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# L'outillage lithique en contextes ethnoarchéologiques

## Lithic Toolkits in Ethnoarchaeological Contexts

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Xavier Terradas



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# STONE TOOLS IN ETHNOARCHAEOLOGICAL CONTEXTS: THEORETICAL-METHODOLOGICAL INFERENCES<sup>1</sup>

Ivan BRIZ, Ignacio CLEMENTE, Jordi PIJOAN, Xavier  
TERRADAS & Assumpció VILA

Resume: Avec ce travail nous faisons une revision critique de l'utilisation qu'on a fait des donnees ethnologiques en la recherche des societes prehistoriques et l'etude de son outillage lithique. A partir de cette revision, nous remarquons l'inutilite des analogies ethnographiques fonnelles, etant donnee son incapacite de generer des explications sur la causalite des ensembles de restes lithiques.

De cette fayon, nous faisons une contre fonnullation de la recherche ethnoarcheologique dirigee li l'obtention d'une methodologie archeologique, ajustee li l'etude de la dynamique socioeconomique des societes prehistoriques. Dans ce sens, la recherche ethnoarcheologique que nous venons developpe sur des societes de chasseurs-cueilleurs de la Terre du Feu en Argentine nous a pennis de constater la manque de signification sociale des categories morphologiques et technologiques habituellement utilisees dans les analyses archeologiques des ensembles lithiques. Finalement, nous proposons des differentes categories d'analyse afin de pouvoir detenniner les objectives de la production, en reconstruisant et caracterisant les strategies developpees en la gestion des ressources minerales en vue de la manufacture de l'outillage lithique et des autres biens de consommation. L'interaction des differents elements de la production nous donne la possibilite d'accès li une dimension dynamique et economique du developpement de ces strategies et de leurs resultats materiels.

Abstract: We present a critical review of the use which ethnological data has been used for the study of prehistoric societies and stone tools. In this sense, we note the uselessness of formal ethnographic analogies, in view of their incapacity to generate explanations for the causality of lithic assemblages. In this way, we claim a new formulation of ethnoarchaeological research, focused on developing an archaeological methodology conforming to the study of the socio-economic dynamics of prehistoric societies. Thus, the ethnoarchaeological research we are developing with hunter-gatherers societies from the Tierra del Fuego archipelago (Argentina) pennit us to corroborate the lack of social significance of the morphological and technological categories that have been typically used in lithic analyses. It is for this reason that we propose different analytic categories which allow us to detenninate the goals of lithic production and, at the same time, to reconstruct and characterize developed strategies in mineral resource management for the production of stone tools and other consumer goods. The interaction between different elements of production makes possible an economic and dynamic approach to the development of these strategies and their material effects.

## INTRODUCTION

Traditionally, prehistoric archaeology has concentrated most of its attention, and consequently most of its studies, on assemblages of lithic remains, considering them to be a key element to improve our knowledge of the oldest phases of prehistory. The study of these remains has been given so much importance for two reasons: firstly, because of their constant and abundant presence in the archaeological record, due to their mineral nature, which is more resistant to the processes of post-depositional destruction and alteration and secondly, because of the markedly positivist scientific spirit of the early 20th century, which reduced archaeological studies to the so-called material culture. This reduction of the object of archaeological study meant

that attention was even more centred on lithic remains, which was identified as a defining element of prehistoric cultures.

This exaggeration of the importance of lithic remains did not favour the development of suitable methodologies for their study and interpretation. Interest was centred on the description and search for formal similarities and differences among the different elements that made up lithic assemblages in order to create subgroups which could be related to social, chronological and ethnic entities. The parameters that determined formal recurrences were exclusively based on those pieces that had undergone a modification of their original morphology through retouch. These retouched remains were awarded the category of tool, based on the supposition that greater formal complexity implied greater technological complexity. As a result, a series of periodisations were established founded on a variety of typologies of the supposed tools and groups of tools (e.g., MERINO 1994). In the beginning this was based on the index fossil approach and later on the identification of the internal homogeneity of lithic assemblages within which the different types are represented in recurring proportional and previously fixed intervals.

