

CAUSALITY AND INTERNAL DYNAMICS IN THE CONSTITUTION OF ARCHAEOLOGICAL SETTLEMENT PATTERNS¹

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I

Keywords: settlement patterns, archaeology, causality, causal factors, social dynamics, social space, archaeological record.

Abstract: This article deals with one of the most important issues in modern archaeology: settlement patterns, the manner in which human settlements (and their remnant correspondent as archaeological sites) situate themselves on the landscape, the way they constitute their internal shape, the arrangement of their dwellings, public spaces, transit areas, functional areas, the way people organize the space within the place they live in. Since the late 50's the American archaeology, feeling the influence of the New Archaeology and the imprint of the European Spatial Archaeology, developed a strong interest on the theoretical and methodological problems related to settlements. Nevertheless, there are not so many approaches trying to solve perhaps the most stringent aspect of this issue: the causality of the phenomena, what causes the specific characteristics of the settlements, what determines their general and particular features. This is a fundamental ontological and epistemological theme.

Along this paper, I explore some of the most relevant bibliographical contributions to the issue, analyze them and extract from them the relevant aspects for our discussion. Then I propose a preliminary alternative model, not radically distinct from the rest of the existing models, but slightly different with emphasis on certain causal factors that I consider of ontological priority in the constitution of the formal and structural aspects of human settlements. The core concept of my posture is the social space. This is the space seen through its social manifestation. Space is everything that surrounds us; social space is the spatial dimension of human existence. The social space is not just a mirror where human society reflects; this is the stage holding the entire dynamics of our lives. Social space has two dimensions: the physical and the social one. The first dimension also is made of two levels: the physical-natural dimension (the natural environment and all its component elements) and the physical-produced or anthropic dimension (the nature modified by man and all the human products, as buildings, artifacts, cities, etc.).

These concepts form the basic frame for our discussion. In addition, we will discuss about the compatibility of analytical levels that divide internally the social structure and space structure in parallel. Human society is a continuously changing universe composed by the articulation of social groups defined by a diversity of criteria. For us, the most important are the productive social groups, which are socially significant groups involved in productive, active relationships that provide the "fuel" for the functioning mechanisms of the society. There are several concentric, hierarchical analytical levels inside every such group, and they concern the degrees of social-productive integration of the integrants. The levels are: the individual, the producer, the productive agent, the group itself. These levels correspond to symmetrical analytical space levels, because the social levels require space in order to

¹ As well as my previous article on proxemics published in *Dacia* LII (2008), this is an extended work on topics initially treated in the Master degree thesis "Ser social y espacio social en arqueología" (*Social entity and social space in archaeology*), presented by the author in the National School of Anthropology and History (ENAH), Mexico City, 2001. An earlier version of this paper was published in Mexico in *Boletín de Antropología Americana* 40, 2004.

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achieve their goals and accomplish their socially significant activities. The corresponding space levels are: personal space, particular space, inscribed space, adscribed space, concepts that I almost do not discuss in this article because they would require many pages, but they were treated in other publication (Ardelean 2003). Therefore, in order to comprehend the functioning of the settlements as particular manifestations of the social space, we must manage such theoretical schemes.

In archaeological theory, the most commonly discussed causal factors for the constitution of settlement patterns were the natural environment, the technology (as a component of culture), and ideological or mental aspects (religion, spirituality, cosmologies). I try to explain, as clear as possible, the good and bad of every main factor and explore their real potential for the adequate explanation of the phenomena. I finally pronounce for a series of aspects that I consider the real causal factors for the human settlements. I intent to reduce the exaggerated importance previously given to the natural environment and prove there are more powerful factors that are able to limit the impact of nature and impose over the environmental conditions. I especially emphasize proxemics, culture, property relationships and superstructure.

Proxemics is a fascinating issue I have already treated in three previous works, inclusively in this prestigious review (Ardelean 2008). This concept refers to the relationship between man and space, the way people perceive the space and the way they behave in the spatial frame, they relation to spatial elements and to other people. Together with the property relationships and the cultural traits of every specific community, I consider it as one of the most important factors for the constitution and shape of human settlement. Above this factors and finally mixing with them, superstructure (the whole of mentalities, beliefs, elite ideology, dogmas) gives the final touch to the shape and composition of human cities, towns, and villages.

Cuvinte cheie: modele de aşezare, arheologie, cauzalitate, factori cauzali, dinamici sociale, spațiul social, registru arheologic.

Rezumat: Acest articol se ocupă de unul din cele mai interesante subiecte ale arheologiei moderne: modelele de aşezare (*settlement patterns*), modul în care aşezările umane (şi corespondentul lor “residual” ca situri arheologice) se situează în mediul înconjurător, felul în care se constituie forma lor internă, aranjarea clădirilor, a spațiilor publice, a zonelor de tranzit, a ariilor funcționale, maniera în care oamenii își organizează spațiul în locul în care traiesc. Din anii '50 înapoi, arheologia americană, mai ales sub influența Noii Arheologii (sau a Arheologiei Procesuale, cum se mai numește, curent de mare vigoare teoretică și metodologică lansat de Lewis Binford) și a Arheologiei Spațiale europene (promovată de către Clarke), dezvoltă un puternic interes în problematicile teoretice și metodologice legate de aşezarea umană. Totuși, nu sunt prea multe abordările care încearcă să rezolve ceea ce pare a fi aspectul cel mai serios al acestei teme: cauzalitatea acestui fenomen, cauzele care generează caracteristicile speciale ale aşezărilor, ce determină trăsăturile lor generale și particulare. Este o temă ontologică și epistemologică fundamentală.

Articol de față își propune investigarea unora dintre cele mai importante contribuții bibliografice asupra acestei chestiuni, încercând totodată propună un model alternativ preliminar, nu absolut diferit de cele deja existente, însă ușor văzut din alta perspectivă cu accent pe factorii cauzali pe care eu îi consider ca având prioritate ontologică în constituirea trăsăturilor formale și structurale ale aşezărilor umane. Conceptul central al analizei de față este spațiul social. Acesta poate fi înțeles ca spațiu văzut prin prisma manifestării proceselor sociale. Spațiul este tot ceea ce ne înconjoară; însă spațiul social este dimensiunea spațială a existenței umane. Spațiul social nu este doar un fel de oglindă în care s-ar reflecta societatea umană, el este scenariul pe care se desfășoară întreaga dinamică a vieții umane cu complexitatea proceselor care o compun. Spațiul social are două dimensiuni: cea fizică și cea socială. Prima dimensiune la rândul ei se compune de două nivele: dimensiunea fizico-naturală (mediul înconjurător natural cu tot ceea ce-l integrează) și dimensiunea fizico-produsă sau antropică (natura modificată de către om împreună cu toate produsele umane, clădirile, artefactele, orașele și satele etc.).

Aceste concepte alcătuiesc cadrul bazic al discuției noastre. În plus, vom vorbi despre compatibilitatea între nivele analitice care divid pe dinăuntru atât structura socială precum și structura spațială, în paralel. Societatea umană se înscrie într-un univers aflat într-o continuă transformare, alcătuit prin articularea unor grupuri sociale definite în baza unei mari diversități de criterii. Pentru noi, cele mai importante sunt grupurile sociale productive, grupuri semnificative din punct de vedere social, implicate în relații active, productive care oferă forța necesară pentru funcționarea întregii societăți. Există câteva nivele analitice, concentrice și ierarhice în cadrul fiecăruia dintre aceste grupuri care se referă la gradul de integrare socio-productivă a membrilor. Nivelele sunt: individul, producătorul, agentul productiv, grupul însuși. Aceste nivele corespund cu nivele analitice spațiale simetrice lor, dispuse în aceeași formă în cadrul spațiului social, deoarece nivelele sociale au nevoie de dimensiunea spațială pentru a-și duce la bun sfârșit activitățile și a-și atinge obiectivele. Nivele spațiale corespunzătoare sunt: spațiul personal, spațiul particular, spațiul înscris și spațiul adscris. Aceste concepte sunt discutate tangențial în articolul de față dat fiind că au fost deja abordate în detaliu într-o publicație anterioară (Ardelean 2003). Prin urmare, pentru a înțelege funcționarea aşezărilor ca manifestări particulare ale spațiului social, trebuie să folosim astfel de scheme teoretice.

În teoria arheologică, factorii cauzali cei mai vehiculați în legătură cu formarea așezărilor umane sunt mediul înconjurător natural, tehnologia (ca o componentă a culturii) precum și aspectele mentale sau ideologice (religie, spiritualitate, cosmologie). Articol de față își propune să explice, cât mai clar posibil, părțile bune și rele ale fiecărui factor în parte și să exploreze adevărul lor potențial pentru o explicație multumitoare a fenomenului în discuție. În fine, autorul se pronunță în favoarea unor aspecte pe care le consideră drept adevărații factori cauzanți ai așezărilor umane, încercând să reducă din exagerata importanță acordată de obicei mediului înconjurător. Autorul consideră că există factori cu mult mai pregnanți, capabili să limiteze influența mediului asupra formării așezărilor și inclusiv să se impună asupra condițiilor ambientale. În mod special, autorul pune accent pe conceptele de proxemică, cultură, relații de proprietate și superstructură.

