage of the sea development, predetermined the rhythmic character of sedimentary mass composition. The terrigenous sediments, which are, basically, clay and aleurite-clay silts, prevail in the central part of the sea in the studied transects. The larger types of sediments (fine-aleurite silts and fine-grained sands) are registered in the ground cores sampled along the periphery of marine basin, not far away from the coast and situated locally. Carbonaceous sediments are shells and products of its destruction (organic-detritus sand). The presence of heavily carbonaceous (shell) silts and silted shells over the total bottom area of horizons is typical of the sediment mass transect. The mass and quantity of interlayers enriched with shell material generally increase in the cores sampled closer to the coast with the sea depth decreasing. Obviously, it relates to the increase of biomass of bottom organisms from the areas with the distribution of clay silts to the areas covered by more coarse-grained sediments and general cross transport of bottom-bed loads, directed from the centre of the sea to its coastal area.

According to species composition of zoobenthos sampled from different horizons of ground cores, we can say that the composition of bottom sediments in the Sea of Azov, as well as salinity, in the Late Holocene was one of the main limiting factors influencing the distribution of bottom biocenoses (Matishov et al., 2008). In the total sedimentation balance, the role of terrigenous material formed in the result of coast and bottom abrasion with the general lift of the eustatic sea level increased. Because of the lithological composition of rocks experiencing destruction, mainly fine aleurite-clay material entered the water area, which distributed over the bottom under the influence of rough waves and currents. The major part of that clastic material deposited in the central part of the sea within the borders of a broad accumulative plain. The average velocity of sedimentation in the New-Azov period was 2 mm/year, reaching the maximum of 10 mm/year during the Nymphean transgression. Sedimentation rates in the part of accumulative plain close to the Temryuk Bay were 0.2-6 mm/year. The abrasion of the coasts and the outflow volume of the Kuban River loads, apparently, conditioned such a regime. In some cases, depending on geomorphologic situation and closeness to the coastal bluffs, the speed of accumulation reached 4-6 mm/year (Matishov et al., 2009).

Spore-pollen analysis of ground cores of the Sea of Azov bottom sediments showed the increase of pollen quantity of wooden plants in the lower horizons of the cores, indicating that during the accumulation period of the sediments (~1300–1800 years ago) the climate on the sea coast was less arid if compared to the current one. Arborescent pollen is mainly of pine and birch, the decrease of the role of the broad-

leaved trees' pollen has been registered. The presence of xerophyte and halophyte types of pollen of Chenopodiaceae is the evidence of climate aridification during the formation of the upper part of the New-Azov sediments (Matishov et al., 2007).

The results of diatomaceous analysis of the bottom sediments indicated that only upper (up to 20–35 cm) layers of sediments are characterized by great species diversity (more than 70 species) and contain shells of diatomaceous algae dominating in the recent plankton of the Sea of Azov (Matishov et al., 2007). Species composition of the mass species differs according to the area of the core sampling. Regardless of the area of the sea, the species composition of diatomaceous in the lower layers of sediments has become very poor. Taking into account the ecology of the registered species, one may assume that during accumulation of the indicated sediments' layers (~1500–1900 years ago) the water body was shallower when compared to the nowadays Sea of Azov (Matishov et al., 2009). Thus, by the methods of absolute geochronology and litho-biostratigraphy, it has been determined that 2-meter sediment cover and the recent bottom relief of the Sea of Azov were formed during the New-Azov period of the water body formation, i.e. during the last 2000 years, together with the recurrent stage of transgression under the conditions of intense denudation-accumulative regime. Tectonic regime of the adjacent areas and periodic alternations of climatic conditions, which, according to the results of biostratigraphic research, were of regular and frequent nature, influenced the relief formation processes that time significantly.

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