The names used to identify the different types of tools (scraper, burins, knives, etc.) allow us to see how the

<sup>1</sup> This denomination includes a large number of mineral remains generated in the production of consumer goods. These goods may have a wide variety of functions, pennitting a human group to produce and maintain the conditions that pennit their biological and social reproduction due to their participation:

- As products related to subsistence, both as construction materials by being part of walls, windbreaks, paved areas, fireplaces, etc. and as heat accumulators and diffusers, or as containers, among other uses.
- As products related to social identification: adornments, insignias, images, etc.
- As tools that unlike those mentioned above, pennit the production of new consumer goods through the transfonnation of raw materials of all kinds. In this paper, we will deal with the latter.

hypothesis of use based on shape made an unjustified leap of inference to become a categorical statement of fact. The use of ethnographical analogies played a leading role in the creation of this nomenclature. Scholarly opinion happily moved from the formal comparison of archaeological lithic remains and their use by societies that utilised stone tools to the identification of functionality through the assimilation of their shape. The next inferential step was the association of current socio-economic models with those of prehistory.

Having said that, there were alternative proposals regarding the study of the function of lithic tools such as that put forward by the Soviet researcher S.A. Semenov from the perspective of historical materialism (SEMENOV 1957). This approach was either not taken seriously in the West as it clashed with the dominant academic theory, or devalued by considering the function of tools as just one more detail to be added to the existing typologicalists.

### ETHNOGRAPHICAL ANALOGIES

As we have mentioned above, ethnology was used as a justification and analogy as an instrument to propose a paradigm in order to recognise cultures for prehistory. But these affirmations went far beyond everything that ethnology and anthropology identified as defining traits of a culture. They even contradicted what is normally considered to be cultural.

From an ethnological point of view, we will see that a human group is never defined or characterised by the technological development that it achieves, let alone by the sum of the morphologies of their tools. What defines the identity of a human group is its specific social organisation for production and reproduction, which is the result of its historic development. Specific strategies for biological and social reproduction present at a given moment are what allow us to describe a group and differentiate it from others, whether they are contemporary or not. The concept of organisational strategy refers to the execution of an articulated and planned series of processes (established, regulated and determined socially) that govern the productive and reproductive activities of societies (TERRADAS 1998; 2001). As its name indicates, the term we have used to describe this concept implicitly includes strategic (its objective is the achievement of a goal) and organisational (its planning and execution is indicative of an organised structure) qualities.

It is in this context, and more specifically within the area of organisational strategies that affect the management of mineral resources, that the production of lithic tools should be understood as an intermediate element; a medium by which to carry out a series of necessary tasks within the strategies mentioned above, and it can never be interpreted as an end in itself. Technology is, therefore, the material expression (as far as the development of work processes is concerned) of the hierarchically ordered strategies of production and reproduction implemented by the social group. It is from this perspective that the study of lithic remains reveals all its interest and inferential potential: in

the understanding of how and why the specific strategies of the production process have been designed and developed, and in the identification of their material manifestations, which are an indispensable element in order to be able to describe both the social character of the group and its historical development.

In this framework, neither ethnology nor anthropology was able to provide answers about how to approach the study of lithic remains in archaeology. Their artificial and extreme division into two disciplines depending on the different objects of study, forgetting that they shared the same final objective, made it difficult to achieve the synthesis that could have helped to overcome the problem. Consequently, ethnological and anthropological monographies are used as a basis from which to make direct analogies. This mechanism is limited to showing the plausibility of the hypothesis made by the archaeologist by finding a real case in some anthropological document, which proves the hypothetical proposal. In this way great inferential leaps continue to be made that lead to a situation in which, with the same accurately studied data, such different interpretations are made that they may even be contradictory.

### INSTRUMENTAL ETHNOARCHAEOLOGY

During the 1960s the axiom that archaeology (understood to be the scholarly study of prehistoric material remains) was unable to explain the social aspects arising from the remains that it discovered because social organisation did not itself leave any material remains. As a result, ethnology was increasingly used to provide interpretations in prehistoric archaeology; but this time the shortcomings of ethnology were to be resolved.

The proposal was to take an archaeological look at ethnographical societies; in other words, to take into account the material aspects and results of the way humans behave in their daily lives. This is what would be known as ethnoarchaeology. It was not yet a sub-discipline, but under this title different approaches and practices were put forward which received names such as *active archaeology*, *living archaeology*, *ethnographic archaeology*, among others. It was not until the end of the 1970s that the name ethnoarchaeology gained general acceptance, above all within the so-called new archaeology and middle-range theories (BINFORD 1972; 1978; 1983). In this way, the study of present-day primitive peoples was developed in order to have analogies that could be useful to understand the way of life in prehistoric times, although this did not imply the discovery of global explanations for the processes of change that these prehistoric societies had undergone.