Proxemică este o temă fascinantă pe care deja am tratat-o în alte lucrări, inclusiv în paginile acestei prestigioase reviste (Ardelean 2008). Acest concept se referă la relația dintre om și spațiu, la felul în care oamenii percep spațiul care-i înconjoară, modul în care se comportă în cadrul spațial, relația lor cu elementele spațiale și cu alți oameni. Alături de relațiile sociale de proprietate și de trasăturile culturale specifice fiecărei comunități, consider proxemică drept unul din cei mai importanți factori cauzali pentru constituirea și definirea așezărilor umane, preistorice sau moderne. Peste acești factori se suprapune și interferează cu ei, suprastructura (întregul conglomerat de mentalități, norme, credințe, ideologii oficiale sau de grup, dogme), care ajunge să dea nuanța finală formei și compoziției așezărilor umane, fie că e vorba de un oraș, un centru minor sau un sat.

This article tries to develop a new discussion about the relevant factors that significantly interact as causes of the formal manifestations of social space. Settlement pattern represents the formal macrosynthesis of the dialectic interaction of the various social space levels. This text involves again a series of theoretical and conceptual developments that I suggested earlier in several works about the structure and internal analyses of social space. I touch it here in order to evaluate aspects of profound importance for the study, interpretation and conceptualization of that particular manifestation of archaeological record that we use to know as settlement pattern (see Ardelean 2001, 2000-2001, 2003, 2004, 2008).

The aware reader will easily suspect, from the very title of this paper, that there is an explicit allusion to a famous article, Bruce Trigger's from 1968 *The Determinants of Settlement Patterns*, which is the widely known version of an even earlier work (1967) of the Canadian author. I commence this discussion precisely taking into account Trigger's assumptions, because the main mobile for my article is to face again the old polemics about the causal mechanisms that lay below the concrete conformation of the settlement patterns seen from a generalizing point of view as cultural manifestation proper to any human society on Earth (that means I will not limit my model to sedentary ones), together with defending the post-processual idea of pluricausality and equifinality as indispensable posture focused on achieving objectively valid explanations. If I mention "causality" and "internal dynamics" from the beginning of this text is because I want to emphasize a major difference between me and Trigger's work published four decades ago. We will not talk about "determinants", but about *causal factors*, because concepts as "determinant", "determination" inevitably involve a limited epistemological and ontological approach assuming a rigid and unidirectional relationship between one cause and one effect. Such a position would probably be defendable from the side of the New Archaeology (now an *old* theoretical position...), and less sustainable in the more skeptic and cautious field of the so-called post-processualism. This hard-to-define profile of nowadays archaeology promotes – in some of its branches – a sort of skepticism and theory of doubt that are clearly justified and welcomed inside the chaotic archaeological theory (although less visible on its practical manifestations) and useful in the necessary struggle against the "fossilized" postures of modern archaeology and the remnant scientism typical for the exaggerated self-confidence manifested after the climax of the New Archaeology in the last three decades of the 20th century. We live today in an era of potentially aggressive changes in the theoretical and methodological fields of our science and many of the postulates and old-fashioned assumptions about the way we make archaeology must be rethought.

Gordon R. Willey officially founded and baptized the settlement pattern archaeology in the 50's through his monumental work about the archaeology of Virú Valley in Peru. From that publication in 1953 onward, the next decade saw a huge effort for defining and strengthening the study of ancient settlement and houses. Trigger's contribution fit perfectly in that milieu and was one of the most well

known and used analytical schemes: short and simple. He said that the settlement pattern studies should follow three analytical levels. The first is the level of the household, the level of architectural unit, the least one. The second is the level of the settlement itself, the level of the interaction between constructions and spaces. The third one is the inter-site level, the regional level, that of the geographic interaction between various settlements.

My interest in this occasion is with the second level, the site level and the archaeological structures that form it. But that does not mean I wouldn't touch the first or third levels. It would be useful to stress that I do not intend to deal with the urban genesis, nor with the urban-related theories, nor will I analyze the historical evolution of settlements. My interest remains focused on the articulation of spaces inside a pattern, the concrete structure that constitutes the anatomy of settlements, on a level of theoretical generality.

II

There is an obvious and logical causal relationship between the archaeological record and the society that produced it. The settlement pattern, as a fundamental analytical aspect of archaeological record, is the effect of spatial "imprint" of social dynamics and complexities. This is not a direct, simple, isomorphic reflect. I use the word complexity not to talk about a form of internal division of societies, but to express a fundamental feature of human society; it is a term that relates closely and semantically to society's inherent dynamics, to the articulation of actions, practices and social processes. In majority of cases through the development of settlement pattern archaeology, the explicative models deal with the superior, macro-levels (regional levels) focusing on the geographic setting of sites and their interaction with the environment and cultural surroundings and less on the internal structure of the settlement and the causal chain that generates it.

In order to ease the task, I will first review the opinions of some authors about the causal factors of spatial phenomena, although it would not be possible to accomplish an exhaustive analysis nor will I follow an explicit critical approach. I will rather intend to offer a general vision over the variety of proposals flowing from the different theoretical positions. Afterwards, I will try to elaborate a synthesis integrated in an incipient model in which I will emphasize the importance of some factors. Up to the end, I am going to conclude with some considerations about the concept and implications of territory in connection with the socio-spatial scheme I manage. I will always sustain multifactorial causality beneath the settlement pattern, approaching the distinct factors in a complex reciprocal interaction. As a reference point of my discussion, I consider very appropriate to center on the theoretical statements of two crucial authors – Bruce Trigger and Jürgen Brüggemann – attaching myself to the central idea resumed in this quote:

La capacidad de imaginación combinada con la capacidad de comprensión, da una visión mucho más verídica de una realidad social y cultural específica. Protege e inmuniza al investigador científico contra interpretaciones simplistas que buscan la explicación de algo complejo, como es la realidad social de un grupo humano a través de la relación de causa y efecto de un solo factor (Brüggemann 1991a: 85).³

Gordon R. Willey (1953), widely known as the founder of settlement pattern archaeology, does not expressly discuss on a systematic base the causal factors of this spatial manifestation of the social dimension, but among the pages he wrote we can find assumptions about a variety of that factors. He clearly suggests the relationship between society and the settlement pattern and defines this last one as "static mold that only bears the imprint of life", the best milieu for the understanding of structure and function of ancient societies. As a brief parenthesis, now we know that the archaeological record by no mean can be defined as "static", not even the way Lewis Binford (the founder of the New Archaeology or "Processual" Archaeology) meant it in late sixties. Willey refers to aspects which can be inferred from the

³ "The capacity of imagination combined with the capacity of comprehension both give a much more real vision about a specific social and cultural reality. It protects and immunizes the scientist against simplistic interpretations that look for the explanation of something complex, as the social reality of a human group, through the cause-effect relationship based on a single factor" (translation is mine).

data inside the settlement pattern. He identifies at least five main causal factors: the natural environment, the level of technology, the politics manifested through institutions, the social processes and, finally, culture. Anyway, Willey's definition of settlement pattern, the first definition of this specific manner to make archaeology, and probably the best or at least the sharpest ever, is worth considering:

The term "settlement pattern" is defined here as the way in which man disposed himself over the landscape on which he lived. It refers to dwellings, to their arrangement, and to the nature and disposition of other buildings pertaining to community life. These settlements reflect the natural environment, the level of technology on which the builders operated, and various institutions of social interaction and control which the culture maintained. Because settlement patterns are, to a large extent, directly shaped by widely held cultural needs, they offer a strategic starting point for the functional interpretation of archaeological cultures (Willey op. cit.: 1).

Irving Rouse (1972), during his conceptual development centered on analytical units such as *activity locus*, *activity assemblage* and *remnant settlement pattern*, elaborates a typology of patterns based on nucleation degree. The factors that make the difference between dispersed and compact patterns are, in his opinion, the resources available in the area, the subsistence modes and the concrete way society employs resources.

In Clarke (1979), we find four paradigms that lead approaches inside spatial archaeology: morphological, anthropological, ecological and geographic. Especially starting from the last three of them, reader can guess some causal factors of settlement patterns. The anthropological paradigm approaches the study of human settlements from the perspective of its organic relationship to the social processes and as a result of those; the ecological paradigm emphasizes the sites as integral part of ecological and environmental systems; the geographic paradigm refers to the setting of a system of sites in a landscape according to geographic factors. One can notice that Clarke deals especially with the regional level and the causes of the emplacement of a settlement in a given place. He prefers ecological factors and referential factors, that is, built upon exterior references, for example the situation of other sites.

