# Research Design: The Impact of the New Archaeology on Palestinian Archaeology

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Hiroaki Watanabe

*Abstract: This article reviews the theory behind research design, its background, its influence, and the limitations and future prospects. Developing research designs is based on General Systems Theory in which culture is a system composed of subsystems. The necessity to make explicit what we are trying to learn has had significant impact as shown in the projects discussed. Although General Systems Theory has limitations, systems thinking made a major contribution to our understanding of the necessity to build research designs.*

## 1. Introduction

The New Archaeology that has become mainstream in archaeology since sixties has different concepts from those of traditional archaeology, as shown in the comparison table below. The nature of archaeology shifted from merely reconstructing the past and people's lives to explaining past change with the help of explicit theory. While historical explanation is relied upon by traditional archaeology, culture process, change in economic and social system, is what the New Archaeology aimed at. Traditionally, archaeology's task was to piece together the past, but making hypotheses is considered the appropriate procedure of the New Archaeology which includes designing hypotheses, making models and reaching their results by deduction. Conclusions will no longer be accepted just because of the authority or the status of the research personnel. Hypotheses testing is what validates archaeological theo-ries. Answering specific questions with the use of research design is the scope of research, not accumulating data which are not pertinent. Quantitative data make it possible to ana-lyze statistically and attempt sampling and significance testing, in contrast to the tradi-tional verbal approach. The New Archaeologists were optimistic about the reconstruction of social organization and cognitive systems while traditional archaeologists remained negative (Renfrew & Bahn 2008:41).

[1] I would like to express my gratitude to Dr. Steven Olson for reviewing this article and suggesting necessary corrections for improvement.

| Concepts: | Traditional archaeology | New archaeology |
|---|---|---|
| The Nature of Archaeology | Descriptive | Explanatory |
| Explanation | Culture history | Culture process |
| Reasoning | Inductive | Deductive |
| Validation | Authority | Testing |
| Research Focus | Data accumulation | Research design |
| Choice of Approach | Qualitative | Quantitative |
| Scope | Pessimism | Optimism |

Comparison Table of Concepts, adapted from Renfrew & Bahn (2008:41)

Among these concepts of the New archaeology, the attempt to develop research designs probably has had the most significant impact on Syro-Palestinian archaeology. The necessity to develop research design has forced us to make explicit what we are trying to achieve and what kind of method we are to use (Dever 1988:343). In this paper, we will discuss the theory behind research design, its background, its influence on our branch of archaeology with case-studies and the limitations and future prospects.

## 2. Necessity of research design

As early as the mid-sixties, Binford pointed out that very little thought had been given to research design. When we were asked what we were excavating for, we would answer that we were trying to uncover data to clarify the past. However, lack of concern with research designs prevented archaeologists from recovering relevant data to the questions they would wish to answer (1964:426).

Because we failed to make clear statements as to the data we were hoping to recover, regrettably we were unable to obtain the relevant data. Binford (1964:427) recalled his experience that he often found other archaeologists' data lacking in many important facts. These could have been obtained if they had paid attention to the pertinent questions.

For example, hoping to prove that many of the sites in a certain area were situated near streams, Binford attempted to find data for his question in vain since the archaeologist who conducted the survey in the area did not provide information of the survey' s concentra-tion. This led to two possibilities: the reason why sites away from streams were not re-ported is that the sites were simply absent, or that areas away from streams were not investigated. This kind of ambiguity elucidates the fact that we may have questions that cannot be answered because of insufficiencies in our excavation technique and publishing

practice (Binford 1964:427).

Although this cannot be completely avoided, by devising research designs we will be able to consciously collect the data relevant to the questions we are presently asking. As archaeological investigations progress, it is expected we will recognize as significant data previously unnoticed. As Binford predicted, we will be more and more concerned with developing new and improved research designs. Fieldwork without the framework of a well-planned research design is a thing of the past (Binford 1964:427～441).

## 3. General Systems Theory

The theory behind research design is General Systems Theory. The New Archaeology's argument that archaeological reasoning should be made explicit led to the growing consensus among archaeologists that culture should be regarded as a system composed of subsystems (Binford 1962:217; 1965:203; Sabloff 1981:2). As Flannery (1967:120) states, the strategy of the process school is to isolate each system and study it as a separate variable. Considering culture as a system, various subsystems within the system can be recognized; these subsystems are technology, ideology, trade, demography, settlement pattern, and so forth. It was found that General Systems Theory would enhance this systemic view of culture (Trigger 1989:25).

