The Garbage Project

A NEW WAY OF LOOKING AT THE PROBLEMS OF ARCHAEOLOGY

By WILLIAM L. RATHJE

Photographs by STAN FORSYTH and WILSON HUGHES

William Rathje with a load of fresh meat representing the average amount of meat wasted by a Tucson household in one year. A middle class house wastes more than this amount.

The aim of archaeology is to recover the nature of perished civilizations from imperishables. The archaeologist scrutinizes the material remains which come into his hands in order to reconstruct the behavior involved in their production, acquisition, use and eventual discard. Lately, many professionals have turned their attention to modern “primitive” societies in Africa, Australia and other areas to increase their sensitivity to the interrelationships which exist between materials and human activity; they have studied stone tools, pottery and other material objects in order to understand better how these things fit into different patterns of human behavior. The insights thus gathered add considerable sophistication to their interpretive capacities. So far archaeologists have devoted themselves exclusively to understanding the past in terms of evidence from the past, or to understanding the past in terms of correlates from the present. Now there is an additional use—or better, application—of the science of archaeology. This involves a systematic look at modern society from the archaeological viewpoint, and this is what the University of Arizona’s Garbage Project is seeking to provide.

The Garbage Project, initiated in 1972 with the complete cooperation of the Tucson Sanitation Department, has undertaken to study the material culture of Tucson, Arizona, as it is being
As everyone knows, Americans live in an era which is threatened by resource depletion and environmental ruination, and many of today's social-science researchers are examining urbanized society to see how social conditions relate to resource management as it is practiced (or mispracticed) in the contemporary household. The information they seek is information which is badly needed. But the results of the interview surveys being conducted by sociologists may not be entirely adequate; while they provide an understanding of the beliefs people have regarding their habits of resource management, they cannot describe satisfactorily the actual resource management these same people practice. For example, owing to present cultural norms, few individuals can be expected to discuss with candor such things as alcohol problems, illicit drug use or large-scale food-waste, especially with interviewers whom they have just met and scarcely know. Even those who are willing to be totally frank are prone to distorted recollection, and so the picture which emerges is a good deal less than accurate.

A more skeptical view is needed of society's habits of material waste, and this is the view which archaeology has to offer. By training, archaeologists maintain a healthy lack of commitment to the accuracy of the written word—or, as in this case, the spoken word. Since their discipline functions to corroborate or disprove historical sources through the analysis of quantifiable materials, they are readily qualified to evaluate modern interview-survey techniques and their results. Waste is the result of human actions and not intentions; therefore waste materials are a telling and honest index of a society's way of life.

The Garbage Project already has some reason to question conclusions derived from verbally-collected data on modern habits of consumption and waste. According to interview surveys, for instance, significantly more vitamins are consumed in Tucson by people with intermediate incomes than by those with lower ones. Our original garbage data, from 1972, show exactly the opposite: the largest quantities of vitamin containers were discarded by those on a very low income scale.

But the members of the Garbage Project are not so much interested in refuting the findings of others as in complementing them and in discovering what significance the discrepancies have. In fact, we share a mutual interest with our sociological colleagues in refining interviewing techniques, and we are planning a joint venture with an interview-survey project being directed by Dr. Dileep Bal of the University of Arizona; his project, known as ECHO (Evidence for Community Health Organization) deals with patterns of consumption directly related to matters of health. The intention is to record traces of drug, alcohol, cigarette, vitamin and nutrient consumption left in garbage from a selected sample of neighborhoods; after analyzing the garbage from these households for a month, we will make a survey of their occupants using questions designed to enable us to test the answers against the data collected from the garbage. The objective will be to identify and quantify the weaknesses in the two methods of gathering information.
How does one "excavate" modern-day garbage? Our sampling design had to be a little unusual, since Tucson is larger than the sites of Teotihuacán and Nineveh put together. To obtain a representative sample of the households in the city, we resorted to the census reports from 1970: we grouped the 66 census tracts into seven different clusters and then studied the garbage from tracts representative of each cluster. We studied 13 such tracts in the course of 1973 and 19 in 1974. On a biweekly basis last year, and on a weekly basis this year, the Tucson Sanitation Department collected all the refuse from two households chosen randomly in each sample tract. Most of this material came in either plastic or paper bags. In order to cope effectively with the vast array of items, we selected 133 variable categories designed to cover health, nutrition, personal and household sanitation, education and amusement (both for children and adults) communication and pet related materials. The study was conducted in the Sanitation Department's maintenance yard, where stu-
dent analysts examined and recorded the garbage by item number, volume, cost, material composition, brand and waste weight. Although we examined refuse over an eight-month period, our study could encompass only six hundred out of 110,000 households, or less than one per cent of all the households in Tucson.

To protect the anonymity of the households studied, we recorded garbage samples only by the number of the census tract. Personal items were of no interest since we were looking only for general patterns of resource management; therefore, we did not examine, record or save any names, addresses, photographs, letters or other personal items. The student workers, whose number has now increased to fifty, were given immunizations and provided with lab coats and gloves; happily, to date, none of them has lost any time through illness contracted on the Project.

