

 Open access • Journal Article • DOI:10.1017/S0003598X0003948X

## **Chronicles of 'Ona-Ashaga': archaeology in the Beagle Channel (Tierra del Fuego - Argentina)+ — [Source link](#)**

[Ernesto Luis Piana](#), [Assumpció Vila](#), [Luis Abel Orquera](#), [Jordi Estévez](#)

**Published on:** 01 Sep 1992 - [Antiquity](#) (Antiquity Publications)

Related papers:

- [Archaeological analysis of shell middens in the Beagle Channel, Tierra del Fuego Island](#)
- [Composición de conchales de la costa del Canal Beagle \(Tierra del Fuego, República Argentina\)](#)
- [Littoral adaptation at the southern end of South America](#)
- [Los lobos marinos como recurso para cazadores-recolectores marinos: El caso de tierra del Fuego](#)
- [Encuentros en los conchales fueguinos](#)

Share this paper:    

View more about this paper here: <https://typeset.io/papers/chronicles-of-ona-ashaga-archaeology-in-the-beagle-channel-10z5n3khwo>

# Chronicles of 'Ona-Ashaga': archaeology in the Beagle Channel (Tierra del Fuego – Argentina)<sup>†</sup>

ERNESTO PIANA, ASSUMPCIÓ VILA, LUIS ORQUERA & JORDI ESTÉVEZ\*

Since the 16th century, contact with people looking and living very differently to themselves has provided Europeans with a sort of mirror. The image reflected in it serves to illustrate at any moment current philosophical ideas about the nature and evolution of mankind. Europeans were not therefore really concerned with explanations for what they saw but instead limited themselves to ethnological speculations.<sup>1</sup> Nowadays, ethnographic field work is no longer possible (ethnological analysis must seek new insights in old writings) and archaeological research is justified for three reasons:

- 1 From the point of view of people living in those territories today it is important to know the past and therefore to recover the history of the aboriginal groups who inhabited their present countries. The aim is to study their process of adaptation and through archaeology to expand and contrast the ethnographic record.
- 2 From a more general approach within archaeological research it is important also to analyse and understand the adaptive mechanisms and responses of subsistence economies to littoral environments.
- 3 Finally, for European archaeologists, the archaeological study of recent hunters

could usefully throw light on their own research which lacks an ethnographic dimension.

Let us now examine some of these points in more detail.

## The *Yamana*: past and present views

### *Silencing their voices*

In the 16th century, when Europeans arrived, the South American territory southward from 34°S and 42°S latitudes – on the eastern and western sides of the Andes range respectively – was inhabited by nomadic hunter-gatherer groups with a simple subsistence economy whose environmental adaptation patterns differed. Their relationships with Europeans were very diverse. Some of those groups, the *Aonik'enk*, first called Patagones, played a notable role in the scientific folklore of the 17th and 18th centuries, because of stories about their supposedly enormous height. Others, such as the northern Tierra del Fuego *Selk'nam* (Bridges 1947; Gusinde 1931), were thought in this century to be representative of a presumed pristine hunter way of life. The sea-canoe aborigines (the *Yamana*, who lived in a region from the Beagle Channel to Cape Horn) and the improperly named *Alacalufes*, who inhabited

† We thank Mercedes Piana for the translation of the first part. Walking alone one evening through the forest along the old track, hearing the howls from the 'lengas' tree shaken by the wind, and after some days working in the site I felt unhappy. People were missing but still so close. I remem-

bered the sensations produced by the tales in a book read many years ago in my adolescence. The title we choose here evokes it partially. (JE)

1 Here 'speculation' is understood as inaccurate management of data.

\* Ernesto Piana, Centro Austral de Investigaciones Científicas, Avda. Malvinas Argentinas, Ushuaia, Argentina. Assumpció Vila, Consejo Superior de Investigaciones Científicas, C/Egipcíacas 15, 08001 Barcelona, Spain. Luis Orquera, Consejo Nacional de Investigaciones Científicas y Técnicas, Rivadavia, 1379, Buenos Aires, Argentina. Jordi Estévez, Universidad Autónoma de Barcelona, 08193 Bellaterra, Spain.

both sides of the western entrance to the Magellan Strait, played – though without realizing it – an important role in what Europeans understood as pristine savagery.

The ethnic existence of these groups ceased at the beginning of this century. Their end was caused by different but concurrent factors. During the last quarter of the 19th century, a double expansion of Criollo-European societies took place in Pampa and Patagonia. As always happens when pastoral fronts advance (Ribeiro 1971: 64), the conflict with the natives was violent. They were swept out of the land now devoted to cattle breeding to prevent them from hunting stock. Military campaigns ejected semi-sedentary farmer-pastoral Araucanian and Araucanized groups from the Pampean plains. Having been debilitated by alcohol long before, the *Gününa-kene* and the *Aonik'enk* were also affected despite their traditional friendly relationship with Spaniards and Criollos. Even though these events occurred far from Tierra del Fuego and had no direct effect on it, they further strengthened an already very negative stereotype of the aboriginal way of life. This prejudice was used as an ideological excuse for colonial action.

In the south, around Punta Arenas, there was a boom in sheep-rearing in the 1880s. This was not accompanied by military campaigns but took the form of shooting, poisoning and imprisoning *Selk'nam*, *Yamana* and *Alacalufes* (Gusinde 1931; 1937; Martinic 1973). Later, bloody internal conflicts broke out among the *Selk'nam*, probably under the stress of territorial compression. The *Alacalufes* had to tolerate the presence of outliers displaying the more negative features of European-Criollo expansion. In the *Yamana* portion of Tierra del Fuego this was mitigated with the establishment of the Anglican mission and an Argentine navy post in the Beagle Channel. Years after the missionaries became landlords but their paternalistic, protective attitude towards the aborigines survived. However, imported European diseases wrought havoc throughout the region, since the aborigines had no natural immunity against them.

At the beginning of the 20th century fewer than 200 *Yamana* (Gusinde 1937: 221), fewer than 1000 *Alacalufes* (Martinic 1989) and a larger but unknown number of *Selk'nam* (Gusinde 1931: 132) remained alive. Twenty

years later, when visited by Gusinde, their number had been drastically reduced to 70 *Yamana*, 300 *Alacalufes* and a similar number of *Selk'nam* (including *mestizos*). By this time, only shreds of their traditional way of life remained. Later, it was only possible to explore the dim memories of some survivors (Emperaire 1955; Chapman 1982; 1989; Stambuck 1986). Nowadays, even that path is finally closed. Descendants – no more than a handful of each group – preserve a wounded pride in their aboriginal ancestry but have no other memories than those of living submerged by and subjected to the Argentine and Chilean cultures and societies. In this respect, Tierra del Fuego differs from Australia or South Africa: aboriginal societies have disappeared and only archaeology or new studies of old writings can provide new insights.

