

THE BRONZE AGE IRRIGATION FACTOR IN THE DEVELOPMENT OF URBANISM IN MIDDLE ASIA AS SEEN FROM THE MURGHAB DELTA

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Ever since the beginning of the 20th century when the Anau Civilization was discovered by Raphael Pumpelly on the Kopet-Dagh piedmont plains of southern Turkmenistan, the discontinuities of urbanism in Middle Asia have been related to the erratic water supplies. The rivers, as the Murghab in southern Turkmenistan, discharge their waters in large delta fans after crossing the desert encased in steep corridors that separate the upper from the lower sections of their course. The great centers in Middle Asia received their water from rivers draining the glaciers of distant mountains, often well outside any direct political control.

Thanks to the recent intensification of archaeological work throughout the region, on the basis of the combined support of digital archive data from GIS and the analysis of satellite imagery, we are trying to relate the development of urbanism in the Bronze Age to the innovations in water management. The evidence, gathered over the past twenty-years in our survey and other parallel projects in the Murghab delta, indicates quite clearly the differences between the failed protourbanism of the Early Bronze Age and the successful one in the Iron Age. The building of an artificial irrigation system required the organisation of human labour, related to high levels of political and social complexity and the river water exploitation was no-artificial process till Achaemenid period, characterized by the construction of the main dams along the main streams of Murghab, as Great Band and Sultan Band. These structures were certainly supported by a central power, very well organized and capable to face the incessant problem of river regression, allowing the economical sources to erect and to maintain these public structures, of course entailing a great human energy employment.

During the Middle Bronze Age (2400-2100 BC) the settlements are homogeneously distributed across the entire territory of the delta. Thanks to the efforts of V.I. Sarianidi and his team, we can understand the birth and the development

of the main centre of this period in connection with the relative environment. Gonur North is a clear example of a large proto-urban centre (35 ha.), very close to the settlements situated along the piedmont area. During the Bronze Age the territory of the delta wasn't uncovered by sand and supplied by river water for the agricultural exploitation. The settlement system depended not only on the environmental situation, but mainly on the human influence. The Thiessen polygon application demonstrates that during the Middle Bronze Age the settlement system was hierarchically organized with Gonur North in the centre, concentrating the administrative functions as testified by the presence of the impressive palace. Anyway the administrative activity was shared out across a coherent series of second size sites, controlling the territory around. Unfortunately the attempt of the urbanization, following the foundation of the main Middle Bronze Age site of Gonur North, failed because of unfavourable natural and river supplying conditions.

On the basis of archaeological topography and detailed landscape analysis by using satellite and aerial photos, useful instruments for the present research, we tried to reconstruct the Middle Bronze Age environment and the relative irrigation system.

GONUR POPULATION ACCORDING THE ANTHROPOLOGICAL DATA

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The anthropological data, describing human physical features is the unique indicator of migrations in all epoch of existence of mankind. People moved to many periods of history on extensive spaces. The Neolith and Bronze Age take a special place in processes of formation of the population. The important information about this time, including anthropological one, we receive from the territory of the Near East, Middle and Southern Asia. This region is well enough presented by anthropological finds from the IV-II Millennium BC. (Trofimova, Ginzburg, 1972; Khojaiov, 1980; Kijatkina, 1987; Hemphill, 1998; etc.). In the same time the capital settlement of Margiana Gonur-Depe, which is dug out within last 35 years by Margiana archaeological expedition under direction of V.I. Sarianidi essentially supplements these data since represents the population lived per 2300-1600 BC in ancient delta of Murghab river — nowadays deserted areas of Kara Kum (Sarianidi, 1990, 2002, 2004, 2005, and others). Stratigraphic evidence and radiocarbon dates show presence of three periods inside of one cultural horizon. The first period last since time of the basis of a complex (last centuries of the Third — middle of the Second Millennium BC) up to the big fire which has destroyed all central part of the Kremlin (1800-1700 BC). The second period proceeded about 200 years after the big fire. The third period (about