Mark Altaweel, The imperial landscape of Ashur: settlement and land use in the Assyrian heartland. x + 165 pp., 23 plates with 70 annotated satellite photographs (in colour and black & white) and maps, graphs and diagrams (in black & white), 1 CD-ROM. Hardcover, linen, 29,7 × 21 cm. Heidelberg, Heidelberger Orientverlag, 2008 (= *Heidelberger Studien zum Alten Orient* 11). € 88,– / $ 135,–. ISBN 978-3-927552-44-9.

This is a revised and updated version of Mark Altaweel's 2004 PhD thesis at the University of Chicago. Researchers working on the Neo-Assyrian Empire, landscape archaeology or the archaeology of empires have already routinely made use of the original dissertation, submitted under the slightly different title "The land of Ashur: a study of landscape and settlement in the Assyrian heartland" and available from UMI Dissertation Publishing (www.proquest.com; order number AAT 3136466): a testament to the value of this first monographic study of the archaeological landscape of Northern Iraq in the early first millennium BC since David Oates' seminal work *Studies in the ancient history of northern Iraq* (1968, reprinted in 2006) which, following the analytical approach pioneered and popularised by his teacher and supervisor T. J. Wilkinson, used archaeological surveys and satellite images in order to investigate the structure and scale of the Neo-Assyrian Empire in its core region.

But Altaweel's 2004 PhD thesis has now been superseded by this significantly expanded new book. Due to his collaboration with Iraqi colleagues the author was able to use previously unpublished settlement data, and his reassessment of satellite imagery data has resulted in the detection of additional landscape features; the new data expands and strengthens the original analysis of the chapter on "Satellite imagery and data interpretation" (pp. 53-90, chapter 4). Moreover, Altaweel has used the opportunity to apply his recent research on agent-based computer simulation techniques in the entirely new chapter on "Socio-ecological modelling and landscape dynamics" (pp. 91-106, chapter 5). These two core chapters are framed by an introduction setting out the goals of the study (pp. 5-8), three chapters introducing the physical, archaeological and historical data, a comparative chapter contrasting the Assyrian heartland with other regions within the Neo-Assyrian Empire and the conclusions which highlight results and, especially commendable, shortcomings of the study (pp. 123-126). An index, a list of figures and a bibliography conclude the handsomely produced volume.

The first chapter on "The physical setting and key characteristics of empires" (pp. 9-21) briefly sketches the key principles of empire archaeology and presents basic information on the geography, geology, climate, flora and fauna of the landscape under investigation; this is specifically the area of roughly 150 by 70 km demarcated by Eski Mosul in the north, Jebel Qara Chauq and the river Khazir in the east, the Lower Zab in the south and Wadi Tharthar and Jebel Sheikh Ibrahim in the west (p. 6) – an area which contains the major cities of Assur, Nineveh, Kalḫu and Dur-Šarrukin but unfortunately not Arbela: from an historical point of view this is a pity as the textual sources from the mid-second millennium BC onwards clearly portray the triangle between Nineveh, Assur and Arbela as the Assyrian heartland. Chapter 2 on "Archaeology in the Assyrian heartland region" (pp. 23-35) provides a comprehensive and up-to-date summary of excavations and survey work including recent Iraqi research, arranged according to regions; this section can also be used as a handy bibliographical gazetteer. Unfortunately, the crucial data from the Iraqi surveys and rescue excavations around Nineveh and in the Makhul dam area conducted between 2000 and 2003 is not yet published and could not be used for the study (p. 63-64). Burhan Shakir Sulaiman's publication of the latter works has now been published (*Irakische Ausgrabungen im Maḫūl-Staudammgebiet, Heidelberger Studien zum Alten Orient* 12, 2010 [in Arabic]; a companion volume with an analysis by Peter Miglus and Simone Mühl is currently being prepared as *Heidelberger Studien zum Alten Orient* 13 [in German]) and the new data needs to be added to the materials collected by Altaweel. All relevant information is combined with data found in the Iraqi Atlas of Archaeological Sites (1976; discussed on p. 35) and presented in the form of two lengthy appendices, "Dated archaeological sites and historical locations" (Appendix 1, pp. 127-134) and "Iraqi Atlas of Archaeological Sites" (Appendix 2, pp. 134-135); the full versions of these and all other appendices can be found in the files on the CD-Rom which accompanies the book. Chapter 3 deals with "Historical data on the Heartland regions" (pp. 37-51), presenting some textual evidence on the historical geography in the same regional arrangement introduced in chapter 2 with a focus on the identification of sites and landscape features (roads and canals); the relevant sections in my article "Provinz. C. Assyrien" in *Reallexikon der Assyriologie* 11/1-2 (2006), pp. 42-68 should be consulted here.