The independence of Argentina and Chile from Spain was proclaimed during the second decade of the last century. Since the mid 19th century, government élites in these countries have strongly favoured Eurocentric ideologies which reinforced a negative stereotype of the aboriginal groups. As a result their characteristics and differences were ignored. Distance and difficult communications exacerbated the lack of interest of both national societies in the southern aboriginal survivors. Native societies were judged in colonialist terms, a feeling of superiority and estrangement. Though they are now disappearing, such attitudes arise from ignorance rather than prejudice. Anthropological investigations have even occasionally evoked some popular interest. Since Tierra del Fuego was settled only very recently by Europeans and Criollos (some 90,000 people in 1989 in both the Argentinian and Chilean parts), the aboriginal culture is used both in a 'search for identity' and to give a picturesque image (e.g. aboriginal words are used to name people, streets, schools, shops, pubs, clubs, pets, etc.). Nevertheless, in these countries official education pays little attention to pre-European cultures. There is no indigenist feeling such as exists in Mexico or Peru. Descendants of the aboriginal groups are not powerful (especially those from the southernmost end, since they are very few in number). Academic studies conform with the characteristics of 'Colonialist Archaeology' described by Trigger (1984): facts are studied

only because they are interesting, the researcher remaining detached from them.

Regrettably, the aborigines of Tierra del Fuego cannot speak about their past with their own voices. Our view of them is dominated by academic approaches. When Europeans arrived the *Selk'nam* (foot-guanaco hunters) protected themselves by a strategy of concealment; moreover, the coasts of their lands were unattractive to European sailors looking for the Magellan Strait or Cape Horn passages. As a result, they remained almost unnoticed until the very beginning of their massive extinction. On the other hand, the *Yamana* and *Alacalufes* were often being studied when the concepts of Evolutionism and Primitivism were being developed. The rest of this paper will be devoted to them.

#### *Images in a mirror: the academic viewpoints*

Two concepts seemed to have predominated for a long time so far as the sea-canoe groups were concerned: *Cornering* and *Primitivism*. A third idea sometimes emerged from them: the shallow time-depth of the area (Piana 1984; Orquera *et al.* 1984). The first concept can be traced back to the Forsters. There were naturalists with Cook on his second voyage. Unfavourably impressed by a landscape very different from that of Polynesia, where they had just been, and by the *Yamana's* apparent indolence, George Forster (1777: II, 505) thought that the *Yamana* could be

the miserable out-casts of some neighbouring tribe, which enjoys a more comfortable life; and that being reduced to live in this dreary inhospitable part of Tierra del Fuego, they have gradually lost every idea, but those which their most urgent wants give rise to

(see also John Forster 1778: 313). The *Cornering* concept lasted for a long time and has unexpectedly reappeared in recent literature (e.g. Harris 1977: 50).

The second concept, *Primitivism*, has its origins in the pejorative approach to the Fuegians adopted by the English travellers of the beginning of the 19th century. According to King (1839: 24), at first sight the *Alacalufes* seemed to be not very far removed from animals; a similar prejudice flows from Fitzroy's (1839) and Darwin's (1839) descriptions. Their extraordinarily simple technology, their almost complete nakedness despite the

rough weather, the absence of developed social structures, the apparent lack of private property all conspired to put the *Yamana* and *Alacalufes* on the lowest step of Mankind. It was not an evolutionist but rather a ranking concept: the use of the 'natural system' arrangement that was common in the 18th century (Toulmin & Goodfield 1968) and wholly compatible with Creationism. However, when, 15 years after his visit to Tierra del Fuego, Darwin introduced the concept of evolution, the Fuegians provided the best example of an unchanging link in that developmental process. Thus, according to Lubbock (1865: 408) they were living fossils which were to anthropologists what marsupials were to palaeontologists: illustrative of archaic ways of life that for whatever reason would have remained static without developing.

The observations made by Bridges and by the *Mission Scientifique du Cap Horn* (1882–83) (Martial 1888; Hyades & Deniker 1891) did not see the Fuegians as living fossils, but the *Primitivism* concept appeared again in the early papers of Gusinde (1924; but not in 1937) and in Imbelloni (1947), although these authors were ideologically at the opposite extreme from *Evolutionism*. In a rare case of *cultural mechanism*, Imbelloni combined *Primitivism* with *Cornering*. According to him the *Yamana* and *Alacalufes* represented the earliest wave of the peopling of America, swept to its southernmost end by pressure from culturally more dynamic later waves. Much later, Menghin (1960) improved on this scheme:

- 1 Fuegian survival was paradoxically explained by the harshness of the environment (so hostile that it would have preserved them from the territorial ambitions of neighbouring groups);
- 2 Unlike Gusinde and Imbelloni, who considered that *Yamana* and *Alacalufes* had a steady past, a story *without history*, Menghin postulated a history with important transformations. The Fuegians came from the creators of an ancient industry that he thought he had identified in Continental Patagonia: the *Riogalleguense*, characteristic of 'lower hunter-gatherers' with a technology comparable to that of the European Middle Palaeolithic. Having been pushed out of Patagonia by 'upper hunters', these 'lower hunter-gatherers' had to settle on the coast

where they adapted their behaviour to that new environment and received some 'influences' from their victorious neighbours. This led to slight improvements in their technology.

It is obvious that these concepts belong to the models of migratory waves and cultural loans that were in fashion until the 1950s; and it is also obvious that they were speculations based on ethnographic extrapolations and (in Menghin's case) unverified interpretations of archaeological data. These interpretations would have required archaeological testing, but Imbelloni did not take into account Bird's (1938) pioneer work, although it had been published 10 years before his own theory. Menghin, however, did use those data. Bird had suggested that the area would have been peopled not more than 2000 years ago; Menghin agreed with him and bypassed the disagreement between Primitivism and late settlement by regarding 'primitive characteristics' as representing the conservation of features that were archaic in other areas.

