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http://www.scribd.com/doc/75131527/Colin-Renfrew-Archeology-the-Key-Concept

"SITE CATCHMENT ANALYSIS" (p. 172 – 176)

Site catchment analysis (SCA) was first defined in 1970 by Claudio Vita-Finzi and Eric Higgs to refer to the analysis of archaeological sites in relation to their environmental surroundings. It provides a means of creating and testing hypotheses about prehistoric economies independently of the material remains recovered in excavation. The initial spur to its development was the investigation of agricultural origins, and the problem of reconstructing economies at sites where plant and animal remains are poorly preserved. The basic premise is that sites supposedly dependent on crop agriculture should be located close to cultivable soils, sites dependent on deer hunting close to suitable deer habitat, and so on. In order to define the area relevant to a given site, Vita-Finzi and Higgs used simple cost-benefit principles, supported by a variety of ethnographic and historical examples, to suggest that the maximum radius of daily exploitation for hunting and gathering sites should be 10 kilometres and, for the more labour-intensive activities of agriculture, 5 kilometres. Since local topography can impede movement across the landscape, they defined these radii in terms of walking time—two hours and one hour, respectively. In the first formal application of the technique, students were despatched to carry out timed walks from a sample of Natufian and Neolithic sites in Israel and Palestine, making notes on topography, soils, vegetation and other environmental variables along the way. The resulting maps were used to reject the hypothesis of incipient agriculture in the Natufian period, because few of the Natufian sites were located close to suitable topography or soils, in marked contrast to the sites of later periods. In 1972, Higgs and Vita-Finzi renamed the above technique Site Territorial Analysis (STA), the analysis of site exploitation territories (SETs), defined as the areas habitually used for daily subsistence from given locations. They limited the term SCA to the analysis of site catchments in the strict sense, defined as the areas in the surrounding landscape from which materials preserved in an archaeological deposit are derived. The two techniques are complementary in that STA works inwards from the surrounding landscape to the archaeological site, whereas SCA works outwards from the materials in an archaeological deposit to their nearest point of origin. STA is a theoretical exercise based on hypothetical suppositions about the likely maximum distance of daily travel and transport and the likely distribution of past subsistence resources. SCA is a more strongly empirical exercise dealing with the nearest most likely source of materials actually present in the archaeological deposit. Moreover, a site can have different sorts of catchments. In practice, the economic catchment may turn out to be smaller or larger than the hypothetical exploitation territory, or to comprise different-sized catchments for different food resources. We can also imagine other sorts of catchments—for example 'geological' catchments comprising sources of raw materials for making stone artefacts or ceramics. Most early examples of SCA are in fact exercises in STA, and in this form they serve two purposes. First, they result in a more fine-grained examination of environmental variability in relation to archaeological sites. Earlier inferences about economic function relied on the environmental zones within which sites occur, disregarding the fact that it is often local variation that is of human interest—the oasis in the desert, for example—or on questionable assumptions about the function of artefacts or the completeness of archaeological food remains. Second, they stimulate new hypotheses about the likely economic practices carried out at individual sites, and suggest new lines of research and relevant test data. These in turn demand improved techniques of recovering faunal and floral remains from archaeological deposits, and more careful analysis of the differential processes by which such materials were collected, transported, discarded, incorporated in archaeological sediments and ultimately preserved or destroyed (*see* p. 121). In the ideal situation, the deductions drawn from STA—the off-site record—should be compared with the on-site record to see how far actual subsistence practices and site functions correspond to their environmental setting, leading to more subtle interpretations of the relationship between environment and economy Sites in unexpected locations, or having distinctive archaeological features and catchments compared to other sites in similar locations, might indicate use for purposes other than subsistence—for defence, for the procurement of valuable raw materials, for the control of trade routes or markets, for social aggregation or for ceremonial and ritual. These studies raise a number of questions, which have shaped subsequent directions of research. First, there is the accuracy of the time-distance factors used in defining SETs. Kent Flannery and his colleagues in their study of Mesoamerican early agriculture have identified the use of satellite camps to collect or partially process specific resources and transfer them back to the main residential base from distances well beyond the 10-kilometre limit. Strictly speaking, the satellites have their own SETs, but their effect is to extend the economic catchment of the residential base. Optimal foraging theory, which identifies the optimal relationship between the costs and benefits of different subsistence activities, has been used to define more precisely time—distance limits for different resources. Acorns are expensive to process but rich in calories, and it is worth carrying heavy loads long distances. Large animals are often butchered at the kill site to remove the waste parts of the carcass before carrying the meat back to camp, while small animals are carried back entire. Molluscs are easy to process but the high bulk of inedible shell can reduce the economical transport distance to figures well below the 5-kilometrethreshold, resulting in temporary sites for the removal of shells or consumption of the meat while out in the field. Intensive cultivation may confine the effective radius of exploitation to 1 kilometre or less. Water is the least transportable resource and proximity to water supplies rather than proximity to the principal food sources may be a key determinant of site location in areas where water is limited. This highlights a second issue, the assumption that use of a landscape is focused on discrete sites at the centre of their SETs, to which people return every night from daily subsistence activities. This concept stems from Central Place Theory, devised by geographers for the study of rural agriculture. While appropriate for abundant and immobile resources such as plant foods, which have to be brought back to a central point for processing and sharing, it is less appropriate for mobile resources. Derek Sturdy first demonstrated in 1972 that hunters of large herds prefer sites situated on the edge of extensive grazing basins circumscribed by topographic barriers. This allows the hunters to monitor and control movements of animals over large areas without causing them disturbance. The sites are thus asymmetrically located in relation to their principal resources, and control an extended territory that is much larger than the conventionally defined site exploitation territory. The concept is widely applicable to many Upper Palaeolithic sites in Europe, and is probably of utility in the study of all animal-based economies. Another problem with the central place concept is that many archaeological sites are probably not residential bases, but temporary locations used more or less fleetingly for particular tasks. This leads to a different approach, in which the distribution of key resources is mapped on a regional scale, and then compared with the distribution of archaeological remains using visual or statistical techniques. Such an approach avoids preconceptions about the function of individual sites or locations and highlights patterns of selectivity in the choice of some locations and environmental resources in preference to others. Then there is the question of how reliably we can reconstruct past environments from a study of present-day patterns. Climate and vegetation change, and soils and sediments erode from hill slopes and river valleys and are redeposited in lower valley basins or washed out to sea. Rivers can change course and wells and springs run dry. Even the topography of hills and valleys can change dramatically on the human time scale in areas of active tectonics. Palaeoenvironmental techniques such as analyses of lake and river sediments and pollen sequences are often conducted to study climate change, resulting in large-scale reconstructions rather than the local detail necessary for archaeological purposes. Here too the concept of catchment—the pollen catchment or the sediment catchment—has proved effective in adapting these techniques to finer-grained spatial reconstructions. Finally, there is the question of how reliably we can extrapolate present-day plant and animal habitats to the past. Modern red deer are confined to marginal woodland or moor, and ibex and chamois to high-altitude crags, where they have been driven by competition with domestic stock. However, prehistoric deer covered a wider range of wooded and open conditions, while ibex and chamois were found in rough terrain at any altitude. Technological change has also altered the potential of soils. Those most fertile for modern agriculture are often heavy soils that would not have been workable with hand tools in the Early Neolithic, when lighter soils were preferred. Often it is site catchment and site territorial analyses applied to archaeological sites and materials that have helped to identify these changes in the behaviour and economic potential of environmental resources.

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