In a position close to Clarke's we have Hodder and Orton (1976), also interested in the study of settlements on a large, macrospatial scale. The main factors that guide the situation of settlements in the "landscape" are the distance to water sources, the soil type, vegetation type, the presence/absence of other settlements nearby, the defense (a factor finely emphasized by Michael Rowlands, also), the distance to mineral and construction materials deposits, the vicinity of markets or trade routes. The different particular cultural reactions to this kind of stimuli determine the type of settlement pattern.

Flannery (1976: 195) sustains that spatiality between sites is given by socio-political factors. Once spatiality is established, environmental factors act over the setting of the settlement inside its *catchment area*.⁴ For Earle (1976: 197), the foundation and spatiality of villages and towns follows a series of laws, while the distance and spatial relationship between bigger settlements are ruled by different principles. This principles and laws do not depend solely on environment, but rather they depend on the competition for resources in a certain *hinterland*; such a factor, in my own opinion, is closely related to social group proxemics and stands as antecedent of defense processes (cf. Ardelean 2000-2001, 2008).

Brian W. Blouet (1972) emphasizes economic factors or, specifically, the causal relationship between economic transformations and the structural alterations inside the settlement patterns. There is a very strong relationship, author says, between site patterns and economic activity. Blouet connects these factors not precisely to the internal conformation of formal space, but instead he treats them as factors causally involved into the qualitative evolution of settlements: villages, towns, manufacturing centers, urban congregations.

Allan's (1972) approach is strongly tied to ecology. He emphasizes two kinds of causal factors: environmental and technological ones. Among the first ones, type of soil, climate, water availability, vegetation and comestible plants stand as most important. The technological category sums factors that relate mainly to the components of the production forces that act upon the environment accordingly to their own level of development. This author does not approach settlement pattern from the point of view of structural composition, but rather as a frame for population density. In certain way, settlement pattern

⁴ To see a wider and complete discussion about such a concept, better see Vita-Finzi and Higgs (1970) and some contributions in Clarke (1977).

becomes demographic pattern. This particular aspect of social space is assumed to be determined by the potential of sustainability of the environment, a widely spread idea among archaeologists, an idea closely connected with the concept of *carrying capacity*. In my opinion, it is a wrong and old-fashioned idea, resulted from the postulates of ecological determinism; the level of complexity of the culture marks the difference between people able to go on in spite of scarce resources. Finally, Allan considers that, beside those two kinds of causal factors, a certain paper belongs to cultural factors, as preferences, traditions and human needs.

Lynda Robinson (1979), who talks about the case of the Achaemenid settlement patterns in Persia, identifies a series of social and economic interrelated factors generated by the specific contexts of politics: immigration and reoccupation, fluctuations in the prices of land, changes in the distribution of the land, administrative changes in satrapies (provinces), and war. It is worth stressing the author's emphasis on property relationships and other socio-economical aspects related to the complex issue of land tenancy. The superstructural dimension of society (beliefs, customs, ideology, religion, rules, etc.) can also be important, author says; the political phenomena (and war as manifestation of that) use to affect the physical-natural and physical-produced dimension of space.⁵

Duncan, quoted in Castells (1980: 146), believes that the structure of a human settlement (an urban one) could be the result of the interaction of four fundamental elements: demography, physical environment, technology, and social organization as cluster of social institutions and practices.

R. E. W. Adams (1980) stresses the importance of the environment for the geographical emplacement of settlements and the internal conformation of their patterns, concretely using factors as the presence of swamps, channels, wetlands; an important factor is state's centralized control.

Sanders (1981: 361-362) deals with the ancient Mayan settlement patterns usually characterized by elite's residential cores surrounded by disperse but dense occupation spots. As major determinants are considered agricultural techniques, natural environment, and socio-political organization. According to this author, the presence of agricultural infields close to households, fertilized with domestic waste, human and animal manure, would cause the typical Mayan disperse pattern. I consider it as an insufficient explanation because the author does not explain the actual presence of cropping fields inside the settlement area. In Sanders's opinion, the variability of settlement patterns depends on the soil fertility and the comestible and cultivable plants available in the close environment. As another personal commentary, models that are more complex now surpass the old "center-and-periphery" vision about the Mayan settlement pattern.

Sanders and Price (1968) consider that a major centralizing political power determines a higher nucleation of the settlement pattern, while a lower nucleation is a clue on a simpler low-control form of government. This assessment is part of the tendency to explain the various types of settlement patterns through differences in the state of development and evolutionary levels of socio-political organizations.

Freidel (1981) defends an interesting opinion: if the spatial nucleation in a complex, "civilized" society is understood as a "social invention" distinct from the supposedly "natural" nucleation of the precedent simple communities, then we should conceive the residential dispersion in complex societies as a social invention based on the natural patterns of the antecedent disperse communities. Pointing concretely to the Maya Lowlands, Freidel emphasizes that, in spite of certain use of hydraulic systems, Mayans never achieved nucleation. In his opinion, the residential dispersion comes from social and cultural institutions that rest on a previous natural disperse pattern. He also finds a causal connection between social relationships of production and the compact or disperse settlement pattern.

Leventhal (1981: 206-207) relates the causality of settlement patterns to the property relationships. He tries to compare Mayan and Middle Age European societies. Then the disperse pattern could be explained by the form of property and land tenancy of the elite and of the people employed as work force.

We cannot leave aside Clark (1977) who, close to Trigger's model of 1968, establishes causal factors for each one of the resolution levels he proposes. The micro level rests upon individual and

⁵ "Physical-natural" and "physical-produced" dimensions of social space are concepts that I developed in previous works (cf. Ardelean 2001; 2003). In few words, they refer to the natural and anthropic components of the environment, but assumed from a social point of view.

cultural factors that surpass the economic ones.⁶ On the semi-micro level, the social and cultural factors impose over the economics, while this last causal aspect gains importance on the superior, regional level. Nevertheless, the author does not detail the discussion about the causality of the internal conformation of the space in an archaeological settlement and he does not explain which exactly the mentioned individual, social and cultural factors are.

Tringham (1972: xxii) sustains a holistic vision of determinants or causal factors:

However, to separate the study of the ecological-economic from sociological determinants of settlement would seem to be inviting a more unrealistic picture not only of each settlement situation, but also of broader macro-settlement patterns and the nature of the cultural development in general. The set of ecological factors cannot be studied in isolation from the products of human activities (the tangible remains of the community – the archaeological settlement); and the social factors cannot be isolated from the landscape of which the society was a part. The factors – ecological, economic, technological, socio-cultural – which cause variation in settlements and settlement patterns are to a great extent interdependent and interrelated.

The settlement pattern is the image of a community, its tangible manifestation, and the causal factors that underlie the spatial structure are as much natural as anthropic, articulating in necessary way.

Michael J. Rowlands (1972) conceives the causal bases of the settlement patterns as a response to stress stimuli as war, climate, diseases or wild animals. The defense determines not only the internal structure of the settlement as a whole, but also its regional levels. The defense, defined by the author as resistance against attacks, does not need to manifest through fortifications in the settlements; meanwhile, the presence of defense systems does not necessarily imply warfare. Defense proceeds based on a series of justifications according to which aspects of the social and community life are supposed to be defended. The defensive goals are of economic, territorial, political or ritual kind. The defense in its concrete forms depends on a series of environmental, technological, socio-political, tactical-strategic and cultural (traditional) factors. On one side, these factors frame and regularize the shape defense adopts in space; on other side, they influence the conformation of the physical-produced dimension of social space. The conclusion would be that there is a mutual influence between the defensive spatial forms and the spatial forms manifested in a settlement pattern. According to the same author, warfare can determine the concentration of individuals in a given area or their clustering in larger settlements of higher defensive and organizational potential. In some cases, the conflictive situations could obstruct the fission of settlements when they achieve critical sizes and cannot hold anymore the equilibrium with the available resources. The conformation of defense systems determine the positioning of a settlement in a certain area according to strategic criteria and it also affects the internal spatial pattern of settlements, their density of architectural units, as well as the concrete articulation of functional areas. Warfare affects socio-political stability of a society causing its internal spatial fragmentation or the establishment of new settlements, the evacuation or modifications due to invasions and immigrations. Conflicts can impose limitations to social activities, which can reflect in the very structure of the settlement. Finally, as a sort of conclusion:

The erection of fortifications is, in fact, the antithesis of communication and tends to impose limitations on social activities and alter the arrangement of dwellings that might be found in undefended settlements. (...) Warfare also disrupts socio-economic activities such as trade; in case where people import material, general insecurity may require the adoption of new materials and technical skills for the erection of habitations and other structures (idem: 459-460).

Rowlands mentions the case of walls in many archaeological sites around the world that do not reflect warfare but rather symbolic meanings.