When the Englefield site was excavated (Emperaire & Laming 1961), the results were so much at variance with that concept that they were not understood and no importance was accorded to them. Criticism did not begin until the 1970s, when Oritz Troncoso (1975; 1980) excavated the Bahia Buena and Punta Santa Aña sites on the Magellan Strait coasts and when a research project on the Argentine coast of the Beagle Channel began. The latter – which is still in progress – has already studied Lancha Packewaia (Orquera *et al.* 1977), Túnel I (Orquera & Piana 1988a; 1988b; Orquera *et al.* 1984 (ms); Piana 1984; etc.), Shamakush I and X, Túnel VII and other sites. While there is still much to be analysed and investigated by archaeological means, we can nevertheless discard the old concepts. There was never any cultural Primitivism, Cornering or late settlement.

*Listening to the soil: the present archaeological viewpoint*

Several <sup>14</sup>C dates from Túnel I indicate that a life-style based on a high dependence on littoral resources – very similar to that of the Yamana – is at least 6500 years old. There are reasons to believe that much older dates are unlikely to be found for this tradition (Orquera & Piana

1988a). The Chilean sites of Englefield, Bahia Buena and Punta Santa Aña display the adaptive features and are contemporaneous or slightly later (Oritz Troncoso 1980; Legoupil 1988). Later additional components continue to be introduced until ethnographic times and are even included in them.

The Cornering concept is neither justified nor explanatory. It originated in prejudices that are evident in Menghin's (1960) work and latent in all the previous writers: remoteness from the supposedly anthropodynamic centres and environmental harshness. However, there are several strong reasons to question whether diffusion of ideas or goods should have priority over the imperative needs imposed by the environment. Nor is this view as misplaced as that of Darwin and Menghin. In the Magellan–Fuegian channels and islands the weather is rough, cold, windy and very wet. But in no way does it match the extreme conditions of Cape Horn or the outer Pacific coasts of the islands. It is also true that steep relief and tangled unending woodland appear unattractive for human settlement since they provide few vegetable or animal food-resources. However, that fact is largely counteracted by abundant littoral resources: pinnipeds, molluscs, occasional stranded cetaceans, sea-birds, fishes, crustaceans, etc. (Orquera *et al.* 1984; Orquera & Piana *in press*).

Shellfish gathering has traditionally been considered a low-prestige activity compared with that of big-game hunters from steppe and savannah environments, with a low return rate and with poor chances for progress. However, Yesner's (1980; 1983) and Perlman's (1980) arguments – contrary to Osborn's (1977) – regarding the high profitability of littoral biota are convincing. Abundance, concentration, predictability and the diversification of resources provide enough food to support relatively dense populations with high mobility within small ranges.

In the last century, Yamana and Alacalufes based their economies on pinniped-hunting from bark canoes with detachable-point harpoons, shell-fish gathering and other activities. It is easy to understand the absence of canoe remains in the archaeological record, nevertheless we have argued (Orquera *et al.* 1984; Orquera & Piana *in press*) that it is almost impossible that 6000 years ago their ancestors

did not have them. The harpoon-point remains from that period are almost undoubtedly of the detachable type (Orquera *et al.* 1984; Orquera & Piana in press). Canoes and harpoons are hard-effort investments within a hunter-gatherer technology, since they represent time-consuming handicraft to be amortised in the long term. We still do not know why somewhere in southern Patagonia terrestrial hunting was replaced by pelagic hunting, despite its higher initial cost; but it was undoubtedly balanced by the high profitability and predictability of pinnipeds as a year-round staple (unlike coastal hunting, which does not require special technology but is only seasonal).<sup>2</sup> Moreover, the abundant blubber of pinnipeds and cetaceans furnished human beings with the calories required to overcome the higher metabolic needs for resisting cold, wind and humidity using only fire and flimsy huts and almost without clothes (Gusinde 1937; Orquera *et al.* 1984; Piana 1984; Orquera & Piana in press).

The Fuegian case should therefore not be considered Cornering to a marginal environment but a successful peopling of a potentially highly profitable habitat. In an area where agriculture was not possible (even nowadays it is difficult and scarce) the resource-risk optimization that led to a littoral adaptation was an alternative with profitable consequences.

In 1884 Bridges recorded 1000 living *Yamana*: approximately one per linear coastal kilometre. He estimated the population that he had seen 15 years before as 3000 persons (Hyades & Deniker 1891: 390; Bridges 1892: 317). One piece of information provided by Fitzroy supports this assertion: when Murray entered the Beagle Channel for the first time, he saw more than 100 canoes in a day (Fitzroy, in King 1839: 429); that means at least 400 persons in the surroundings of Ushuaia Bay. It is difficult to translate littoral linear densities into terrestrial area densities, but estimating the total surface of the *Yamana* region (including land and water, and ignoring the fact that mountains are not inhabitable) as some 21,600 sq. km, a population figure of 0.14 inhabitants/sq. km is reached. By comparison, in Continental Patagonia (800,000 sq. km), Musters (1871)

estimated 3000 Tehuelches, at a time when they had already been affected by alcohol but greatly favoured by having horses for hunting. Shortly before, Schmid (1865) had estimated their numbers as only 1000. In the Pampa (500,000 sq. km), before the post-Columbian settlement by farmer-shepherd Araucanians, there were barely a few hundred warriors (Falkner 1774). These people were being decimated by small-pox and fighting against the Spaniards, but at the same time they were deriving benefit from incipient cattle ranching. As a result, the aboriginal population density in the Fuegian channels and islands can be very conservatively estimated at about 30 to 40 times higher than those of Pampa and Patagonia. This result agrees with Birdsell's (1968) and Buchanan's (1988: 94) estimates of higher coastal densities in Australia and South Africa respectively. Of course, the prediction that a population nucleus will create or receive demographic pressures depends not on either absolute or density figures, but on the density/carrying-capacity relationship of the different habitats. When allowance is made for their low technological level, the argument that the clustered Fuegians had been cornered by them is unconvincing.

