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**Review: Human Ecology in the Wadi Al-Hasa: Land Use and Abandonment Through the Holocene**

By J. Brett Hill

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Hill, J. Brett. *Human Ecology in the Wadi Al-Hasa. Land Use and Abandonment Through the Holocene*. Tucson: University of Arizona Press, 2006. 194pp. ISBN: 9738-0-8165-2502-7. Hardcover. Alkaline paper. \$US45.

How, where, why and when are the major questions which archaeologists and environmentalists attempt to address when dealing with ancient settlement sites. Rarely are straight answers forthcoming but there still are areas that offer evidence of repeated settlement and abandonment during the last 10,000 years. This warm stage is known as the Holocene; it followed the last cold stage of the Quaternary period when sea-levels were considerably lower than at present and when ice sheets covered large parts of the middle and high latitudes. This was also a time of tremendous change in human communities. Populations were expanding from ice age refugia to re-people Europe and Eurasia, and those in the Near East were beginning to domesticate specific plants and animals and shift from being hunter-gatherers to becoming farmers or to practice a combination of the two.

The Wadi al-Hasa, a canyon draining the Transjordan Plateau, provides a range of ancient sites in varied environments and elevations, data that underpin the reconstruction documented in Hill's book. This is a tale of dynamic socio-economic, political and environmental change; humans and climate have played major roles in landscape alteration that began with Neolithic communities c. 10,000 years ago. Many small settlements of a few hundred people at most became established; they practiced subsistence agriculture, growing crops such as wheat and barley, as well as hunting. Hill posits a non-centralized, mostly individual decision-making system in the area that was conducive to good land management, though there is evidence of erosion. Non-human instigated change accompanied a shift in climate from monsoon-type to Mediterranean-type. The subsequent Chalcolithic period was dominated by pastoralism, to reduce impact on arable land, and by the rise of chiefdoms. By c.5000 years ago the Bronze Age was underway; urbanism spread and walled cities were constructed; crop agriculture, including tree cropping, predominated; there is evidence for intensified deforestation. Such activities continue through the later Bronze Age but by c.3200 years ago, the start of the Iron Age, major changes were beginning to gain momentum, notably large-scale settlement and a political

hierarchy with centres of power and evidence of interference by neighbouring Mesopotamian regions. On the agricultural front expansion occurred, camels were domesticated, terracing commenced and nomadism once again became important. The Hellenistic and Nabatean periods were characterized by sedentism and economic stability; agricultural production increased to produce a surplus mainly through improved water management. Roman occupation encouraged agricultural production and trade; such practices were also encouraged in Byzantine times that were politically stable. Agricultural expansion occurred and probably contributed to upland erosion. By 640AD control shifted to the Persian Sassanids, Byzantium's rivals. Thus began the Islamic period. Conflict and taxes caused urbanism to grow and small farmers to turn to nomadism once again. The Mamaluks of Egypt c.1300sAD re-established stability, with urban centres engaged in trade and small rural settlements engaged in agriculture. The following Ottoman period was one of overall socio-economic decline causing much land abandonment and degradation of terraces, which contributed to erosion. With the establishment of the state of Jordan, resettlement occurred and economic prosperity was encouraged by new transport systems and stability.

In terms of landscape change, there are three units: the wadi itself with its floodplain and terraces; the upland plateau; and the area where the plateau merges with the wadi bottomlands. Each has been affected by both natural and anthropogenic environmental change during the last 10,000 years, the details of which are examined in the light of archaeological and palaeoenvironmental evidence. A common feature emerges in relation to society and that is the capacity of Wadi al-Hasa people to combine settled agriculture with nomadism or to turn from one to the other, and to abandon settlements and settle later elsewhere. This is one reason why there is such a wealth of archaeological material. Hill uses statistical analysis to distinguish levels of change between cultural periods of settlement, abandonment, and re-establishment, and their possible links with environmental characteristics. He also illustrates the value of Geographical Information Systems (GIS) for evaluating erosion occurrence over time.

There is much conjecture in this analysis of temporal change and some speculation, as is inevitable in a synthesis of this kind. Data correlations and GIS simulations do not always reflect the reality of cause and effect. Nevertheless the drawing together of so much information from disparate socio-economic, geographical and palaeoecological sources provides a valuable account of life and environment in Wadi al-Hasa through the ages. Those interested in people - environment relationships, especially in the Near East - will find this book a valuable addition to the literature.

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