Having said that, the concept of ethnoarchaeology can be interpreted in different ways. Perhaps the only feature that they have in common is the establishment of some kind of link between archaeology, ethnology and cultural anthropology. All these disciplines succeeded in making the use of ethnographic analogy more sophisticated and better. At the same time, it showed the flaws in many

archaeological practices while improving methods for recovering remains and generating data. However, they did not succeed in improving the explanations originating from archaeology. In other words, not a single genuine change took place that would allow it to enlarge its scope as a science, while continuing to generate ethnographical analogies (albeit more rigorous ones) for the study of prehistoric societies.

Also within this context, but from archaeological research, there emerged the so-called *paleoethnography* or *French prehistoric ethnology* (KARLIN *et al.* 1992), whose most significant representative is A. Leroi-Gourhan (1964; 1965). Along with J. Tixier, this author formulated in the 1960s the concept of *chaîne opératoire* as a research tool to be used in the study of the production of stone tools. This concept was a development of the study of technical processes carried out during the 1950s by French cultural anthropologists like M. Mauss and M. Maget, and is widely known and used in European prehistoric archaeology, being present in the vast majority of work on lithic tools (for example, in Spain: MORA *et al.* 1992). These works adopt the practical categories established by the *chaîne opératoire*, while omitting the implicit theoretical assumptions (PIE & VILA 1992).

## ETHNOARCHAEOLOGY IN ARCHAEOLOGY

One important fact was missing from all these proposals which emerged during the 1960s, and it is that ethnoarchaeology allows one to work in archaeology without using ethnographical analogies. Our ethnoarchaeological proposal involves, first of all, understanding it as a resource with which it is possible to contrast archaeological methodologies. In other words, to contrast the validity of the methodology with the plausibility of the information which is supplied (ESTEVEZ & VILA 1998). We need to check that archaeology itself, with the methods and techniques that it is developing nowadays, is able to answer the questions about social dynamics (ARGELES *et al.* 1995; ESTEVEZ *et al.* 1998; RUIZ & BRIZ 1998; VILA & RUIZ 2001) and, if this is so, evaluate this explanatory potential and the limits of its application. In this way, we aim to evaluate the possibility of obtaining truthful knowledge about the origins of human societies, their internal dynamics and their historical development. With the results from this contrastive analysis, we will be in a position to discover the shortcomings of current archaeological methodology and we will know what approach to use in order to correct them.

Ethnoarchaeology, therefore, as we see it, should put archaeological methodology to the test in order to achieve an appropriate methodological framework for the study of the socio-economic dynamics of prehistoric societies (ESTEVEZ & VILA 1995b; 1998; VILA & PIANA 1993). This contrastive analysis would have an impact on everything for the very notion of archaeological record to the methods and techniques used in their recovery, including its epistemological foundations, and would be carried through the dialectical contradiction between the

different types of sources, within a system of hierarchically organised terms (VILA & ESTEVEZ 2001).

We can currently state that the theoretical and conceptual framework of normative archaeology is not useful for describing social organisation properly. In relation to the issue that we are dealing with here, groups of lithic remains, in order to affirm this uselessness we could take as a starting point the lack of any link between the typological classifications used and the social dynamics of production of the past. The typological proposals are a classificatory system, not a means of interpretation. On the other hand, ethnoarchaeology, as we have described it above, shows us that these remains can give us relevant social information if we make use of suitable categories and significant and adequate associations. Although it has not been developed exclusively for the study of stone tools, ethnoarchaeology should allow us to see the most valid variables in the study of lithic remains, depending on how much they contribute to the general objective we are pursuing.

In the course of the ethnoarchaeological projects we are working on in Tierra del Fuego, Argentina (ESTEVEZ & VILA 1995a; 1998; PIANA *et al.* 1992; VILA *et al.* 1998) we have carried out archaeological excavations at a number of different settlements: *Tunel VII*, *Lanashuaia* and *Alashawaia*, all of which were occupied several times when the indigenous societies came into contact with the new European settlers. These sites are located on the northern coast of the Beagle Channel (Figure 1), although they are situated in different environments and may present regional differences of a quantitative nature due to the availability of natural resources. Thanks to the large amount of ethnohistorical information available, we know that these places were occupied by the same group of hunter-gatherers called the *Yamana* by ethnographers. This information, of a widely varied nature and significance, is what allows us to answer certain questions that we wished to pose from the perspective of prehistoric archaeology.