The simplicity of the material equipment used to face the harsh climate contrasts with hunting technology, and from a cultural-evolution viewpoint it may be used to justify Primitivism. In a wider context, however, this concept must be replaced by adaptation, and some of the arguments raised by Bargatzky (1984) must be considered. For example, it is surprising that the old concepts insisted on considering the *Yamana* and *Alacalufes* as representatives of the oldest population in America, without realizing that their material culture was developed to deal with very well-defined environmental conditions, completely different to those of the rest of the continent. One can disagree as to the extent of the changes or the accomplishment reached through their cultural evolution, but it is unquestionable that the life-style recorded by archaeologists and ethnographers was neither 'primal' nor typical of ancestors formerly living in other areas. Some day it will be possible to undertake comparative

<sup>2</sup> Unlike the Californian and South African cases analysed by Lyman (1989) and Buchanan (1988) and also Punta Baja (Legoupil 1989: 57–76), age-sex profiles and

seasonal distribution in the Beagle sites reflect sea-captures and not only captures in rockeries (Schiavini pers. comm.).

studies between, for instance, Tierra del Fuego and British Columbia, the Aleutians or the Baltic Sea Mesolithic, but they will not relate to genetically related phenomena or be manifestations representative of the same developmental stage as similar cultural adaptations

The simplicity of social organization underlined by all observers can be explained independently from the evolutionary standpoint. The southernmost end of South America is a belt of islands, channels and fjords with rough weather, but the proximity of a big ocean mass causes spatial and seasonal variations. Therefore, it is not a classic patchy environment. It is true that guanacos may be found on some islands and not on others; that fishing can be more productive at a certain season of the year, and that microtopographic features can modify the cost/benefit rates of exploiting key resources in different locations. However, in coastal areas it is possible to find most of the potential resources within a canoe/day mobility range. Following well-known models (Horn, applied and developed by Wilmsen 1973; Winterhalder 1981; Hefffley 1981; see a concurrent approach from a different starting point in Harpending & Davis 1977), an evenly-spaced resource distribution would favour human dispersion in the smallest viable social units, evenly spaced in tight proximity to each other and with high mobility within small ranges. This prediction fits the ethnographic record perfectly. As Yesner (1980: 720) pointed out, the high yield of the littoral environments and the ameliorating effect of the ocean mass explain the exception represented by the Yamana to Binford's correlation that storing and logistically-organized economies increase as effective temperatures decrease (Binford 1980: 16; but see also Keely 1988: 390).<sup>3</sup>

From a European perspective it is easy to understand why the simplicity of clothing used to face the weather negatively impressed the early observers, convincing them that the Magellan–Fuegian canoers lacked inven-

tiveness and creativity (Forster 1778: 313). This fact can, however, also have a functional interpretation: in a climate with almost incessant rains, the naked body dries much faster in front of a fire than any clothing. When, for moral and 'humanitarian' reasons the Yamana from Ushuaia Bay were obliged to wear European clothes, lung illnesses wrought havoc among them (Gusinde 1937: 304–6).

It is tantalizing that a littoral adaptation of over 6000 years (older than those of British Columbia, the Aleutians or the Arctic, and almost as old as that of the Baltic Sea) should leave so few essential changes in the archaeological record. It is true that guanaco consumption varied and cannot yet be interpreted; there were some technological improvements (the basal portions of harpoon ends were changed; in the Beagle Channel region bows and arrows with flaked-stone heads were adopted, etc.), but features such as careful stone-polishing, decoration of bone and other artefacts either decreased or disappeared in the later archaeological record. This does not allow us to talk about decadence or regression as Sutton (1982) did when arguing for his supposed Subantarctic Zone. Instead, the sequence gives the impression of a steady equilibrium around original resource exploitation patterns without any noticeable trend towards intensification.

Such stability led to what might be regarded as a cultural lag. In our opinion the cause would be the lack of internal or external selective pressures (Orquera *et al.* 1984; Orquera & Piana in press). We have already referred to the unlikelihood of the latter. Some arguments can be put forward in relation to the former. According to Heusser (1984: 66; 1989) the palynological record does not reflect any important changes over the last 6000 or 7000 years. It has also been pointed out that natural resources were sufficiently abundant to furnish the calories required to balance the demands of a dense but not numerous human population. Moreover, Schiavini (pers. comm.) determined that,

3 Although not of prime importance when measuring calories, shell-fish gathering played a 'security' role in traditional economies because they are predictable and dependable, requiring neither special technology nor skill. However, in the Beagle region molluscs are slow-growing, so a large group or a lengthy stay in one spot will over-exploit the resource. Again, incessant moving and small groups

preying at random on the resource was the best alternative. Extensive archaeological excavations identifying different refuse deposition events – such as the ones carried out in the Beagle Channel region – show very brief and repeated occupations on each site. Small test pits cannot trace the slight sedimentological differences among these events, producing a false appearance of lengthy stays.

in Túnel I occupations from 6500 to 5000 years ago, 85% of the pinnipeds consumed were males and only 15% were females: two-thirds of the former and one-third of the latter had not reached reproductive age. A similar structure was found at the Lanch Packewaia site by Saxon (1970).<sup>4</sup> Assuming pinniped polygamous behaviour, therefore, survival would not have been threatened by aboriginal hunting: the equilibrium in the resource could have been maintained without acute lasting stresses. By reason of these arguments and others (Orquera & Piana in press), the cultural simplicity found in the last centuries by European observers should not be attributed to Primitivism but to the lack of any need for more sophisticated tools. Of course, this interpretation still requires more thorough testing by further archaeological research.

### **Travelling back: why do we Europeans work in Yamana archaeology?**

#### *Some basic principles*

From the beginning, Palaeolithic archaeology paid close attention to hunter-gatherer societies. The need for objectivity, to consider other behaviour patterns to explain prehistoric societies, was at first obvious. Otherwise how could arrow points and knives be recognized and interpreted?

The first idea, the simplistic one of evolutionism, led to a search for contemporary referents for different evolutionary steps. Ethnological observations were directly transposed and illustrated with archaeological objects.

Criticism of this approach consolidated with the culture-history paradigm.<sup>5</sup> The concept of culture as a 'set of ideas' made this perspective especially descriptive. Variability in material culture was revealed by discoveries, contacts and migrations or by replacement by with people carrying ideas which gave rise to 'typical' objects. These latter movements are unpredictable, unavoidable and therefore regarded as incapable of explanation. However some explanation must be found for the 'generating

centres'. In the beginning this explanation was psychological and racist, and it was later polished by embellishment with other methodological alternatives. Later, after the apparent, or momentary, defeat in Europe of the most brutal forms of racism, it is camouflaged as environmental determinism.

In this paradigm objects do not have any significance except as a succession of markers for 'cultural groups', whose activities are practically unknown to us. To flesh out the skeletons it must either fall back on ethnography and/or on traditional sub-strata of ideas about those remote epochs (Stoczkowski 1990). Therefore this paradigm of culture history does not actually reject ethnographic information.

Naturally there are well-meaning people who specify ideal conditions and limits for the assembly of this Frankenstein's monster. Accordingly the best way to give life to the 'cold-data skeleton' is to be a good collector of ethnographic data that could be used in such a process.

