

# AN INTEGRATED STRATEGY FOR THE STUDY OF THE CULTURAL ECOLOGY OF MONGOLIA

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*Abstract*

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## Abstract

The analysis of the cultural ecology – defined as human adaptation to the natural environment as mediated by culture – of Mongolia presents some special problems. These can be solved by making use of a research strategy that integrates several methods--remote sensing, archaeology, documentary research, ethnography – and applies them to prehistoric, historic and contemporary levels of data. Developed in connection with research on a Silk Road oasis in Xinjiang and tested during a field trip to Inner Mongolia Autonomous Region in 1990, this strategy offers promising results.

A promising field of research has evolved in recent decades. Known as cultural ecology, it makes use of a paradigm that includes a human population, a natural habitat and the interaction between them. (Netting 1986) The population habitat and their interaction constitute a cultural ecosystem is "cultural", since the interactions between a human population. and its habitat are always mediated by culture. Culture itself is of course a complex system of technical process. Social customs and ideology. The cultural ecosystem is characterized by inputs and outputs of matter (for example, the food consumed by the population) and energy (for example, the work performed by the population). In addition there are inputs and outputs that consist of information. The inputs and outputs are typically connected by complex relations of positive and negative feedback, so that the cultural ecosystem is capable of a wide range of behaviors ranging from equilibrium to violent instability.

Cultural ecology has grown out of theoretical developments in many different fields: cybernetics and systems theory, biological ecology, geography, cultural anthropology, the mathematics of chaos, economics, etc. It offers several advantages as a research paradigm. It calls attention to specific types of data that must be collected; some types of data will be quantitative but there is room for the detection of structures that must be described in qualitative terms. It recognizes the importance of ideological patterns – knowledge, beliefs, values, etc. – in regulating human behavior. It calls attention to the fact that the influence of the natural environment on human societies is not a matter of simple determinism. It causes us to examine the impact of human activities on the environment – a matter of importance in all societies but especially in societies attempting to develop modern industrial systems.

It would seem to be desirable to carry out research on Mongolia using the paradigm of cultural ecology. Whether our interest is purely academic (for example, understanding the prehistory of the region) or practical (for example, solving problems of livestock management or the exploitation of mineral resources), cultural ecology offers a theoretical framework into which we can fit all of the relevant data, and from which we can obtain productive models, specific research questions and hypotheses, and reliable conclusions.

Doing research on the cultural ecology of Mongolia presents some special problems. The vast size of the country, the relative sparseness of historical documentation and the shortage archaeological data are obstacles. Historians, geographers and other scholars have raised many questions about Mongolia that are similar to the kinds of questions cultural ecologists ask, without being able to find definitive answers (for example, what role has climatic change played in Mongolian history?) (Huntington 1910). Merely translating these questions into the language of cultural ecology does not necessarily bring us any closer to answering them.

Fortunately we now have some new tools for finding answers to some of the old questions. Foremost among these tools is remote sensing. Remote sensing includes several techniques, some dating back many years, others developed recently: aerial photography, electronic satellite imaging, radar imaging from aircraft and space vehicles, measurement of terrestrial magnetism from aircraft, etc. The common features of these techniques include: remote location of a sensor (film camera, television camera, radar receiver, etc.), lack of contact with the object; about which data are collected, speed and relatively low cost of data acquisition. Some techniques have special features; infrared and radar sensors can "see" objects not visible to the human eye, and radar can penetrate clouds and even certain types of

soil. We now have the possibility of mapping land forms, geological structures, vegetation and other surface features over very large areas, as well as detecting the presence of human artifacts – buildings, roads, agricultural activities, irrigation systems, etc.--including prehistoric settlements. As techniques improve, the resolution of the sensors improves to the point that almost any human activity in the past or present will leave a detectable trace. (Holcomb 1992) The development of GPS (a satellite-based navigational system that can provide precise geographic coordinates of any point on the earth's surface) and GIS (computer-based programs for generating data bases of many kinds of geographic data, using a common grid of gee-coordinates) have made all kinds of remote sensing much more "user-friendly".

In addition to new tools, there are new opportunities for the collection of data by more conventional means. Recent changes in the foreign relations of Mongolia open the possibility for archaeologists, historians, linguists and ethnographers of many nations to join with Mongolian scholars and scientists in a co-operative effort to increase our knowledge about the prehistory and history of the nation, as well as the details of traditional and contemporary Mongolian culture. The Nomads' Route International Expedition and Seminar are concrete evidence of these new opportunities.

It would seem to be feasible, therefore, to propose a research strategy that is based on the paradigm of cultural ecology and that integrates the available research methods, old and new, applying them to the entire field of phenomena of interest, whether prehistoric, historic or contemporary. In addition to remote sensing, the principal methods to be employed include those drawn from archaeology, documentary research and ethnography.