General Systems Theory was first advanced by brilliant thinkers like von-Bertalanffy (1968). Major aims of the Theory are: (1) The various sciences have a general tendency towards integration; (2) A general theory of systems appears to be a center of such integration; (3) In order to aim at exact theory in the non-physical fields of science, such theory may be an important means; (4) The goal of the unity of science will be achieved by this theory (von-Bertalanffy 1968:38).

Each subsystem, according to General Systems Theory, has the phenomenon of feedback. Based on the notion that a system is equipped with input and output, feedback is the condition that a portion of output is channeled back to form a continuing part of the input. When the feedback is negative, negative feedback is produced by a change in output, and the negative feedback returns to function as input against the original change. This negative feedback is employed by all living systems; temperature controlling mechanism is a typical example: when external temperature rises (input), body temperature also rises and we sweat (output), which reduces the effect of input. When negative feedback maintains a

system in a constant state, the system is said to be in homeostasis. Positive feedback, however, can take place. In this situation, the change produced in the output influences the input positively, and growth may occur. Progressive growth and change, and the emergence of new forms are led by this positive feedback. One subsystem, thus, can be considered to influence and be influenced by another (Renfrew & Bahn 2008:487).

Many studies have been published in which General Systems Theory was explicitly used in analysis. Flannery's work (1968) about early Mesoamerica is considered to be land-mark study. Flannery viewed man and the southern highlands of Mexico as a single complex system. The system consists of many sub-systems which influenced mutually between 8000 and 200 B. C. E. His analysis includes the study of regulatory mechanisms and negative feed-back processes that promote homeostasis and counteract displacement from a stable condi-tion over long periods of time. Positive feedback processes may also amplify deviations, causing systems to expand and reach stability at higher levels (1968:68). Flannery, in con-clusion, mentions that the approach of his study does not attribute culture evolution to dis-coveries, inventions, experiments or genius, but enables us to treat prehistoric cultures as systems (1968:85).

Rouse (1972:245) in his *Introduction to Prehistory*, showed prehistorians' attempts to develop a scientific approach. Zubrow (1975) made a study of long-term population re-source relationships in an ecological framework. A collection of eight papers dealing with archaeological change was presented in Hill (1977). Almost 20 pages were devoted to an analysis of systems theory concepts and archaeological applications in the text book by Hole and Heizer (1977:358-376). Clarke (1978) made the most detailed discussion of the utiliza-tion of systems thinking in archaeological research.

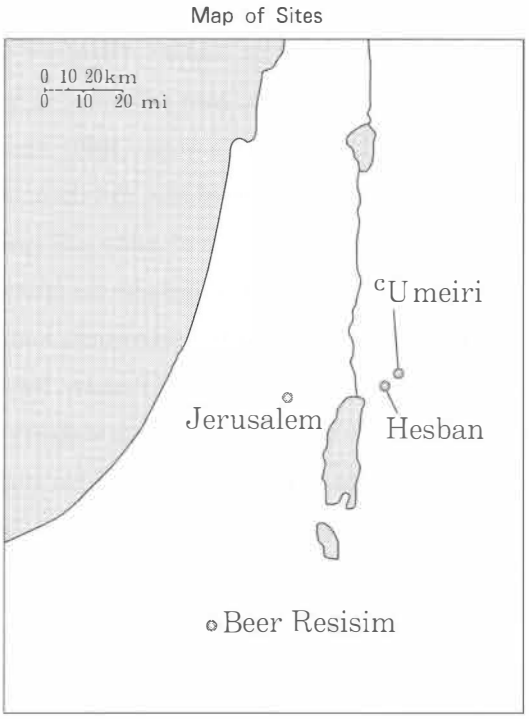
## 4. The impact on Palestinian archaeology

With the necessity to develop explicit research designs, Syro-Palestinian archaeology began to advance toward a true discipline. We began moving away from descriptive stage without such designs to guide our research and to decide what kind of data to collect (Dever 1981:15-16).

In contrast to the older large scale tell excavations, more and more field projects are concentrating on survey, regional studies, settlement-pattern analysis and so forth. Multi-disciplinary staff is often employed so that the total environmental and cultural context can

be reconstructed (Dever 1988:342). Among many projects, the Central Negev Highlands Project, and Hesban excavation with Madaba Plains Project are worth mentioning.