The study of these archaeological remains has allowed us to confirm the uselessness of formal and technological categories for an interpretation from the perspective of social archaeology (CLEMENTE 1997; CLEMENTE & TERRADAS 1993; CLEMENTE *et al.* 1996; MANSUR & VILA 1993; TERRADAS 1997; 2001; TERRADAS *et al.* 1999). These categories not only fail to contribute to knowledge about production, they also isolate tools from the social context that generated them and which give them meaning. It is very clear that they are not suitable for describing groups.

If we were to study the lithic remains of these sites using the parameters of the classical typologies, we would separate them culturally according to: typological level, proportions of raw materials, methods and techniques of manufacture, and the relative uses that they represent. This shows the unsuitability of the parameters of historical-cultural archaeology to classify human groups according to lithic typologies. This should tell us that what defines a social group is something much wider. It is obvious that if we wish to extract information from these sources, we

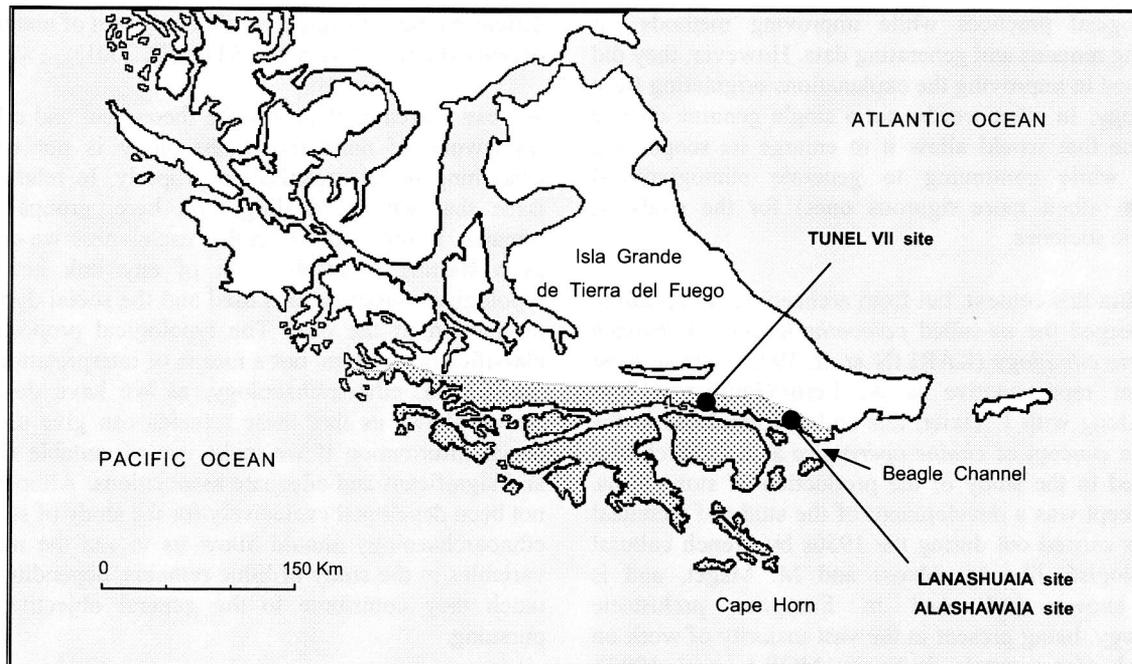


Figure 1: Geographical map of the Tierra del Fuego archipelago (Argentina-Chile) with the distribution of *Yamana* people (shaded area) and the location of archaeological sites mentioned on the text

must develop suitable methodologies that provide us with reliable information. This information should link up with other elements that make up archaeological record.

### CATEGORIES OF ANALYSIS

The study of lithic remains should match with archaeological knowledge of the social dynamics of global production and reproduction. Consequently, we need radically different categories to those which are normally used, as well as a different hierarchical order for them as well.

We know that lithic remains recovered from a socially significant unit of observation (occupation floor, layer) are the result of either work processes related to the manufacture of stone tools, or of the use of the latter in other processes linked to the production of new consumer goods. Taking this fact as a starting point, the element on which we construct the hierarchical order of our study proposal is the identification of the stone tools, which is the main objective of the lithic production process. This is why we need prior identification of those lithic remains that have been used in later productive activities, which we will refer to as **tools**. These tools permit the production of new consumer goods through the transformation of raw materials of all kinds. This permits an increase in human productive capacity by raising the energy level of a person's labour beyond his or her physiological limitations (LUMBRERAS 1981). The importance of their study comes from the possibilities that this offers to evaluate what level has been achieved in the development of the productive forces of a society, as well as the possibility to reconstruct the basis of its economic system, as they are its legacy (KOROBKOVA 1983).