Our results so far have yielded some interesting conclusions. While considering both the garbage which had been analyzed and the results of survey interviews, we discovered that status and brand items are purchased most regularly in households containing young adults, the aged or members of ethnic minorities. For example, although steak is no more nutritious than hamburger, middle-class families generally bought (and discarded wrappers of) ground round while the other groups mentioned above regularly purchased more costly cuts of beef.

Although some stereotypes were confirmed by the findings, many were disproved. Middle-class white families, for instance, eat proportionately more ham, lamb, pork and chicken than Black, American Indian and Asian households. In addition, the lowest income groups use the most costly educational items for children and the largest quantities of household sanitation items; they also consume the greatest quantity of vitamins, mineral and bread.

Some general patterns of waste have already begun to emerge. As one might expect, there is a high rate of expensive waste of pastry and take-out meals; but the most significant waste is of staples—beef, fruits and vegetables, discarded often in unopened or only half-opened packages. Whereas white middle-class households seem to waste such commodities very consistently, ethnic minorities were found to avoid this sort of patterned waste. Our data show, moreover, that in their habits of resource management, the young and old are much alike.

The waste in the average household might seem small; but it becomes very costly when it is viewed on a large scale. It is not the occasional whole steak and unopened can of cranberries which are the real contributors to waste; rather, it is the everyday patterns of food purchase, consumption and storage which lead to significant mismanagement. It would seem, given inflation and the national concern over the state of our environment, that there is enough pressure on housewives to conserve; but the facts belie this
This recording sheet, read in conjunction with the Garbage Item Code List, contains the following information: the data were collected from a census tract 18 on April 19. Item 1 consisted of a paper towel sheets, 26 in number; the item discarded was made of paper of which more than 9 units were counted (nine is the highest number that can be recorded in column 50–57, if there are more than nine units it is necessary to refer to column 14–16). Item 2 consisted of one container of beef (hamburger); 12 ounces were bought for 76c in Luck Supermarket. None was wasted, and only the plastic container was discarded. Item 3 also consisted of beef (sirloin steak); 29 ounces were bought at $3.90 from Luck Supermarket. Fifty grams were wasted; the plastic container was discarded.

appearance. The Garbage Project collected much of its beef-waste information at the height of the beef shortage in the spring of 1973—at a time when there must have been pressure not to waste beef products. Perhaps, in a ironic way, the shortage actually compounded waste as shoppers purchased in bulk in order to save a few pennies and then found themselves unable to properly store the meat they had bought; such errors, in storage and the scheduling of meals, are typical of middle-class households, which regularly buy cheap meats but which also, paradoxically, tend to waste expensive cuts which they buy at random. We estimate that such households average $100 a year in the waste of edible beef alone; this means that at a minimum, the city of Tucson, Arizona, is wasting $500,000 worth of beef each year.

Archaeological research into modern-day garbage will take time to refine. We must reconstruct purchase and consumption patterns with an eye to such variables as garbage disposals, fireplaces, household pets and the recycling of containers, all of which destroy a certain amount of evidence. But then, archaeologists have always been concerned with such factors. The most exciting and fruitful thrust in recent methodological developments, as far as I am concerned, involves the effort to reconstruct the position and importance of material items in ongoing systems from the discard context in which they were found. Put a bit more simply, the concept of rate in resource flow is basic to one's ability to extrapolate patterns of sustained behavior from garbage samples. We undertook an investigation in thirty Tucson households to determine the frequency of container discard and to correlate this rate with patterns of purchase and consumption, as determined from information given by the members of each household. The results indicated, as one might expect, that the rates of purchase, consumption and discard were systematically related.

The notion of sustained rate, then, seems to be an accurate characterization of the ongoing process of household consumption, discard and replacement of groups of items during regular periods of accumulation. It also seems to provide a firm basis for inferring patterns of consumption and purchase from discard behavior. Once it is refined, the concept of rate may prove an extremely useful tool for the study of site formations by archaeologists faced with the problem of reconstructing long-term patterns of sustained behavior from garbage middens.

Results of studies such as ours may also prove instructive to archaeologists coping with other traditional problems. It has always been assumed that waste or conspicuous consumption in ancient societies is related to the elites of those social systems. Modern refuse, at least in Tucson, suggests another conclusion altogether. The city's high-income residences are associated with the discard of very little waste of either food or
tools. It is the middle-income families, again, which discard large quantities of useful and edible items. This contrast between ancient and modern resource-management correlations may be due to changes in social organization and complexity; but they might also provide archaeologists with new fuel for alternative explanations of past behavior. Either way, the study of garbage can afford an informative view of unfolding cultural processes, both those of the past and the present.

The Garbage Project is the result of the ideas and hard work of its field director Wilson Hughes, its assistant director Frederick Gorman and the nutritionist Gail Harrison along with the encouragement and resourcefulness of A. Richard Kasander, Jr., Raymond Thompson, Hermann Bleibtreu, Tom Price, Sonny Valencia and the staff of the Tucson Sanitation Department. The most critical ingredient in the project was the unflinching dedication of the student volunteers, who slogged their way through kitty litter and dinner slops. Portions of the investigations were supported by Biomedical Sciences Support Grant RR 07002 from the National Institutes of Health. Work is continuing through small grants from SCA Services, Chevron Oil, General Mills, Alcoa Aluminum, Hoffmann-La Roche and Thomas J. Watson, Jr.

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