### 4.1 The Central Negev Highlands Project




The Central Negev Highlands Project (1978-80) was a joint American-Israeli project to investigate archaeology and arid land studies from a multi-disciplinary perspective. The project was conducted at one-period sites of Early Bronze Age IV period (EBIV) Middle Bronze Age I period (MBI) (2200-2000 B. C. E.) in the Negev. The research designs of 1978 season were made explicit as follows:

Firstly, how could mankind live in such a hostile environment as the Central Negev Highlands today? Secondly, if EBIV was the only period that the Negev Highlands were occupied, what was the reason? Thirdly, was the climate in the EBIV period milder than that of today enabling the large-scale occupation to flourish? Fourthly, why did the EBIV settlers deliberately select this hinterland rather than suitable area in central Palestine? Fifthly, on what kind of economy was the occupation based; namely, was the economy dry farming, pastoralism or trade? Sixthly, will the ethnicity of the inhabitants be revealed by the archaeological reconstruction of the material culture, and contribute to the Amorite expansion theory during 2300-1800 B. C. E. ? Finally, can a comprehension of the relation of inhabitants to this hostile environment in the EBIV period have any implication to us today? (Cohen & Dever 1978:29-31).

The 1979 season had three objectives. Firstly, in order to undertake an expansion of previous fieldwork, problems of the procedure needed to be determined. Secondly, a regional survey had to be done so that the archaeologists could understand Beer Resisim, the principal site in the region, in its environmental setting and make logistic plans to expand the investigation to surrounding features in the region. Thirdly, the architectural remains of Beer Resisim had to be clarified so that the excavators could accumulate comprehensive data of

the material culture and its economic background (Cohen & Dever 1979:41).

The excavation of Beer Resisim was the first attempt to apply multi-disciplinary survey and environmental concern to an EBIV site in western Palestine. The brief results of the project are as follows: There is no complete answer to the questions why the sites were located where they were and how their economies were supported in a hostile environment of the Negev; however, Cohen & Dever (1981:74) state that this subsistence system was based on a delicately balanced strategy that exploited the Negev's unique environment most efficiently, with the availability of winter pasturage and access to copper sources in the Sinai perhaps the deciding factor in the choice of this general location. The pottery found represents typical southern repertoire and dates from EBIV to late MBI. Thus, the occupation occurred from ca. 2250 to 2000 B. C. E., when the settlement was abandoned (1979:57).

### 4.2 Hesban excavations

The excavations at Tel Hesban were carried out initially under the name of the Heshbon Expedition. The name Heshbon rather than Hesban indicates the excavators' preoccupation which attempts to illuminate biblical events relating to the site, noted in the Old Testament as Heshbon. The biblical narrative describes that Heshbon was the capital of Sihon, king of the Amorites. When the Israelites arrived from Egypt, they were denied permission to travel through Sihon's estate. A war took place which the Israelites won. The sons of Reuben, then, settled in the city of Heshbon (Numbers 21:21-26,34; Joshua 13:15,17). The original purpose of the Heshbon Expedition was to find support for a hypothetical 15thc. B. C. date for these events. However, the earliest strata the excavators discerned was Iron I period (1200 B. C. E.), indicating that the Israelite conquest of Heshbon turned out not to have occurred. This devastating fact caused the excavators not only to use the name of Hesban instead of Heshbon but also to broaden their concern about the goal of the expedition (LaBianca 1990:21-24).

LaBianca (1990:3) states that the primary purpose of investigation is to reconstruct and analyze various dimensions of long-term changes in human occupation and livelihood. In order to grasp the archaeological record from Tell Hesban as a whole, a new systems perspective was formulated: the food system along with the concepts of intensification and abatement, sedentarization and nomadization (1990:xiii). A food system is a complex unity of all activities carried out by a group of individuals in order to procure, process, distribute, prepare or consume food, and dispose of food remains (LaBianca 1990:9-12).

The food system concept includes all institutions and processes providing and transforming foodstuffs. It focuses on daily activities, examining interactions between populations and their environments while avoiding the sedentary bias. It focuses on hunting and gathering, and on feeding relationships, and provides a framework using varied lines of research (LaBianca 1990:9-12).

The parameters of food system conditions are environment, settlement, land use, operation, and diet. Environment is characterized by plant and animal remains; land use by plant and animal remains, water and soil management works, and settlement conditions; operation by food storage, water management, and food processing installations, market places and road remains; diet by plant and animal remains, human skeletal remains and food residues on pottery (LaBianca 1990:9-12).

LaBianca (1990:xviii) believes that the food system perspective opens the door to understanding long-term cultural changes. The reason is that it has been intimately linked to the concepts of intensification and abatement, sedentarization nomadization. These concepts will help to grasp the long-term changes which have occurred at Hesban. Because the quest for food is likely to involve both genders, all ages, and all classes of society, LaBianca also believes that the food system perspective can shed light on the work worlds and social worlds of men and women, of adults and children, and of rich and poor (1990:xviii).

While the finds at Tell Hesban had not been collected at first with the food system perspective in mind, Madaba Plains Project at Tell el-`Umeiri and vicinity had the opportunity from the start to design and conduct a survey based on this perspective (LaBianca 1989:23).