### Remote Sensing

Remote sensing, especially the use of satellite imagery, is admirably suited to research on the Mongolian landscape. It is possible to obtain images of any part of Mongolian territory; currently those obtained by the SPOT system are perhaps of highest quality, while other satellites soon to be launched (for example, LANDSAT 6) promise to provide excellent data. These images can be processed and analyzed by several computer programs (IERDAS and GRASS are two that are widely used) to obtain information about almost any aspect of the physical or biological environment, plus the information about human activities, past and present, discussed above. The use of GPS and GIS can produce maps of these phenomena with superb precision. The fact that remote sensing will be used in Mongolia for other

purposes as well (for example, mineral prospecting and government planning) will make data even more economical to obtain.

### Archaeology

Archaeologists, using the maps of natural and cultural phenomena produced by remote sensing, will be able to plan an efficient strategy of exploration, survey and excavation to supplement existing archaeological knowledge about Mongolia. ("Archaeology" is understood to include auxiliary disciplines such as palynology, osteology, zoo-archaeology, etc., as well as the location, excavation and analysis of human artifacts.) Both prehistoric and historic settlements, subsistence activities, trade and migratory routes, etc., will yield information of value. While it is not useful to make a sharp distinction between prehistory and history in Mongolia, it will be important to focus on two different periods: the early period, including cultures of the Paleolithic-Mesolithic-Neolithic transition, and a later period that can be correlated with peoples of known linguistic or political affiliation. The exact strategy of archaeological work will depend to a great extent on the informed judgement of archaeologists, but recent developments in techniques of sampling can be useful in dealing with large areas that lack local differentiation. Ethno-archaeology, the use of ethnographic data obtained in recent times to interpret the archaeological record is another one of the newer techniques. (Binford 1983; Gould 1988; Greenfield 1988; Pulleyblank 1983 }

### Documentary Research

I use this term in place of "history" to suggest that the documentary record can be used to answer new questions, including questions suggested by the paradigm of cultural ecology. It will be a novel experience for historians to assist in sifting through the documentary record for data about subsistence activities, population changes, epidemics and health conditions, etc. Conventional history has often overlooked the significance of environmental variables in shaping the actions of human beings or has neglected some of the data available in the documentary record. As Morgan has pointed out, the documentary record of Mongolia is full of reliable information, especially when supplemented by accounts of anthropologists and other travelers of the last two centuries: "The potentialities of this mass of evidence are not likely to be exhausted for a very long time to come." (Morgan 1986:31. A useful compendium of modern data on many ecological variables is to be found in Thiel 1958.)

## Ethnography

The fact that many aspects of the traditional culture of the Mongol people are still extant is one of the most positive features of the research situation. Questions about traditional technology, social customs and ideology that are generated by historical documents or archaeological data can be pursued by ethnographic research among living people. At the same time, ethnography defined as the investigation and recording of a functioning culture, can contribute to the understanding of processes of culture change. A comparison of ethnographic accounts from the 19th century, for example, with contemporary accounts will provide data for detailed analysis of recent change, while the analysis of recent change will shed light on earlier change. (Gilmour n.d.; Hue n.d.; Pozdneyev 1971) (Reference has been made already to the potential contributions of ethno-archaeology; see above.) Cultural ecology has had an influence on ethnography, requiring for example detailed quantitative studies of work and diet to provide data for the input-output approach to cultural ecosystems; but there is still a place for the qualitative, descriptive study of belief systems, values and other ideological patterns with the intention of revealing their role in regulating such ecosystems. (Netting 1986; Zhukovskaia 1988) Studies of the environmental impact also can be improved by careful ethnographic work (a valuable collection of ethnographic data on traditional Mongolian culture is Jagchid and Hyer 1986).

## Conclusion

The proposed research strategy is being applied in the Kuqa Project, a study of an ancient Silk Road oasis in Xinjiang Uygur Autonomous Region, People's Republic of China. (Banks 1992) While the project is still in progress and final conclusions have not been published, it is possible to report that the strategy is producing promising results. Since the two areas--Mongolia and Xinjiang--present similar problems for the researcher the completion of the Kuqa Project will provide a model for future research on Mongolia. The proposed research strategy calls for the participation of specialists drawn from many disciplines. Much of the work can be done by scholars and scientists working independently, but only if there are full communication among them. The modern institution of the network--a community of scholars linked by rapid means of communication such as fax or electronic mail -- is ideally suited to this kind of collaboration. A Mongolian Studies Network has been established by the author for this purpose. (Fax number: USA 919-759-6074. E-mail INTERNET: banks@wtunet.wfu.edu) Interested scholars are invited to participate by sending

research proposals, preliminary reports, bibliographic information, etc., for exchange with others working on related problems.

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