The symbolic determinant of the settlement patterns is one of the most important ones emphasized by several scholars as Paul Wheatley (1971) or Mircea Eliade (1994). The main argument spins around an almost automatic relationship between cosmology and the “horizontal” form of the settlement. For Eliade,

⁶ In my own model, a basic individual-cultural factor is proxemics, the way people perceive and behave in space. Previous papers deal closely with this issue (Ardelean 2001, 2000-2001, 2008). I will mention this aspect further in this paper.

the layout of the ancient settlements (especially urban centers) manifests the materialization of a tendency of giving sacred attributes to profane space. But I consider that this factor cannot be considered primordial for the constitution of the spatial patterns (cf. Wiesheu 2002; Ardelean 2004).

Nevertheless, there are relevant cases in world archaeology. For example, the Roman urban centers whose core was designed upon the intersection of the two main axis, *cardo maximo* y *decumano maximo*, telluric projections of the skeleton of the heavens. According to Etruscan beliefs, these two celestial lines divided the sky into four sectors; meanwhile, the city area, delimited by the holy furrow, was declared as *templum*, that is sacred space. In this case, although the religious factor was not probably at the base of the generation of all Roman settlements, the cosmology has a powerful causal position. We cannot deny the symbolic implications of the settlement patterns in ancient cities in pre-hispanic times, in Mesoamerica⁷, as well as in South America. In the Roman case, such as in American and Chinese examples, the cosmological plans of settlements closely relate to concrete political contexts and to the ideological management of developed states. In Mayan archaeology, we could suspect an undoubtful involvement of religious motivations in the internal constitution and concrete manifestation of urban spaces, but the particular dynamics of the Mayan cities hide any obvious example of cosmological integration of areas, sectors and dwellings. Like the Romans, it is clear that Mayans used to define sacred areas (like *templum*) for their permanent monumental buildings of religious, administrative, elite residences or mixed functions. What we see today through the green walls of Mayan jungles are ruins dating especially from the last part of Mayan splendid Classic history, whose collapse made room for the Postclassic period (the transition occurred around centuries 10-11 A.D.). Every dynasty, every king, every ruling party had to erect their own temples, platforms, plazas, houses and palaces. The pyramids had their own life, had names like living beings, so they grew up, got old and died. Most of the structures from the initial times of this civilization are buried inside the bodies of newer pyramids dating from posterior times. I am sure that, at the beginnings of urban life in Mayan world, there was a vast use of religion reasons for the planning of the settlements; many archaeological discoveries repeatedly confirm it. But it would be almost impossible for us to actually understand the initial religious plans beneath the puzzle of structures from the last phases of occupation. Because, as well as in other cases in the world, religion played a crucial role in the causality of settlement patterns, but it did not do it all the time.

Returning to Wheatley (1971), he used to emphasize more the generating force of the religious factor at the beginning of urban centers; he was less concerned with the causal relevance of religion for the concrete disposition and articulation of the elements inscribed into the spatial heterogeneity of human settlements, urban or not. In his opinion, the first cities were ceremonial centers with religious functions carried by priestly elites.

The religious factor holds an obviously important position in the constitution of social space, in the concrete manifestation of physical-produced dimension of space. Nevertheless, until now we lack solid analytical models to clarify its true paper (on the level of objective reality) in the internal articulation of archaeological space as particular manifestation of social space.

The “sacred geography” can explain the presence of religious and symbolic spatial elements associated to the representation of the cosmos and that form the stage of human life. As a manifestation of the ideologies of power in societies that are in process of crystallization of their internal complexity, religion transforms settlements into spaces of mythical creation, in reflections of cosmos, in stages for the “eternal return”. But that does not explain and does not determine the concrete disposition and articulation of the constructive elements of the space; it does not solve the particular equations of the archaeological sites.

Considering the religious factor and taking into account that human settlements have always been – first and above anything else – places for a complex social interaction, we must notice two aspects with

⁷ “Mesoamerica” is a term that defines a complex and polemic concept common to the scholars who study the ancient cultures and civilizations before the arrival of Spanish conquest in early sixteenth century. It refers to an enormous variety and diversity of cultures, whose chronological span extends from at least Early Preclassic (about 3000 B.C.) till the very end of 15th century. Geographically, it occupies a vast region whose limits are continuously discussed by archaeologists and historians; roughly, it goes from slightly north of the Tropic of Cancer (Mexico) down to the Motagua Valley in Central America (Honduras).

ontological and epistemological implications. First, the settlements are in continuous change, they grow, they get more complex, and they absorb the impact of new factors generated by the internal transformations of the social structure. As I suggested above: if at its beginnings a settlement was created starting from mythical maps and cosmic traces, in its late phases the cosmological map is mitigated under the inevitable mutations that come from continuous spatial dynamics. Second, in order to understand well and explain the conformation of archaeological sites, it is precise to differentiate between the *subjective* space (the ideal space, as proclaimed by the ideological discourse) and the *objective* space (the real one, the physical one as built by causal factors generated inside the social structure).⁸

The studies of Drennan (1988) and Fedick (1992) are of great relevance for the society-based explanation of the structure of human settlements. Drennan seeks the causal relationship between agricultural productive practices and the compact or disperse spatial patterns, using as a particular field the ancient Maya society. He starts from a widely known and over-used argument that stipulates that Mayan settlement pattern owns its characteristics to extensive agricultural practices like slash-and-burn techniques still used by modern farmers in jungle environments.⁹ He reaches an opposite conclusion: the cause for a disperse pattern was the intensive agriculture. Drennan discusses an idea previously sustained by Sanders (1981), which affirms that the necessity of high labor inputs asked for installing the households close to agricultural fields. The society looked for raising the settlement in places suitable for agriculture so that the intensive agriculture was practiced near houses, while the extensive agriculture and the plants that required of less attention were cropped on further places. The presence of such *infields* scattered among households caused the formation of a disperse pattern. Drennan wrote: "(...) the natural tendency to locate close to neighbors could become an unattractive alternative to farmers spending very large amounts of time on relatively small plots of land (op. cit.: 286). This idea is also important for the context of archaeological settlement proxemics (cf. Ardelean 2001, 2000-2001, 2008).

The author specifies that archaeological data from the Mayan site of Cerros (Belize) show that there is a clear connection between the shift to a disperse pattern and the construction of a large draining system connected to new intensive agricultural practices. Beside that, we could also remember the case of another Mayan site, Caracol (also in Belize), where the data suggests that the clusters of elite households are disposed in a manner that would allow them to control the production on artificial agricultural terraces (Chase and Chase 1992).

Another aspect that causes the positioning of houses on an agricultural field is, beyond labor input requirements, the concentration of fields in relatively small surfaces. Drennan believes that the main causal factor for the disperse settlement is the intensive agricultural production in lots inside the habitation area and so the living sectors of the site turn into mixed production-reproduction areas. Such a proposition is hugely important, but there are at least two critics I could make to Drennan.

First critic: he ignores the essential causal factor and this is the system of property social relationships. Without considering the system of properties, it becomes impossible to talk about the management of infields and the articulation of fields and household areas. We cannot reduce the

⁸ In this article the lecturer can notice several times an emphasize on the concept of "explanation". According to archaeological epistemology (as promoted by the American New Archaeology and extracted from the postulates of the Hempelian positivism), explanation is the identification and articulation of *causes* and causal processes and factors that underlie social and natural phenomena. The description and chronological ordering of facts are *not* explanations by itself! The fundamental goals of archaeological investigations must be explanation and interpretation of phenomena.

⁹ "Slash-and-burn" agriculture is the most common agricultural practice used by ancient Mayas in order to seed their milpas (cornfields). The agriculturer cut the trees down, set them on controlled fire and then mixed the ashes with the soil in order to improve its productivity. Jungle soils are poor and very thin and they depend entirely on the presence of great quantities of vegetation from which it obtains its nutrients. When the jungle is cut down, the soil cannot obtain its nutrients and decays. In the slash-and-burn agriculture, the recommended cycle was 20:1. That means that after one year of cropping in a given surface, they had to leave that piece of land allowing the jungle to grow again. After 20 years, that specific surface was cleared again. That is how the Mayan agriculture was "extensive", because they need more and more surfaces to clear for an increasing demography. Although we are sure of some "intensive" agricultural alternatives, most of the food came from extensive cultivation and that led to the terrible ecological destruction at the end of the Classic period.

argument to the quality of the soil and the energy inputs. Second critic: Drennan focuses the disperse/compact dichotomy in terms of demographic density, allowing himself fall in “calculistic” fashions typical for the processual archaeology and still obvious in many academic cores; especially in Mesoamerican archaeology. I have serious doubts about the relevance of demographic estimations¹⁰. For example, Maya archaeology traditionally assumes an average of 5.6 persons per house, a number deduced from archaeological and ethnographic data. Such a strictly demographic approach does not take into account the spatial distribution of houses, ignoring the dialectic relation between architectural structure and space unit. He does not deal with the multifactorial causality of settlement patterns and the variability it produces in elements of the physical dimension of space.