On the archaeological level, tools can be recognised by means of the micro- and macroscopic alterations to their edges, ridges and surfaces, which are the result of their use on different types of material. Consequently, functional analysis is essential in order to identify tools and their role in the production process.

In the development of the lithic production process, and as a result of the manufacture of the desired products (tools), a waste number of products are derived. We shall divide these into rejects and by-products. A **reject** or rejected element is something that is surplus to the process of production and use of tools, which is voluntarily discarded. A **by-product** is something that is produced involuntarily during the creation of the desired product. These concepts will be defined by the objectives that drive lithic production and its use in each case (Figure 2).

As far as its archaeological recognition is concerned, a reject displays morphotechnical and morphometric characteristics that are very similar to those displayed by tools. The key element to distinguish between the two categories is some sign that the tools have been used in other activities that were productive. Rejects, despite their similarity to tools, were for some reason not integrated into other work processes. By-products can be identified by the fact that they display no sign of having been used nor bear any morphotechnical or morphometric resemblance to the other categories mentioned above. In optimal situations and depending on the time when these by-products were generated, it is possible to distinguish between production by-products (for example, a flake derived from the preparation of a striking platform, or a microflake obtained by retouch), and by-products of use (for example, those minute remains of the tool that have been chipped off during use).

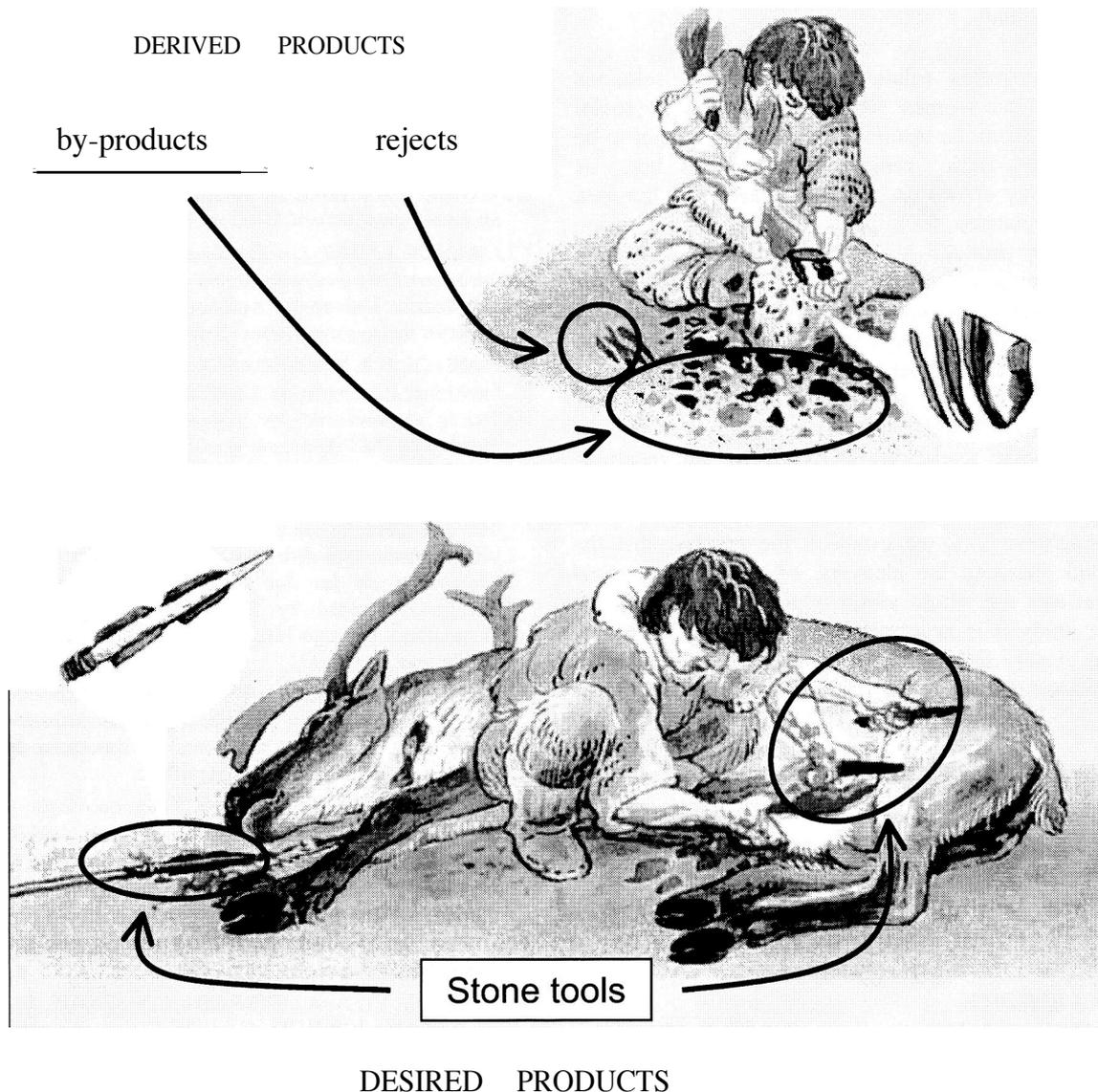


Figure 2: Simulated example with the proposed categories of analysis  
(elaborated by authors based on a drawing published by KARLIN *et al.* 1992)

The relevance of these categories is due to their usefulness, as they allow us to determine the objectives of production. In other words, they allow us to discover what products were in demand or, put another way, what consumer goods it was necessary to produce at a given time (specific utensils), as well as the needs that had to be addressed (specific use). In this way, we will be able to reconstruct and describe the strategies designed and carried out in the management of mineral resources for the production of lithic tools and other consumer goods. This is possible by studying the interaction of the different elements of production, which will give us access to a dynamic and economic dimension of the development of these strategies and their material results.

The development of these strategies involves the linking of different production processes, which cause constant and