The development of Positivism and Cultural Typology stimulated the gathering of 'all the data'. Here ideas about the past materialize in 'chains of gestures' that produce objects and other cultural features such as special spatial organizations and distributions. The result is often an attempt to typologize settlement forms. To achieve this, it was first necessary to adopt a different system of excavation – from the stratigraphic to the extensive area excavation.

Archaeologists, although rejecting on principle such cannibalizing of the ethnographic record, in most cases have no other alternative when it comes to interpretation of their excavated patterns. This can be clearly seen in hut reconstructions, which have recourse to little more than the 'traditional corpus of ethnographic wisdom'.

There is no doubt that this 'evolution' of traditional thinking is due, in part, to frictions with the 'New Archaeology', or, in general, with different concepts of culture or of the main object of archaeological study.

We do not want to deny the importance of 'New Archaeology' *sensu stricto* in the develop-

4 According to Schiavini this can be due to opportunistic hunting on a sex-age sample biased by the different intra-specific mobility ranges rather than to an intentional selectivity. Again the Beagle Channel case differs from that of the

Punta Baja site (Legoupil 1989).

5 We refer to it as the Orthodox Archaeological System (OAS) for its practice or Canon Archaeology for its claims.



ment of archaeological theory in Europe. We believe that its most relevant contribution was to explain the assumptions implicit in the traditional paradigm. Although the 'Orthodoxy' has reacted by trying to ignore, by trying to reconcile (by juxtaposing) works or by producing Post-modern Archaeology (a typical product in our view of the 50s Retro-Fashion),<sup>6</sup> the need to look differently at the archaeological evidence becomes clear. When defining the object of study the relationship between the ecological, economic and social spheres, articulating in different ways following the different theories, must be considered.

Since the New Archaeology, the study of ethnographically documented societies has had three fields of application (Watson *et al.* 1971):

- 1 direct analogy, concerning only ancient people directly related to living groups.
- 2 a heuristic procedure for the generation of hypotheses to contrast.
- 3 an experimental method for generating Middle Range Theory (MRT) by observing living systems in order to interpret the static systems produced by those acting in the past (Binford 1977 & 1978).

How does our position differ in relation to the use archaeologists make of the ethnographic record? The distance from the Watson *et al.* scheme arises from our different theoretical positions. Briefly, and following Gándara's (1982) characterization of the New Archaeology:

- 1 we do not start from Hempel's Knowledge Theory but from the theory of the dialectic (see Lefebvre 1969; Zeleny 1969 etc.).
- 2 we do not conceive of archaeology as anthropology but as archaeology.<sup>7</sup> We would agree, although with some differences that will appear in what follows, with the two other points made by Gándara (1982).<sup>8</sup>

#### *Some theoretical points:*

Much attention has been devoted to the devel-

opment of techniques that inform about and evaluate the relationship between prehistoric societies and their environment. The goal has been to represent past habitats and subsistence systems, sometimes improperly called economy.<sup>9</sup> But little advance has been made with regard to social organization, which we consider fundamental in our approach to history. This methodological 'impasse' has produced homogeneity in Palaeolithic research standards, for example excavation methods and specialist studies. Indeed, we must assume that the lack of conclusions does not arise from the actual lack of data but from the requirements of extractive methodology.

Assuming the organization of space<sup>10</sup> to be correlated in some way with social organization, we have to choose the level and variables most appropriate to verify this correlation, i.e., to proceed to the development of instrumental concepts needed to get out of the interpretive jam.

#### *Regarding space*

Positivist approaches have dealt with spatial distributions, offering us a series of pretty postcards of huts and descriptions of settlements and the supposed spatial distribution of activities.

One other approach, Palaeoethnology, claims in some cases to transcend pure description by correlating it with a kind of social organization (Pigeot 1987). To do that, it claims to start only from the archaeological record but in fact it takes experiences from experimentation and ethnographic analogy, albeit implicitly (Julien *et al.* 1987).

Another approach (which might be called 'In Pursuit of the Middle Range Theory') attempts to establish correlations between the actions observed in hunting-gathering people and their material effects. Here one problem results from the flattening-out of the temporal dimension. The ethnographer does not have exportable

6 Following the semantic parallelism we could call it the 'Archaeology of the Counter-reformation'. For a wider criticism of post-modernism see e.g. Lull 1989.

7 Between the concept of culture of the Orthodox Archaeology and that of the culture as adaptation (system) there is another alternative, that established by Marx and Engels in 1846. We refer the interested reader to *Die deutsche Ideologie*.

8 (cf. Gándara 1982: 69) '3) The organized nature of the archaeological record and the *a priori* reject of limits, the role of analogy as source of hypothesis and 4) The need for controlling representatively, certitude and meanings of the observations done in the archaeological record.'

9 See e.g. Davidson 1981 for an insider's criticism.

10 We emphasize of *space* to distinguish our approach from the empiricist 'organization in space'.

explanations for the distribution processes he/she observes precisely because of their flat, ahistorical perspective. It is therefore expected that final conclusions achieved with Middle Range Theory, even if with higher certainty, will not surpass the descriptive level reached by the other palaeoethnographic approach.

One of the basic propositions of the New Archaeology is the non-random distribution of characters and position of archaeological items. This postulate demolishes certain statistical practices of the OAS, such as graphs for samples of *fossiles directeurs* from stratigraphic excavations, but has been, in our opinion, a source of some misunderstanding between the heirs of the New Archaeology.<sup>11</sup>

For example, the use of random test pits to obtain a representative sample often becomes an undesirable practice. When all that is proposed is no more than the mean testing of the basic theoretical postulate, this pithy digging destroys precisely the most important information: the global context of items.

This problem is linked with another idea: the distribution of objects is considered as a continuum in space<sup>12</sup> and not as a discrete phenomenon susceptible to hierarchization at different levels. The absence of hierarchization is also seen in the statistical treatments used. Therefore it is not unusual for results to be poor and not to achieve the level of what could be deduced subjectively. In consequence it is also not surprising to see some authors contemplating their interpretations of spatial distributions guided just by some uncertain logic or ethnographic influences (Legoupil 1989; Bosinski 1979; Hahn 1988).

#### Our point of view

First of all some assumptions. The whole archaeological record is, in fact, a sample, the representativeness of which must be assumed at least in principle if we think that archaeology is possible.<sup>13</sup> This is similar to other enabling scientific principles such as actualism and uniformitarianism.