Fedick (op. cit.) manages a similar approach, also for the Mayas, analyzing the relationship between the emplacement of structures and the internal settlement pattern in connection to the soil quality. He is interested in the pattern of distribution of structures among the edaphic resources taking into account some variables like type of soil, soil sustainability, the crops that could have grown there and the social position of households. It is a valuable approach and a new theoretical achievement about the interpretation and explanation of Maya particular settlement patterns, but it still remains as a limited unifactorial approach.

One of the most important multifactorial explicative models is Trigger’s (1967, 1968). His work, besides emphasizing the three integrative levels of settlement pattern analyses (1. the individual structure; 2. the relationship between the structures of a site; 3. the layout of communities across the landscape), proposes a model for explaining the spatial conformation of human society based on the complex articulation of distinct determinant factors. For Trigger, the *determinants* mean “those classes of factors that interact with each other to produce the spatial configuration of a social group” (1968: 53). This definition establishes a link to the concept of social space. According to this author, a settlement pattern can be the compromise between a number of opposite determinants. There are also other factors that are not determinants but dependants, which mean they born as effects of the significant and necessary interaction of causes.

Trigger orders the presentation of the determinants according to his three levels:

In the case of the individual structure, the structural configuration of the building depends on the following factors. First, the subsistence of the society; it includes essential aspects of economic life. Nomads, author says, would have houses that are easy to build and transport. He insists on the close relationship there is between environment, kind of construction material and type of house. A house is the intent to respond to the challenges of the environment. Next there are the climatic factors (temperature, humidity, water availability, altitude, latitude, precipitations), the abilities and the degree of knowledge about the environment and construction techniques, family structure and kinship (establishing the size and the distribution of space inside the household), institutionalism, the status differences between occupants, the functionality of the structure, the economic specialization, religion. He adds political institutions, and also the esthetic tastes and the fashions of the moment.

The site level (*community layouts*) characterizes by the interaction of another series of factors: the extension, the size of the settlement gets limited by the ecological factors and the efficiency of the available technology; water availability and the quality and quantity of food resources; the safety of the place; the appearance of the place (almost always ignored in archaeological interpretations, it is obvious that a nice place could be preferred over a less nice one); the quality of the soils. A certain importance is given to kinship systems, which can influence significantly on the spatial distribution of dwellings and spaces associated to social groups definable through the kin criteria. Trigger also thinks of the presence of different ethnic groups, religious and social segments and classes, and that could determine the existence of separate zones distinguishable by visible features. The author believes that residential zones pertaining to groups defined by economic criteria are more easily identifiable than ethnic groups. I totally agree him: ethnicity is an extremely hard to find item in archaeological record. Many times archaeologists adopt simplistic ways by considering archaeologically identical the cultural and the ethnic identities. Among

¹⁰ That is because most of demographic estimations are made upon surface data. We cannot estimate population size and density until we establish precisely the contemporaneity and functionality of the architectural structures.

other factors that Trigger mentions we have: subsistence-related factors, economic specialization of the community inside a net of regional interchanges, elements of status and social organization, the specific functionality of the structures, the development of complex political organizations and finally, cosmology.

For the third level (regional patterns), there is a higher emphasis on environmental factors, because the density and distribution of settlements across a region depend primarily on nature and resources availability. Ideally, people avoid areas with scarce or no resources¹¹. The regional patterns are widely led by economic factors as trade; that mean people would search installing in point along trade routes. Some other important factors are warfare, politics, buffer areas between conflicting settlements, tastes and customs. Trigger considers that the relevance and importance of factors vary according to particular situations. He also assumes that to any of the three levels we can add factors as migrations and demographic changes.

In conclusion, Trigger identifies three types of determinants that apply on all three integrative levels of human settlements: ecological, political, and religious¹². This integrated multifactorial approach is of great importance for the corpus of explanatory theories about settlement patterns, but we can notice that it lacks an emphasis about the manner factors interact and articulate among themselves. Anyway, it remains one of the best models so far.

Brüggemann (1991a, 1991b) is one of the most relevant researchers about the theories of space in Mexican archaeology. He offers a multifactorial approach of great importance for the conformation of a richer theoretical-conceptual explicative body for the internal structure of the settlement patterns. The articulation of factors the author proposes refers mainly to the second analytical level, the settlement itself.

Among these causal factors, the first place is hold by the natural configuration of the land, which “offers supposed particular architectural and urban solutions and in general the natural environmental conditions where a human settlement rises” (1991a: 84).¹³ A determinant position belongs to the natural sources of raw materials and the natural sources that offer the base for an economic activity that marks the way of life of the community. Some soils are more suitable for certain crops than others are, while the presence of minerals and rocks of socio-economic utility help stimulate the integration in trading nets. Some important factors related to characteristics of the environment and of the topographic layout, to availability of water sources, are factors that influence more heavily on the shape and constitution of the elements that integrate a settlement; specifically, we could name the construction material people use, the dimensions of the architectural structures, the building system, etc.

Brüggemann makes a difference between external (or natural) and social causal factors. The external factors are mainly natural, while the social factors “represent the internal world of the society”. The observation author makes is essential and I agree it: “The natural factors are simply the starting point whose destiny is to be changed by the activities a human group realizes in a region” (Íbidem).¹⁴ Every human settlement depends on the social, political, economic and cultural characteristics of the society it belongs. Brüggemann rightly criticizes the theoretical postures that adopt an ecological determinism based on the idea that spatial manifestations of human society manifest only human adaptations to environmental stimuli. The environmental argument is logical, simple on a superficial level of analysis, but “not necessarily true in a multifactorial context”. Allying myself to author’s opinion, I agree that if we adopted such a position and if we saw the human settlements exclusively as effects of natural (external) factors, then we would be very close to falling in ontological postulates parallel to human reality, disconnected from it, and start explaining human space and human phenomena through principles that

¹¹ Anyway, we know that this is not the case with many human settlements in inhospitable areas around the world and that people not always can choose the place to live. And there can be cases of communities living in zones that are very rich in resources but they do not have the knowledge or the technology to exploit them.

¹² The symbolic factor is almost absent on the regional level, although I think that this could be an important factor in imperial states that found new settlements according to plans led by ideological principles related to the mechanisms of maintenance and reproduction of power. We can also notice in Mesoamerican cases that settlements are sometimes set in places that have good position for astronomical observations and in certain kind of relationships to natural features (peaks, hills, caves) loaded with symbolic charge.

¹³ My translation from Spanish.

¹⁴ My translation from Spanish.

rule the nature in general. It is true that, in certain manner, humans are animals too, and they are part of the greater nature that surrounds us. But it would be completely dangerous to adopt biological explanations in order to understand the behavior of human societies. Some theoretical currents already fell in such sad traps, for example the human ecology.

Brüggemann's approach is not unilateral at all. He does not deny the importance of natural factors derived from environmental conditions, but he prefers to emphasize the causal action of the social factors (including economic and cultural ones) that interact between each other and with the external factors inside a dynamic frame marked by a large number of variables:

Le doy mucho más peso a las condiciones internas y sociales para la estructuración y configuración de un asentamiento, aunque no excluyo ni trato de negar que el marco geográfico ambiental influya. Lo considero más bien como un marco de referencia en el cual habrá muchas opciones de soluciones y desarrollos que corresponden, en último término, a un proceso social con su propia lógica, y no a un proceso mecánico y natural. (...) Es imposible llegar a conclusiones sobre los asentamientos humanos sin tomar en cuenta el conflicto permanente dentro de la comunidad, sin pensar en los sujetos que actúan, con razón o sin ella. La complejidad de los factores que interactúan y el gran número de variables nos salva afortunadamente de simplificaciones tan erróneas como las de algunos colegas que insisten en que la expansión demográfica es el estímulo para que los sistemas sociales cambien, enunciado que hace patente el desconocimiento de los mecanismos sociales y su proceso de cambio. Lo que de hecho es uno de los efectos de un largo proceso se confunde con el proceso mismo (idem: 11-12).¹⁵

The influence of the natural factors is limited by the intervention of social factors as the degree of technological development, the social organization of labor, the social relationships of production, the esthetic categories, the value systems adopted by the society, and the kinship system. Other two factors of great relevance are the mode of reproduction¹⁶ and the physical capacities and/or abilities of the inhabitants; these social aspects obstruct the manifestation of activities that go beyond such capacities or beyond the necessities of the people.

Brüggemann proposes the existence of distinct areas inside a settlement, which are the materialization and concrete spatial projection of distinct fundamental aspects that constitute the social dynamics. "The mentioned areas explain in general terms the structured whole of a settlement but not its functioning" (idem: 13).¹⁷ The functional mechanism gets clearer when we introduce into the study the vaster spectrum of components of the social structure, especially those that has to do with the superstructure and with what author call infrastructure in order to refer to that sum of services that support the functional integration of social components¹⁸. The symbolic or semiotic factor is perceived as an important but a secondary social factor, as the manifestation of "a language that regulates the behavior of the population", a language obviously linked to the superstructure, to the management of space in benefit of the elite class.