According to Geraty et al (1989:5), changing strategies for obtaining food has determined the changes which turn up archaeologically in settlement and land use patterns, operational facilities, and diet. This assumption is supported by the fact that the largest share of most people's time and energy in antiquity has been devoted to the quest for food. Thus, the excavators regard various activities such as constructing terraces, markets, roads, and storage as interconnected and integrable (Geraty et al:1989:5).

Using the notion of input, the change of food systems is said to intensify or abate depending on increased or decreased input of human management and energy. It seems that intensification and abatement are reflected in the tension between the processes of sedentarization and nomadization and that the processes have occurred side by side in the Madaba Plains. Hence, the task is, Geraty et al (1989:6), states, to ascertain the factors contributing to changes in the rate of sedentarization and nomadization over the time range in

which this area was occupied.

## 5. The limitations and future prospects

Because the attempt to make explicit what we are trying to learn is based on the utili-zation of General Systems Theory, this approach has to incur the limitations of the Theory.

First of all, General Systems Theory is ultimately positivism that pursues the unity of science and a general law. This optimistic view, however, has never been realized (Wenke 1981:102), and it is unlikely to happen in the future. Even the food system concept which seems to be successful in Hesban and Madaba Plains cannot be applied everywhere as LaBianca (1990:245) admits. In other words, the food system is not a universal but a regional concept. The statement of Rouse now sounds bizarre: "We shall never be able to achieve lasting peace ... until we are able, by the use of concepts (systems approach) ..., to recognize the existence of other groups and subgroups,... upon our ability to do so rests the future of the world" (1972:245).

Redman (1973:16) defines a system as "a functioning set of elements that are interrelated so that a change in one affects the others." However, the concept of a system has not been universally defined. There are almost as many different views of systems and systems theory as there are theoreticians and practitioners (Salmon 1978:177; Wenke 1981:101). The number of the definitions continues to rise as the General Systems Theory is employed by ar-chaeologists to develop explicit research designs.

As Hodder (1986:32) indicated, the systems approach is not able to account for the great richness, variability and specificity of cultural production, and individuals and their shared thoughts are passive by-products of the system; human activity is timeless, the product of systemic interrelationships rather than being historically derived. One may question whether we have to analyze forever that one behavior is an example of positive feedback and the other is something else (Wenke 1981:102).

The archaeological theory that archaeologists are longing for cannot be extracted from General Systems Theory (Salmon 1978:174). That is why archaeologists tended to use General Systems concepts in a piecemeal fashion, rather than seeking to construct an integrated body of theory (Trigger 1978:11). Construction of a theory of great generality is not even in sight while the concept of systems is deliberately applied to variables of culture such as trade, settlement culture, and demography.

General Systems Theory, nevertheless, contributed to the understanding of the great complexity of cultural processes and organization. When we viewed culture as a system com-posed of subsystems, we also recognized that systems were complex. It was this complexity that demanded that archaeological field work should be conducted clearly to collect maxi-mum possible data under the direction of explicit research designs. These designs forced us to clarify and question what we are trying to learn in archaeology, and will continue to do so. Though General Systems Theory is used in a piece-meal or simple-minded fashion, the convenience of the systems concept to regard culture as a system will help and enhance devel-oping sophisticated research designs for every project in our field, until a better theory, or a new paradigm emerges and takes that task.

## 6. Conclusion

In conslusion, the attempt to develop research designs of the New Archaeology has had the most significant impact on Syro-Palestinian archaeology. The developing of re-search designs is carried out using the notion that culture is a system composed of subsys-tems. This notion is based on the General Systems Theory first advanced by von-Bertalanffy (1968), successfully applied to archaeology by Flannery (1968), and enhanced by Clarke (1978). The necessity to make explicit what we are trying to learn has brought our branch of archaeology from the descriptive into the explanatory stage: Syro-Palestinian archae-ology has moved toward a true discipline.

The impact is remarkable in the projects we have reviewed. The Central Negev Highlands Project made explicit research designs to investigate archaeology and arid land studies from a multi-disciplinary perspective. The Hesban excavation made a dramatic or painful transformation of its objective: from Heshbon in which confirmation of the biblical narrative was the primary objective to Hesban in which an elaborate food system perspective was employed. This new systems concept was also applied to Madaba Plains Project.

Although General Systems Theory has limitations such as its optimistic perspective, unsettled definition of a system, passive individual, and inability to produce archaeological theory, systems thinking made a major contribution to our understanding of cultural com-plexity and of the necessity to build research designs to tackle this complexity. Thus, Syro-Palestinian archaeology will never be the same; after all, as Clarke (1973) implies, "we have lost our innocence."

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