

MODELING ANCIENT SETTLEMENT SYSTEMS (MASS)

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This year (2005/2006) marked the fourth year of the Oriental Institute's Modeling Ancient Settlement Systems (MASS) project. In collaboration with Argonne National Laboratory (ANL), members of the Oriental Institute use agent-based computer modeling to analyze the nature and development of settlements — and, ultimately, of states — in Bronze Age Mesopotamia. One specific goal of the project is to compare the rise and fall of states in northern and southern Mesopotamia as a function of their distinctive landscapes. To that end, our models incorporate the full range of social, economic, and ecological data available from texts, archaeological remains, satellite imagery, geomorphological analyses, and ethnographic studies. A final monograph, entitled *Modeling Mesopotamia: Exploring the Dynamics of Ancient Society*, will present the results of the project. MASS is funded by the “Biocomplexity in the Environment” program of the National Science Foundation.

The MASS Team

This past year saw several changes in the MASS team. Magnus Widell, an Assyriologist and the sole Research Associate on the project since its inception, left the project officially to replace Charles Jones as Head of the Oriental Institute Research Archives. Benjamin Studevent-Hickman, an Assyriologist and recent graduate from Harvard, replaced Widell in October 2005. In December 2006, the project hired a second research associate, Carrie Hritz, a specialist in remote sensing who had worked on the project for several years as a graduate student here in Chicago. In June 2006, she accepted a position in the Department of Anthropology at Washington University in St. Louis. Both she and Widell remain actively involved in the project.

Also, the MASS team is extremely pleased to announce the addition of Hermann Gasche of the University of Ghent. Gasche joined the project as a consultant in January 2006, bringing a wealth of expertise on the hydrological conditions of ancient Mesopotamia. We are very fortunate to have him.

As of June 2006, the members of the MASS team are as follows: Principal Investigators: Tony J. Wilkinson (Durham University); McGuire Gibson (Oriental Institute, University of Chicago); John Christiansen (Argonne National Laboratory). Senior Personnel: Scott Branting (Oriental Institute, University of Chicago); David Schloen (Oriental Institute, University of Chicago); Christopher Woods (Oriental Institute, University of Chicago). Computer Modeling: Mark Altaweel (Argonne National Laboratory). Research Associate: Benjamin Studevent-Hickman (Oriental Institute, University of Chicago). Graduate Students: Tate Paulette (University of Chicago). Consultant: Hermann Gasche (University of Ghent). Systems Manager: John Sanders (Oriental Insti-

tute, University of Chicago). Active Members: Carrie Hritz (Washington University in St. Louis); Jason Ur (Harvard University); Magnus Widell (Oriental Institute, University of Chicago)

Research Developments

Northern Mesopotamia: 2005/2006 saw major developments in the MASS team's modeling of the north. The target area was moved from the region of Tell Beydar to the region of Tell al-Hawa. This shift allowed the team to utilize the North Jazira Project, which provides considerable survey and soil data for the region. The shift also allowed the team to integrate data from the Tell Hamoukar area, which provides comparable data from a nearby region in Syria and a solid basis for the "interaction model." In general terms, the analyses of settlement interaction in the north includes such events as festivals, military conflicts, etc. To date the team has focused primarily on trade, particularly where nomadic groups are involved (some of our early results will appear in a forthcoming article by Altaweel and Paulette entitled "Modeling Nomad-Settlement Interactions: Investigating Economic Exchange between Nomads and Settlers Using Computer Modeling"). One advantage of the MASS trade model is that it is based on an opportunity-driven mechanism that can be imbedded in the social structures of settlements in the north and south alike.

Southern Mesopotamia: In 2005/2006 the MASS team began its modeling of the south. Based largely on Hritz's work, the target area was placed along an eastern branch of the Euphrates, near Nippur. Hritz and Widell defined the basic field systems of the area using satellite images and cuneiform sources. Studevent-Hickman provided a detailed report on the agricultural cycle and its labor requirements from cuneiform sources and anthropological studies. In addition, Studevent-Hickman and Widell compiled and presented data on transport in the region (given the "low-friction" environment of the canal systems, watercraft were their primary focus). An agricultural model for the south will be presented at the beginning of the 2006/2007 year.

General: The year also saw considerable progress in the MASS team's modeling framework for social and economic structure — both for the north and the south. Hritz and Studevent-Hickman compiled data bearing on the rise of leadership from anthropological studies and early cuneiform and iconographic sources. Studevent-Hickman also presented a rough draft of a chapter on the temple institution for the final monograph.

Presentations and Professional Talks

The list of talks given by the scholars involved with the MASS project would be far too long for this report. Together, several members of the team presented their work at the annual meeting of the British Association for Near Eastern Archaeologists (BANE), held in Edinburgh in January 2006. These talks formed part of a larger session that included papers by scholars at Reading University, who are also using computer modeling for their work in Jordan. Andrew Sherratt of the University of Sheffield brought the entire session to a resounding conclusion. Sadly, Sherratt died a few months later, but it was clear that he considered the MASS and Reading teams to be making major contributions to our understanding of human-environment interactions.

Work for the Coming Year

In 2006/2007 the MASS project enters its final year under the National Science Foundation grant. During this time the team will expand its interaction model to the south and refine its overall analysis based on model iterations and new research. A draft of the final monograph will be presented by August 2007.