¹⁵ "I give much more weight to the internal and social conditions for the structure and conformation of a settlement, although I do not exclude nor deny the influence of geographical frame. I rather consider it as a reference frame that surrounds many solutions and developments that correspond to a social process that has its own logic, not to a mechanical and natural process. It is impossible to reach conclusions about human settlements without taking into account the permanent conflict inside the settlement, without thinking about the subjects who act, rightly or wrongly. The complexity of factors that interact and the large amount of variables save us, fortunately, from such erroneous simplifications as those managed by the colleagues who believe that demographic expansion is the stimuli for the change of social systems, a statement that proves lack of knowledge about the social mechanisms and their processes of change. What actually is the effect of a large process gets confused with the process itself" (translation and adaptation are mine).

¹⁶ "Mode of reproduction" (modo de reproducción) is a concept manifested in the Marxist and Neo-marxist archaeology in Latin America and refers to the sum of necessities and motivations that support the productive activities. For instance, as a part of the mode of reproduction, we could mention the biological reproduction, the need to eat, to sleep, to have certain level of life, the kinship, the culturally induced needs and so on. All these needs resumed inside the mode of reproduction form the motivation for the production processes.

¹⁷ My translation from Spanish.

¹⁸ "Superstructure" is a higher analytical level of the components of the social dynamics and refers to ideology, official discourses, mentalities, norms, rules, laws, principles, religion, beliefs, sanctions, etc.

Finally, we conclude together with the author that “la integración de estructura, forma y function en el diseño de la investigación urbana nos permite llegar a una visión totalizadora de lo que es un asentamiento y reconocer las características generales y particulares de una comunidad que se ha manifestado en el pasado” (Íbidem)¹⁹.

III

In the position I manage in this article, I assume (although not identically) as theoretical background the integrator approaches presented above and corresponding to Trigger and Brüggemann, respectively. The causal factors that each of these authors sustain constitute an articulated and explanatory scheme, in spite of the lack of some more emphasis on the actual functioning of the models. My personal approach has a similar and still, somehow, a different hue, but it does not exclude nor contradict the two mentioned previous theories.

From the beginning, I announced that I always preferred the term *causal factors*, not “determinants” as many authors do. I am deeply convinced that talking about determination (deterministic ontology, implicitly) in the context of the conformation of settlement pattern structures generates a sort of epistemological breakdown that cancels the very idea of dialectics, leaving room for unifactorial approaches that, as Brüggemann showed, are limitative, simplistic, and scientifically dangerous. I believe that the term “causal factors” is more appropriate, because it implies the identification and analyses of causal relationships inside the particular manifestations of the social space, and it admits the complex and bidirectional between different categories of variables inscribed into the dynamic frame of interconnected social processes.

The human settlement – no matter its concrete form, structure and details – is a component part of social space, and it is its clearest physical manifestation. By the way, I also pronounce myself for the social causes as superior to the natural ones. Settlement pattern, as formal expression of social space, represents the image of the particular dialectic interaction between the distinct socio-spatial levels (also essential components of the social space), which imprints on the integrant elements of the physical dimension of the social space (which is a relevant synthesis of the physical-natural and physical-produced dimensions of the respective socio-spatial levels involved), and it is horizontally regularized by the functional combination of the physical extensions of the socio-spatial levels.

That means that a settlement pattern is the effect of a causal process generated by the dialectic and socially significant interaction of the socio-spatial levels that integrate the social space. The distinct causal factors of social kind represent, in fact, the components of the causal impact on the level of the physical dimensions absorbed into the social dynamics that manifest around the socio-spatial structure. The complexity of variables in the conformation of the space depends on the complexity of variables inside the social structure. The natural and social aspects that could be inferred through the archaeological record of ancient settlements are actually concrete manifestations of the causal factors; they are those factors themselves, but reversed.

I will present below a series of factors that I consider more relevant in the constitution and structure of ancient settlement patterns. I will try not to repeat things that have already been treated with more or less detail by other authors, and I will intent to stress some personal considerations.

The natural environment

The most important causal factors for human settlements are: the pattern of climate elements (precipitations, wind, etc.), quality of soils from, and the mineral and biological resources available in the region. All these factors should be considered as components of a greater factor, the environment itself. The existence of these subfactors occurs through a narrow and continuous interrelationship. The

¹⁹ “The integration of structure, form and shape in the design of the urban investigation allow us achieve a totalizing vision of what a settlement is, and recognize the general and particular characteristics of a community that manifested in the past” (the translation is mine).

environmental factors influence the positioning of a site in a region more than its internal structure. It “determines” its specific relationship to landscape and surroundings, its orientation to the cardinal points, the winds, or topographic elements.

Natural (environmental) factors alone cannot determine nor decisively influence the form and structure of a settlement pattern. They enter in reciprocal contact with two basic aspects of the social dynamics, first with the degree of development of labor forces. The presence of certain mineral or biological resources around an archaeological site does not allow us to assume that the ancient inhabitants of that site actually exploited them. The presence of some kind of raw material for dwellings is not enough for a site to affect its form and adopt correspondent manifestations; the essential thing here is an adequate technological (tools, abilities) and cultural (knowledge, will, perseverance, customs) competence. As a Romanian proverb says: “God may give you something, but He won’t put it in your bag”... Culture, social organization and technology are the necessary keys to make natural resources become relevant. Second, it meets the production mode of the society and its particular manifestations on the level of “mode of life” or “way of life”. As a parenthesis, if the production mode (mode of production) is hunter-gatherer, then a corresponding “way of life” is swamp hunter-gatherers, or desert hunter-gatherer; the way of life makes reference to the particularities (with environmental and social implications) that a production mode may adopt. As a still tighter category we have “mode of work” or “mode of labor”, which refers to the specific customs, tools and behaviors that differentiate between groups and people belonging to the same type of “mode of life”. As already said, the use of natural resources and the degree they act upon the formation of a settlement pattern are limited by the cultural factors, like traditions, abilities, knowledge about the environment and its potential, customs and fashions, etc.

We cannot underestimate the causal power of the environment. The ecological current in archaeology, although officially pronouncing themselves against ecologic determinism, have always overvalued the supposed relationship man-environment based on a sort of harmonic equilibrium. I insist here, repeatedly, that there is a priority of the cultural factors over the natural factors, far beyond the implications of the technological management of the environment proposed by Julian Steward (1955) at the beginnings of cultural ecology. Knowing how to employ the environment depends primarily on the cultural inheritance of the group, on the environmental education individuals have received; this education or training represents a sort of homeopathic mechanism generated through the unstable balance between the cultural tradition and the cultural change, this last one being sometimes stimulated precisely by the environmental challenges. The presence of a series of resources highly useful to the community does not imply their automatic utilization by the people unless they have the knowledge and the right technology and socio-economic milieu for that. Nor is the richness of the environment a clue about the hierarchy of resources in the diet and practices of the community. On the other hand, it is also true that the environmental approaches in archaeology cannot run away from the ghost of “presentism”, that means that scholars who think in those terms use to focus more on those aspects that are more familiar to them, more obvious and more accessible through the observation of present-day behaviors in occidental or traditional societies, employing anthropology techniques and ethno-archaeology as auxiliary. For instance, erroneous approaches in cultural ecology manifested as the sustainability estimations, sustainability potential or “carrying capacities” of certain regions and geo-cultural areas. Such estimations usually were built only on some aspects, especially the agricultural ones, completely forgetting and ignoring many other subsistence activities like hunting, gathering, fishing, trading. Such calculations – based on environmental data and less on information extracted from the corresponding archaeological record about the actual exploitation or not exploitation of those resources – become guilty of theoretic reductionism, because they enclose the socio-cultural behaviour of human groups and societies in formulas that are supposed to have universal applicability.

Unlike natural or so-called exact sciences, the observational and study object of archaeology is human society with its infinite manifestations around the globe and through time. Our observation data are extremely variable and complex. An atom of helium does not change its attributes in Mexico or China; a water molecule looks and behaves the same in the atmosphere of France or in some river in Eastern Europe; the carbon isotopes have the same characteristics in Africa or in Asia, today and tomorrow and the day after tomorrow. Human society has as many variants as the number of human groups and cultures that have ever existed on Earth. We cannot enclose or predict human behavior in

mathematical formulas, and those who believe we can be practicing erroneous epistemology about fake ontologies. There are for sure aspects of human behavior, of human culture and of social life which could possibly be expressed by formulas and in mathematically predictable ways, but those aspects situate in such general levels that they cannot explain anything about the particular manifestations of the phenomena.

The demographic estimations commit a similar or even more serious mistake. In the American archaeology of the last three decades, that became like a fashion born from cultural ecology and processual approaches. Sometimes, palaeo-demographic estimations turned into an inferential ritual in archaeological investigations. Actually, knowing the number of persons of a determined place during a determined span of time does not offer too much information by itself about the dynamics and functional mechanisms of the societies. In fact, the critics we use to make on archaeological demographic studies do not imply any denial of its scientific relevance; it rather has to do with the variables it employs. The worst and more risky path to choose is believing that there actually is some truth in making population estimations starting from the sustainability or carrying capacity of the environment. Such a method generates not only very weak conclusions, but also a dangerous trust in a false ontology. Through this method, we cannot infer the real demographic values present in the objective reality we focus on.