The more complete the record, the more significant the sample and confidence in the use of statistical inferences. This also follows from a systemic contention. Each item acquires significance within its global system and those systems in the relationship with other item-complexes. However, we disagree with never-ending data collection. In practice, it is possible to work with samples because fortunately space distributions are discrete, as are some social categories. Moreover, there are some hierarchized levels in space organization, just as there are also some possible levels in human organization.<sup>14</sup>

The dialectical relation between social and economic organization can also be seen in the explanatory factors for settlement organization. For the first we can presume economic factors prevailing, for the second factors of social organization.

Social organization is a conscious phenomenon but it is not always evident (apparent-reflexive) to the people involved. The 'scientific' explanation of behaviour is not one that can give us someone of a 'non-scientific' thinking society.<sup>15</sup>

Therefore, it is not relevant to ask the people directly. For example the relationship between the organization of refuse deposition and social

11 Within the internal coherence of OAS the statistical problem does not exist: only one pyramid in each continent is enough to document thought transmission.

12 E.g. in Foley 1981 the archaeological record of mobile peoples 'should be viewed not as a system of structured sites, but as a pattern of continuous artifact distribution and density'. The final logical results of this contention are staggering. For example, if we take only the northern coast of the Beagle Channel up to 5 km inland, this means covering the landscape with approximately 9,000,000 1 sq. m pits randomly distributed to collect only a 1% representative sample. There follows an urgent need not to delay the beginning of this pharaonic task, in order not to be overtaken by the digging of the whole archaeological remains by the traditional positivist archaeology. But it leads in practice to the same goals as in cultural history: mapping items and correlating, this time, the patterns observed to ecological

features to accord with an adaptive definition of culture.

13 We believe (but this is not the right place to develop it) that there is no full proper philosophy of archaeological statistical theory. Most of the requirements are imported from other applications of statistics such as in psychology or geography. This is clear when we speak of 'representative sample size' or of 'threshold of significance'.

14 From another point of view it is also correct to think of discrete phenomena if we define 'archaeological site' *sensu lato* and we establish a hierarchization of those 'sites'. This hierarchization will come, partially, from the temporal dimension. In addition, the behaviour, even if continuous, will be fixed in a material record that is concrete, i.e. discrete and discontinuous.

15 We omit from this discussion the question of which way of thinking is more adequate for each society. For ours we assume the first.

organization is not always apparent to them, as the former is not an explanation for the latter.

The elements we think relevant for investigating social-economic organization are processes of production and distribution, both linked with social reproduction. The key here is to isolate the pertinent categories visible in the archaeological record. Of course, these are not easily apparent general categories such as 'faunal debris' or 'flakes' or 'retouched flakes', but elements with some kind of evaluated social weight, (e.g. 'lithic production refuse', 'high nutritive-grease containing pieces of meat', 'inedible pieces of animal' . . .).

At this point the usefulness can be appreciated of formulating questions from already-known answers. The old hunter-gatherer settlements (*Yamana* included) are therefore perfectly adequate as experimental places to elaborate the manner of articulating those types of question that can serve in Palaeolithic archaeology. These answers must be found in the archaeology itself.

One of the problems to be resolved is precisely the dialectic between the diachronic system and synchronic evidence, which can alter, as we have seen, the characterization of sites. This problem is also hard to solve in the Palaeolithic record.

For our purposes, archaeology in the Beagle Channel offers some advantages:

The *Yamana* were relatively well documented.

We know there can be no objective written description, but we have a variety of descriptions that can be contrasted and filtered, as well as a substantial amount of visual information such as films and photographs and, finally, a good sample of items in museums.

For the *Yamana* high mobility and a broad-spectrum diet together with the special features of the Channel resulted in behaviour that was not sharply oriented by season. The special social and technical adaptation restricted their movements to a relatively small area.

Anthropogenic factors, accumulation of large

amounts of shell and other refuse, created rapid sedimentation. This has been matched by specially developed excavation techniques that discriminate between fine deposition episodes. We can distinguish between items dropped over the occupied surface and conscious garbage deposit in shell-middens, in what constitutes a different category in time and energy expenditure.

Another consequence of the *conchero* site type is visibility, which constitutes a considerable advantage over, for example, the archaeology of the neighbouring *Selk'nam*s.

### Conclusion

The Argentinian-Spanish Project on the Northern Coast of Tierra del Fuego has the following aims: to compare the various ethnographic sources and establish some conclusions for the decline of the *Yamana*, as well as obtaining some instrumental concepts to be used in Palaeolithic archaeology. We are especially interested in extracting social explanation from spatial organization. We do not pretend to transport the *Yamana* to the European Palaeolithic nor to conclude our study with merely the description of activities and distribution of *Yamana* settlements, but to elaborate new forms of questioning, i.e., long-term research into theoretical-methodological issues.

Therefore the project in recent *Yamana* archaeology which began in 1988 has isolated a clearly identified hut-structure of about 3 m diameter centred in a 64-sq.-m excavated area in a well-defined small cove. The aim is to analyse first the internal and then the external distribution of significant categories, to compare them with other similar features in the same and some other *Yamana* settlements and, finally, to establish the complete integration of the different structures detected in the cove if they were once contemporarily occupied.

All that cannot be done at the same time, and we have just concluded the first step, but the results at the moment are very encouraging.