As already stated, chapter 4 on "Satellite imagery and data interpretation" forms one of the main parts of this study: Altaweel makes use of CORONA satellite images from the 1960s and 1970s, which are limited to the visible spectrum, and the images produced since 1999 with the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER), a multispectral system which also records invisible light bands but whose resolution is lower than that of CORONA; this information is supplemented with digital elevation

data and analysed in order to identify ancient sites, remnants of ancient roads ("hollow ways") and irrigation works, many of them for the first time. The evaluated satellite images with highlighted landscape features are reproduced as fig. 10-54 (with detailed and informative captions given in the list of figures, pp. 145-150); with three to four images per plate, the level of visible detail is rather low but generally sufficient to illustrate Altaweel's analysis. The files of appendices 3-8 (pp. 135-137) provide precise information on settlements, "hollow ways" and irrigation features located with CORONA and ASTER imagery. The next chapter on "Socio-ecological modelling and landscape dynamics" details Altaweel's second analytical approach, applying agent-based computer simulation techniques in order to test different theoretical hypotheses concerning the Assyrian heartland's ancient inhabitants' interaction with their physical environment. He uses the Java-based Dynamic Information Architecture System (DIAS) modelling framework, and specifically the ENKIMDU simulation toolset designed to capture the dynamics of ancient Near Eastern societies and landscapes, developed by a team led by John Christiansen of the Advanced Simulation Technologies Center at the Argonne National Laboratory, of which also Altaweel is a research staff member. The focus of his investigation lies on highlighting the potential impact of agricultural strategies employing infrastructural features (settlements, roads and canals) on the physical landscape. To this end, he integrates complex environmental models with models of social behaviour associated with agriculture practice, specifically pedestrian transportation and strategies designed to raise the yield of the land (manuring and irrigation): fig. 55-67 illustrate the models and the graphs which map the outcome of various scenarios concerning manuring and irrigation over a period of 100 years for case studies in the Nineveh and Assur regions – the results offer ample food for thought when contemplating the economic history of central Assyria in the 8th and 7th centuries BC. Both analytical approaches are explained in clear and simple terms, equipping the readers with the information necessary to apply them in their own work; the book can therefore serve also as a methodological and technical introduction to the analysis of satellite data and the application of agent-based computer modelling and simulation for archaeological questions.

The following chapter 6 on "Landscape comparisons and analysis" (pp. 107-121) uses the insights gained in the previous analysis to highlight similarities and differences between the landscape features in evidence in the Assyrian heartland and in other parts of the empire, primarily the Syrian Jezirah which thanks to three decades of intensive excavations and surveys is today the best known archaeological region within the Neo-Assyrian Empire. A similar approach, but with a wider focus, was used by Altaweel and his co-authors Jason Ur, Elizabeth B. Wilkinson and Tony J. Wilkinson in their article "Landscape and settlement in the Neo-Assyrian Empire", *Bulletin of the American Schools of Oriental Research* 340 (2005), pp. 23-56 which, however, is not mentioned in the present book; the interested reader is advised to consult this insightful and highly relevant contribution. Altaweel emphasises the distinctiveness of the landscape of the Assyrian core area, most significantly perhaps in its accentuated position in the road network and in the continuity of major settlements from the Bronze Age to the Neo-Assyrian period (p. 120; often abandoned in other parts of the empire). In the conclusions he convincingly argues that this is an indication of the impact of the structural setup of an empire in transforming the local landscapes near the political centres (p. 123).

Using two distinct and innovative analytical approaches, Mark Altaweel addresses key questions regarding ancient settlement and land use in an area which forms part of the Assyrian core region, primarily focusing on the situation during the 8th and 7th centuries BC when it was the centre of an empire. His efforts have resulted in a wealth of new information, especially in regard to the road network, and in intriguing new perspectives on the impact of human behaviour on the archaeological landscape of northern Iraq. The author deserves our thanks as do the old and new editors of *Heidelberger Studien zum Alten Orient*, Harald Hauptmann and Peter Miglus, for resurrecting the long dormant series with this major contribution to both Neo-Assyrian studies and the archaeology of empires.

London. Karen Radner.

Stephanie Dalley, A. T. Reyes, David Pingree, Alison Salvesen and **Henrietta McCall**, The Legacy of Mesopotamia. Drawings by **Stephanie Dalley** and **Marian Cox**, edited by **Stephanie Dalley**. XVIII + 227 pp., 97 illustrations, 5 maps, 4 charts. Oxford, Oxford University Press, 1998. € 53,99.

The topic of this book is extremely worthwhile. What did Sumerians, Babylonians and Assyrians contribute to later cultures? And this is a very serious attempt to present the correct answers. But the subject is very difficult because much of it is little explored and the evidence comes from a vast range of disparate materials which single individuals do not adequately cover. Thus a group of scholars was assembled, though most is by Dalley, who seems to have been the controlling spirit. Four of the nine chapters are by Dalley (from prehistoric times to early Islam, and influences