When the demographic calculations start from the settlement pattern of a region or of a site, many times scholars used to do it employing surface data. There is no sufficient space in this paper for me to enlist all the arguments about why surface archaeology has extremely low inferential and interpretative potential. Surface archaeology is an important, imperative and obligated phase in archaeological research. Ignoring it is starting wrong. Nevertheless, it is very limited in its potential. It is a phase, a step, the correct manner to commence, but it cannot be an ultimate goal nor should it ever be the name of a theoretical-methodological current. Making demographic calculations after recently discovering a site or even after doing the mapping and topographic work is always a precipitated goal. Before talking about population size and density, we *must* solve at least three fundamental aspects of the settlement pattern: a) the functionality of the architectural units that are to be used for demographic estimations; b) the temporality of the same structures in order to understand which are contemporary to each other; c) the models of use of space together with the proxemic behavior of the studied culture, of course, if this last aspect is inferable from some corpus of indicators previously established.

In an earlier work, I tried to elaborate a model of the dialectic functioning of the social space based on the articulation of a hierarchy of social groups defined on the criteria of production and the kind of products they offer to the society they belong to, and I called the "Determined Social Groups", because somehow their existence and their participation in the community life is determined by the needs that breed out the social structure (Ardelean 2001; 2003). It would be far too complicated to discuss all these aspects in detail in these pages. Anyway, it is easy for anyone to understand that, if the social space is a synthesis of elements that compose the physical-produced dimensions of the determined social groups that constitute the socio-economical spectrum, then that is how we must comprehend the internal articulation of a human settlement. This has to do with a basic stuff in archaeology: the *functionality* of the structures. Like in artifact archaeology, there is no use for us to know only the chronology and typology of the objects and architectural units, we must search for their functionality, we must understand how they were used and what they were built for. Structure functionality, a socially relevant quality, is given by the integration of the anthropic element (an architectural structure in our case) into the physical-produced dimension of the spaces designated to a certain social group, where it accomplishes a function that is essential for the functioning of the group (cf. Ardelean 2003).

After discarding the superiority of the environmental factors in the structure of settlement pattern, I consider that the spatial articulation of a site is led by three great causal factors: a) property relationships; b) proxemic patterns of individuals and groups; c) superstructural regulations.

Property relationships

Property relationships are a fundamental aspect of social processes, the base that supports the whole system of labor relationships. It is one of the most important causal factors of the articulation of components in the physical dimensions of the socio-spatial levels, and it is impossible to explain the

spatial distribution inside a settlement without taking into account these relationships. In certain way, the property may even supplant, on causal level, the environmental and religious factors.

Lumbreras wrote: "our first contact with the 'outer environment' is determined by property. Its limits are the limits of our action" (1981: 122). Harvey details the problematic unequivocally in a memorable paragraph:

Yo no puedo existir sin ocupar un espacio, no puedo trabajar sin ocupar un lugar y sin hacer uso de los objetos materiales localizados en ese lugar y no puedo vivir sin una vivienda del tipo que sea. (...) Un atributo importante del espacio físico es el de que dos personas o cosas no pueden ocupar exactamente el mismo emplazamiento y este principio, cuando está institucionalizado como propiedad privada, tiene consecuencias muy importantes para la teoría del uso del suelo. (...) el suelo y sus estructuras han sido históricamente el depósito más importante de valores almacenados (1979: 164).²⁰

A similar posture is Earle's, on a position more tied to archaeologically observable reality:

Within settlements, the constructed landscape of houses, paths, walls, and monuments formats the localities of families and larger social groups. Perhaps most immediate is the significance of residential structures and the use of walls to create privacy and private spaces through obstructing the public gaze. Archaeologists can study how private space is demarcated in the fencing of farmsteads and yards and in the internal order of the buildings (2000: 52).

Property relationships, whether institutionalized or not and without depending necessarily on the forms of property that a given society might get to know, have influenced constantly, along history, the management of resources, the use of land, the distribution of land within the society (cf. West 1972; Robinson 1979). Property relationship system is the glue that keeps together the components at the base of the society.

Following Earle's idea mentioned above, I would say that, as I cannot live without using a space, neither can I occupy any place I wish. No matter the society where I live, it is true that I am not allowed to build my house anywhere I want, nor to labor any piece of land, nor use freely any segment of space. Any of these aspects is regulated through the property rules whose concrete manifestations occur according to the principles stipulated by the society that surrounds me.

We noticed before that some approaches like Drennan's or Fedick's recognize the relationship between the location of the architectural structures and the quality of the soil, or for example the proximity to exploitable natural resources. Nevertheless, the presence of rich soil of high sustainability, the proximity to water or to intensive agriculture terraces are not sufficient arguments to explain and understand the location of certain architectural structures in a given spot. In many cases, in societies familiar to change values, additional explanation help could come from the actual prize of the land.²¹ For instance, a corner of my settlement probably has highly fertile soil, a nearby spring that allows fine irrigation and water supply, and also a piece of forest perfect to exploit timber. Although it sounds ideal for settling, those are not sufficient for me and my roaming family to stop there and occupy the place. The reader surely remembers that a few pages earlier I insisted that the simple presence of good resources is not enough for a good level of life, because certain level of technology, culture, and social organization are required in order to exploit them. In this other case, the presence of resources is not enough because I must respect the property system valid in the area, the cultural psychology and locals' behavior. The property system above all would tell me, to whom the place belongs, if it is on communal property or possession, if there is private or particular property exercising on it, which the available ways are to obtain profit from its use, etc. That is why, on archaeological researches, the location of a household near

²⁰ "I cannot exist without occupying a space, I cannot work without occupying a space and using the material objects located in that place and cannot live without a shelter, whatever it might be. (...) An important attribute of physical space is that two persons or things cannot occupy exactly the same spot and this principle, when institutionalized as private property, has great consequences for the theory of the use of soil. (...) soil and its structures have been historically the most important deposit of stored values" (my translation from Spanish version).

²¹ See Raper 1977, for the case of ancient Pompey in Roman Empire.

fertile soil or intensive agriculture infrastructure does not imply a direct causal relationship and it is by no means an automatic explanation of an aspect of the settlement pattern. But of course, such an ideal case would be anytime a valorous empirical help for the study of the ancient systems of property.

The structure of a human settlement, from the perspective of the causal relevance of property relationships, relates to the forms of property over land and the position of every “determined social group” on the scale formed by the system of relationships generated around it. By “land”, I understand not only the surface of the settlement or the surface where dwellings are built, but also the farming lands, non-farming soils, natural resources, water supplies, etc.

The problem of property relationships as essential causal factor for human settlements is complex and it cannot be treated here extensively. Additionally, the study of ancient property relationships through archaeological record is a very difficult task. It is very necessary to insist further on such an issue that I consider fundamental for the explanation and the comprehension of human society and for the development of solid and coherent theoretical schemes able to explain the functional mechanism of the complex relationships and processes that occur in connection to property between the various levels of social integration. For example, which is the relevance of property relationships at the level of the producers themselves, how the property acts within the interaction between social groups, etc. These are just a couple of questions that form the complex and complicated portrait of a dense problem that is worth studying from the positions of archaeology. As Earle said, “archaeologists must investigate property cautiously but with whatever means available” (2000: 53).

The archaeological indicators for the forms and relationships of property are still not very clear and they require solid theoretical elaboration and systematization.²² We could try to enlist some of these archaeological indicators.

The concrete manifestations of property relationships can reflect into the space between structures, internal aspects of compact or disperse patterns, landmarks, land delimitations, or surfaces occupied by structures and nearby areas. For example, in the case of disperse settlement patterns in agricultural societies, the distance between houses probably owes, at least in some cases, to infields characterized by private or particular property. The presence of walls around households has better opportunity to be explained as manifestation of property. Dry-stone walls, mud walls usually are intentional delimitations of some form of property or possession, and they are visible in some cultural areas in Mesoamerica, for example, for Pre-Columbian times, in the Maya site of Becan, where the “linear mounds” could have been raised fields for intensive agriculture with a second functionality as land markers (cf. Thomas 1981). Such spatial features use to be some of the best archaeological manifestations of land property, and a good example of how property forms can influence on settlement pattern.²³

In archaeological excavations, stratigraphic record may reveal cases when a structure was built on a place previously occupied by other structure destroyed for this purpose. An elite structure that lies over a surrounding place can do it over an “empty” or free space or above the ruins of a humble hut demolished. Those might be *possible* indicators of property relationships. There is no such think like “archaeological evidence”. Nothing is evident per se in archaeology. Therefore, we will probably never have solid, definitive and critic-proof indicators of property relationships. If we situated on Popper’s epistemological fallibilism, then we could take into account any small group of discoveries, any association of data as conjectures, as work hypothesis. As a brief commentary, it is important to understand that in archaeology (in science, in general) it is not recommended to wait indefinitely for a sort of Great Discovery, a sort of ultimate proof to confirm the expectations of our beliefs. In archaeology, there is no definitive or absolute answer to our infinite questions. All we have, always, is conjectures, hypothesis, and suppositions with larger or smaller representation on actual archaeological record.