## References

- BARGATZKY, T. 1984. Culture, environment and the ills of Adaptationism, *Current Anthropology* 25(4): 399–416.
- BINFORD, L.R. 1977. *For theory building in archaeology*. New York (NY): Academic Press.
1978. *Nunamiut ethnoarchaeology*. New York (NY): Academic Press.
1980. Willow smoke and dogs' tails: hunter-gatherer settlement systems and archaeological site formation, *American Antiquity* 45: 4–20.
1983. *In pursuit of the past*. London: Thames & Hudson.
- BIRD, J.B. 1938. Antiquity and migrations of the early inhabitants of Patagonia, *Geographical Review* 28: 250–75.
- BIRDELL, J.R. 1968. Some predictions for the Pleistocene based on equilibrium systems among recent hunter-gatherers, in R.B. Lee & I. DeVore (ed.), *Man the hunter*: 229–40. Chicago (IL): Aldine.
- BOSINSKI, G. 1979. *Die Ausgrabungen in Gönnersdorf 1968–76 und die Siedlungsbefunde der Grabung 1968*. Vol 3. Wiesbaden: F. Steiner Verlag.
- BRIDGES, L. 1947. *Uttermost part of the earth*. London: Hodder & Stoughton.
- BRIDGES, T. 1892. Datos sobre Tierra del Fuego comunicados por el reverendo Thomas Bridges, *Revista del Museo de La Plata* 3: 313–20.
- BUCHANAN, W.F. 1988. *Shellfish in prehistoric diet (Elands Bay, S.W. Cape Coast, South Africa)*. Oxford: British Archaeological Reports. International series 455.
- CHAPMAN, A. 1982. *Drama and power in a hunting society: the Selk'nam of Tierra del Fuego*. Cambridge: Cambridge University Press.
1989. *El fin del mundo: los selk'nam de Tierra del Fuego*. Buenos Aires: Vazquez Mazzini Eds.
- DARWIN, C. 1839. *Journal and remarks (1832–1836), in Narrative of the surveying voyages of His Majesty's ships Adventure and Beagle between the years 1826 and 1836 . . . III*. London: Henry Colburn.
- DAVIDSON, I. 1981. Can we study prehistoric economy for fisher-gatherer-hunters?, in A. Sheridan & G.N. Bailey (ed.), *Economic archeology*: 17–33. Oxford: British Archaeological Reports. International series 96.
- EMPERAIRE, J. 1955. *Les nomades de la mer*. Paris: Ediciones de la Universidad de Chile.
- EMPERAIRE, J. & A. LAMING. 1961. *Les gisements des îles Englefield et Vivian dans la mer d'Otway (Patagonie australe)*, *Journal de la Société des Américanistes* 50: 7–77.
- ESTÉVEZ, J. et al. 1984. Arqueología como Arqueología Propuesta para una terminología operativa, *I Jornadas Metodología Investigación Prehistórica*: 21–8. Madrid: Ministerio de Cultura.
- FALKNER, T. 1774. *A description of Patagonia and the adjoining parts of South America: containing an account of . . . Hereford*.
- FITZROY, R. 1839. Proceedings of the second expedition (1831–1836) under the command of captain Robert Fitz-Roy (R.N.), in *Narrative of the surveying voyages of His Majesty's ships Adventure and Beagle between the years 1826 and 1836 . . . II*. London: Henry Colburn.
- FOLEY, R. 1981. Off-site archaeology: an alternative approach for the short-sited, in *Patterns of the past: studies in honour of D. Clarke*: 157–83. Cambridge: Cambridge University Press.
- FORSTER, G. 1777. *A voyage round the world, in His Britannic Majesty's sloop Resolution, commanded by Capt. James Cook, during the years 1772, 3, 4, and 5*. London: B. White, J. Robson, P. Elmsley & G. Robinson.
- FORSTER, J.R. 1778. *Observations made during a voyage towards the world, on physical geography, natural history and ethic philosophy . . .* London: G. Robinson.
- GAMBLE, C. 1986. *The palaeolithic settlement of Europe*. Cambridge: Cambridge University Press.
- GÁNDARA, M. 1982. La vieja 'nueva arqueología', in *Teorías, métodos y técnicas en arqueología*: 59–159. Méjico: Inst. Panamericano Geografía e Historia.
- GUSINDE, M. 1924. Cuarta expedición a la Tierra del Fuego (informe del Jefe de Sección), *Publicaciones del Museo de Etnología y Antropología de Chile IV*: 7–67.
1931. *Die Feuerland-Indianer Vol I: Die Selknam*. Modling: Verlag der Internationalen Zeitschrift Anthropos.
1937. *Die Feuerland-Indianer. Vol. II: Die Yamana*. Modling. Quotations from Spanish translation: Centro Argentino de Estudios Etnológicos. Buenos Aires, 1986, 3 vols.
- HAHN, J. 1988. *Die Geissenklösterle-Höhle im Achtal bei Blaubeuren I*. Stuttgart: K. Theiss Verlag.
- HARPENDING, H. & H. DAVIS. 1977. Some implications from hunter-gatherer ecology derived from the spatial structure of resources, *World Archaeology* 8 (3): 275–86.
- HARRIS, M. 1977. *Cannibals and kings: the origins of cultures*. London: Random House. Quoted from Spanish translation, *Canibales y reyes, los orígenes de las culturas*. Madrid: Alianza Ed.
- HEFFLEY, S. 1981. Relationship between northern Athapaskan settlement patterns on resource distribution: an application of Horn model, in B. Winterhalder and Eric Alden Smith (eds.), *Hunter-gatherer foraging strategies: ethnographic and archaeological analyses*: 126–47. Chicago: University of Chicago Press.
- HEUSSER, C. 1984. Late Quaternary climates of Chile, in J.C. Vogel (ed.), *Late Cainozoic Palaeoclimates*