progressive alterations in the raw material. This provokes a series of changes in its original properties and conditions in relation to both their spatial context and their volumetric and morphological characteristics. These alterations begin in the geological context from which the raw material was extracted in order to be incorporated into a socio-economic dynamic, and ends in the archaeological contexts from which the resulting effects of its transformation and use have been recovered.

At the same time, knowledge of the nature and availability of the different mineral resources which were available to the societies included in the study, should permit us to discover which likely alternative strategies to those that have already been archaeologically documented. The usefulness and profitability of the latter, in relation to the nature and availability of mineral resources, are elements that should allow us to obtain an idea about the degree of

technological development achieved by the societies included in the study.

The other categories relating to the social relations between men and women who produce, and as social agents, benefit from the results of production, are not to be found in the lithic remains themselves but, as ethnoarchaeology shows us, from an analysis of the area where these relations took place. As a physical space transformed by productive activities, the social space is considered to be a relevant analytical category, due to the fact that through its study it is possible to obtain information about the interaction between different social agents and collectives depending on the kind of activities that were linked to production, distribution and consumption (WÜNSCH 1995). It is equally possible to identify the basic tendencies that govern the resulting logistical strategies, based on the conditioning and cleaning of the area transformed by the social activity. In order to achieve this, we establish the premise that the spatial link between the elements of the archaeological record reflects the whole group of activities carried out. For their study it is necessary to design a methodology, which is closely linked to the analysis of the empirical record and based on the application of qualitative methods.

## Authors' addresses

I van BRIZ

Consejo Superior de Investigaciones Científicas (CSIC) Laboratory of Archaeology - Inst «Milfl i Fontanals» Egipcíiques, 15. 08001 Barcelona? SPAIN  
e-mail: ibriz@bicatcsic.es

Ignacio CLEMENTE

Consejo Superior de Investigaciones Científicas (CSIC) Laboratory of Archaeology - Inst «Milfl i Fontanals» Egipcíiques, 15.08001 Barcelona, SPAIN  
e-mail: ignacio@bicatcsic.es

Jordi PIJOAN

Universitat Autònoma de Barcelona  
Departament d' Antropologia Social i Prehistòria Facultat de Lletres - Edifici B. 08193 Bellaterra, SPAIN e-mail: jordi.pijoan@uab.es

Xavier TERRADAS

Consejo Superior de Investigaciones Científicas (CSIC) Laboratory of Archaeology - Inst «Milfl i Fontanals» Egipcíiques, 15. 08001 BARCELONA (Spain) e-mail: terradas@bicatcsic.es

Assumpció VILA

Consejo Superior de Investigaciones Científicas (CSIC) Laboratory of Archaeology - Inst «Milfl i Fontanals» Egipcíiques, 15.08001 Barcelona, SPAIN  
e-mail: avila@bicatcsic.es

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