- of the Southern Hemisphere: 59–83. Rotterdam: A.A. Balkema.
1989. Climate and chronology of Antarctica and adjacent South America over the past 30,000 yr, *Palaeogeography, Palaeoclimatology, Palaeoecology* 76: 31–7.
- HYADES, P.D. & J. DENIKER. 1891. Anthropologie et Ethnographie, in *Mission Scientifique du Cap Horn (1882–1882)* Vol. VII. Official ed. Paris.
- IMBELLONI, J. 1947. El poblamiento de América, *Revista de la Universidad de Buenos Aires*, fourth serie, I: 9–35.
- JULIEN, M., C. KARLIN & P. BODU. 1987. Pincevent: où en est modè le théorique aujourd'hui?, *Bull. Soc. Preh. Franç.* 84 (10–12): 335–42.
- KEELEY, L.H. 1988. Hunter-gatherer economic complexity and population pressure: a cross-cultural analysis, *Journal of Anthropological Archaeology* 7 (4): 373–411.
- KING, P. PARKER. 1839. Proceedings of the First Expedition (1826–1830) under the command of captain P. Parker King. R.N., F.R.S., in *Narrative of the surveying voyages of His Majesty's ships Adventure and Beagle between the years 1826 and 1836...* Vol. I. London: Henry Colburn.
- LEFEBVRE, H. *Logique formelle, logique dialectique*. Paris: Anthropos.
- LEGOUPIL, D. 1988. Últimas consideraciones sobre las dataciones del sitio de isla Englefield (seno de Otway), *Anales del Instituto de la Patagonia* 18: 95–9.
1989. Punta Baja. Editions Recherche sur les Civilisation, Memoire 84. Paris.
- LUBBOCK, J. 1865. *Prehistoric times as illustrated by ancient remains and the manners and customs of modern savages*. London. Quoted from 4th edition, London, 1900.
- LULL, V. 1989. Recensión de 'En Busca del Pasado. Interpretación en Prehistoria', *Archivo Español de Arqueología* 62: 325–6.
- LYMAN, R. LEE. 1989. Seal and sea lion hunting: a zooarchaeological study from the southern coast of North America, *Journal of Anthropological Archaeology* 8: 68–99.
- MARTIAL, L.F. 1888. Histoire du voyage, in *Mission Scientifique du Cap Horn (1882–1883)*, Vol. 1: 184–215. Official ed. Paris.
- MARTINIC BEROS, M. 1973. Panorama de la colonización en Tierra del Fuego entre 1881 y 1900, *Anales del Instituto de la Patagonia* IV (1–3): 5–69. Punta Arenas.
1989. Los Canoeros de la Patagonia Meridional. Población histórica y distribución geográfica (siglos IXI yXX). El fin de una etnia, *Journal de la Societé des Americanistes* LXXV: 35–61.
- MARX, K. & F. ENGELS. 1974. *Concepción materialista y concepción idealista*. Méjico: Ediciones Roca.
- MENGHIN, O.F.A. 1960. *Urgeschichte der Kanuindianer des sudlichsten Amerika*, in, *Steinzeitfragen der Alten und Neuen Welt*: 343–75. Bonn.
- MUSTERS, G.C. 1871. *At home with the Patagonians (a year's wanderings over untrodden ground from the Straits of Magellan to the rio Negro)*. London: John Murray.
- ORQUERA, L.A. & E.L. PIANA. 1988a. Human littoral adaptation in the Beagle Channel region: the maximum possible age, *Quaternary of South America and Antarctic Peninsula* 5 (1987): 133–65. Rotterdam: Balkema.
- 1988b. Composición tipológica y datos tecnomorfológicos y tecnofuncionales de los distintos conjuntos arqueológicos del sitio Túnel I (Tierra del Fuego), *Relaciones de la Sociedad Argentina de Antropología* 17(1) (1986–1987): 201–39.
- In press. Littoral adaptation in the Beagle Channel region and surroundings, in D. Stuart & L. Borrero (ed.), *Tierra del Fuego: settlement and subsistence on Mankind's southern frontier*. Oxford: British Archaeological Reports.
- ORQUERA, L.A., E.L. PIANA & A.H. TAPIA. 1984. Evolución adaptativa humana en la región del canal Beagle. Paper read at Primeras Jornadas de Arqueología de Patagonia (Trelew, Chubut).
- ORQUERA, L.A., A.E. SALA, E.L. PIANA & A.H. TAPIA. *Lancha Packewaia: arqueología de los canales fueguinos*. Buenos Aires: Huemul.
- ORTIZ TRONCOSO, O.R. 1975. Los yacimientos de Punta Santa Ana y Bahía Buena (Patagonia austral): excavaciones y fechados radiocarbónicos, *Anales del Instituto de la Patagonia* VI: 93–122.
1980. Punta Santa et Bahia Buena: deux gisements sur une anciennes ligne de rivage dans le détroit de Magellan, *Journal de la Societé des Américanistes* 66: 133–204.
- OSBORN, A.J. 1977. Strandloopers, mermaids and other fairy tales: ecological determinanta of marine resource utilization – the Peruvian cas, in L. Binford (ed.), *For theory building in archaeology*: 157–205. New York (NY): Academic Press.
- PERLMAN, S.M. 1980. An optimum diet model, coastal variability and hunter-gatherer behaviour, in Michael B. Schiffer (ed.), *Advances in archaeological method and theory* Vol. 3: 257–310. London: Academic Press.
- PIANA, E.L. 1984. Arrinconamiento o adaptación en Tierra del Fuego, in, *Antropología argentina* 1984: 7–110. Buenos Aires: Editorial de Belgrano.
- RIBEIRO, D. 1971. *Fronteras indígenas de la civilización*. México: Siglo XXI.
- SAXON, E.C. 1979. Natural prehistory: the archaeology of Fuego-Patagonian ecology, *Quaternaria* XXI: 329–56.
- SCHIAVINI, A.M. MS. Estudio de la relación entre el hombre y los pinnipedos en el proceso adaptativo humano al Canal Beagle, Tierra del Fuego,

- Argentina. Unpublished Ph.D. dissertation. Universidad de Buenos Aires.
- SCHMID, T. 1865. Letters published as 'Misionando por Patagonia Austral (1858–1865): usos y costumbres de los indios patagones', *Academia Nacional de la Historia, Biblioteca de cronistas y viajeros del Rio de la Plata*, Vol. I. Buenos Aires.
- STAMBUK, P. 1986. Rosa Yagán. El ultimo eslabón. Santiago de Chile.
- STOCZKOWSKI, W. 1990. Homme préhistorique et imagination conditionnée, in *Peintures d'un monde disparu*: 61–9. Solutré: Musée Départemental de Préhistoire.
- SUTTON, D.G. 1982. Towards the recognition of convergent cultural adaptation in the Subantarctic Zone, *Current Anthropology* 23 (1): 77–97.
- TOULMIN, S. & J. GOODFIELD. 1968. *The discovery of time*. London: Hutchinson.
- TRIGGER, B.G. 1984. Alternative archaeologies: nationalist, colonialist, imperialist, *Man* 19 (3): 355–70.
- WATSON, P.J., S. LEBLANC & CH.L REDMAN. 1971. *Explanation in archaeology: an explicitly scientific approach*. New York (NY): Columbia University Press
- WILMSEN, E.N. 1973. Interaction, spacing, behaviour and the organization of hunting bands, *Journal of Anthropological Research* 29: 1–31.
- WINTERHALDER, B. 1981. Optimal foraging strategies and hunter-gatherer research in anthropology: theory and models, in B. Winterhalder & Eric Alden Smith (eds.), *Hunter-gatherer foraging strategies: ethnographic and archaeological analysis*: 13–35. Chicago: University of Chicago Press.
- YESNER, D.R. 1980. Maritime hunter-gatherers: ecology and prehistory, *Current Anthropology* 21 (6): 727–50.
1983. Live in the garden of Eden: constraints of marine diets for human society, Paper read at the Wenner Gren. Foundation for Anthropological Research International Symposium (Cedar Cove, Florida). Symposium 94 ('Food preferences and aversions').
- ZELENY, J. 1969. Zum Wissenschaftsbegriff des dialektischen Materialismus, in A. Schmidt (ed.). *Beiträge zur marxistischen Erkenntnistheorie*: 73–86. Frankfurt: Suhrkamp Verlag.