Earle (op. cit.) deals with property relationships in ancient societies and their manifestation in archaeological record. This is one of the scarce cases of scholars dedicated to such “unusual” issues. His opinion:

²² “Archaeological indicators” is a concept that defines the kind of empirical data we expect to find in our excavations in order to corroborate our theories on field.

²³ For additional discussions about the issue, see Ashmore 1981, Barrera 1976, Benavides 1987, Bullard 1952, Harrison and Turner 1978, Manzanilla 1987, Silva and del Carmen 1991, Vlcek et al. 1978).

Property is a key concept and behavioral mechanism to limit and direct the use of things. (...) Natural resources, tools, products, and at times people are subjects to property rules (...)

A common definition of property is twofold: something possessed, and the exclusive right to hold, use, and/or dispose of that something (idem: 39-40).

The posture of this author is a very useful guide for the social approaches in archaeology and requires no further clarification:

I review different research directions that deal, often indirectly, with property in prehistory. I (a) highlight the theoretical significance of property in both materialistic and institutional approaches to human societies and their long-term histories, (b) provide case examples of the primary importance of property in several proto-historic societies, and (c) explore how archaeologists describe property relationships without a written record (idem: 40).

Earle proposes three independent sources for the archaeological study of property relationships: 1) the transformation and circulation of cultural artifacts; 2) the warfare patterns associated to the emergence of property relationships and that might have been caused by the intensification of the agriculture and the rise of the prices of land; 3) the patterns of distribution of human settlements in the environment and the distribution of artifacts related to them, considering that "settlement studies imply concepts of property in land"; 4) the land delimitations and the property marks on objects, as indicator of property exercised by individuals and groups (idem: 49-52). Nevertheless, in spite of his important theoretical proposals, Earle's approach lacks clear interest in the relationship between property systems and settlement patterns on causal level.

In conclusion, property relationships influence considerably the constitution of the settlement patterns, while the settlement pattern, because of the reciprocal complex relationships manifested inside the social space, contribute to the reproduction and/or transformation of property relationships.

Proxemics

In my recent publications, I dedicated plenty of pages to an almost unexplored interesting problem: proxemics in anthropology and especially in archaeology (Ardelean 2001; 2000-2001; 2008). I employ the word "proxemics" to refer to the discipline founded by the anthropologist E. T. Hall (1966)²⁴, and also to name the spatial human behavior. In this section of my article, we will explore together the potential of proxemics as causal factor in the conformation of settlement patterns.

I will not discuss again on the classical studies of Hall, Sommer or Watson, because they were largely treated in my above-mentioned bibliography. In those contributions, I used to stress repeatedly the existing relationship between the spatial behavior of man and the physical structure of his anthropic environment. For the mentioned authors, architecture and space within settlements were a sort of language that reflected the "sensorial world" of the culture that created them. Anyway, proxemics, as it was thought by its initiators decades ago, recognized the causal relationship between the human behavior in space and the shape of the component elements of the created dimensions of social space. It was evident in Sommer's and Watson's definitions of the analytical levels of proxemic space.

Martin (1972) shows an ecological position and that is why its approaches on proxemics do not differentiate too much from ethology.²⁵ Although he does not expressly discuss the causal relationship between behavior and space, he agrees we can find in archaeological record the fossil remains of past behavior.

The proxemic pattern of a culture (and its particular manifestations within a given community) is an important causal factor for the internal constitution of a settlement. Compared to property relationships, this factor is secondary. Property relationships are thought to have priority in the conformation of the physical-produced dimension of social space. Proxemics comes after that and influences the form of spatial units, their shape, size, the distance between architectural and spatial units, the degree of

²⁴ "The Hidden Dimension", the classic E. T. Hall's book considered the founder of proxemic approaches.

²⁵ Ethology is proxemic's sister discipline, and it studies behavior and space relationships among animals.

dispersion or compacting of the settlement, the *sociofugal* or *sociopetal* character of the conforming spaces.²⁶ Proxemics regulates the way space constitutes internally, after the property relationships have established a basic structural frame for the settlement's areas.

Layton (1972) makes some relevant considerations about the issue. This author takes into account Tönnies' concepts of *Gemeinschaft* (a community's natural or original form) and *Gesellschaft* (association or society, in contrast to the first). Proximity of structures, of communal fields, the clustering of structures they all generate close contact between humans and stimulates better reciprocal knowledge among them. For instance, in the case of a communal form of property or possession over land, there is a reciprocal relationship between property relationship and the proxemic pattern that create the circumstances for a close spatial proximity of productive agents.²⁷ Layton quotes Tönnies: "Those who love and understand each other remain and dwell together and organize their common life, their activities revolving around the possession and enjoyment of common property" (op. cit.: 377).

Castells (1980: 118) suggests the causal relationship between proxemic behavior of social groups and the space they occupy in modern urban environments, and it manifests as distinct behavioral environments for every socially relevant spatial unit (as quarters, neighborhoods)²⁸ associated to group identities: "The daily reactions are full of associations derived of certain experience and according to which this quarter corresponds to a popular way of life, the other is 'bourgeois'(...)". It is worth mentioning that for Castells the term "way of life" or "life mode" does not have the same significance as in Felipe Bate's (1998)²⁹ models (who understands it as a particular manifestation of a production mode); he rather sees it as "lifestyle".

The proxemics of individuals and productive agents generates effects on smaller levels of the settlement pattern, as the household, activity areas, workshops, etc. The proxemics of social groups infringes effects on higher levels of space, on the very structure of the settlement. The physical-produced dimension of social space synthesized on the level of the human settlement receives the causal impact of the intersection between the proxemics of determined social groups (socially relevant productive groups) and that of social groups defined through some other criteria. There could be groups define by economic power, religion, ethnicity, etc., and those develop their own proxemic patterns based on constitutive elements of their own identity, and that can further reflect within the settlement as characteristic spatial forms and structural patterns.

According to Fletcher (1977), we could think of proxemic patterns as unconscious causal factors for the spatial forms and for the distance that people keep between them as individuals, as groups. But there also is an important conscious element that makes that "identified regularities (within settlements) reflect the conscious use of that standard", involving the intervention of architects, governmental elites, priestly groups, etc. This is visible, for example, in the modern urban planning, in the urban planning of the antiquity, in the modules of the Greek, Egyptian, prehistoric architectures and so on. A paper is played by the local values and measuring units, which add formal effects to dimensions and shapes previously stipulated by the "unconscious" plan influenced by the proxemics.

The proxemics' causal value gets limited and regulated first by the property relationships, then by local architectural and urbanism patterns, and third, by superstructural regulations linked mainly to the ideological factor manipulated by the ruling elites and the discourse of dominant groups.

All the proxemic levels find expression in the spatial structure and the formal aspects of a community's settlement pattern. The effect of proxemics on human settlements is the combination of the effects caused within the physical-produced dimensions of distinct proxemic levels, no matter if

²⁶ "Sociofugal space" is a space where the elements are oriented outwards, for example houses with wide openings toward street, with open porches and small or no walls around the yards, etc. "Sociopetal space" is all the contrary, spaces oriented inwards, for example houses with no windows looking to the street, with the walking areas and doors looking to the interior patios, with high walls around the yards, etc.

²⁷ A "productive agent" is the minimum level of producer as assumed by the society. It can be an individual, but it can also be, in other cases, a family, or the workshop including the master craftsman and his pupils.

²⁸ Or what in Romania is called "cartier" and in Mexico "barrio".

²⁹ Luis Felipe Bate Petersen was my professor in Escuela Nacional de Antropología e Historia in Mexico City and he is one of the most important theoretical archaeologists in Latin America and a famous specialist in prehistoric hunters and gatherers.

corresponding to determined social groups or other kind of social groups. Nevertheless, I consider the proxemics of social groups has much more causal relevance in social and spatial dynamics than the proxemics of individuals. An interesting theoretical issue that is worth studying and refining through future models is how much is the proxemics of determined social groups (socially relevant productive groups) imposing over the proxemics of the rest of the groups.

Just like Castells, Harvey (1979: 28) notes, from the position of urban sociology, that in the physical dimension of the social space there are partitions related to the interaction of antagonist social groups. The author says that there are borders within settlements that individuals do not use to cross. They can be physical or psychological, and usually the official discourse and the ideological forces try to deny and hide them. For example, the strong limits (walls, streets, corners, valleys, imaginary lines) that separate white from black people, that separate rich from poor, an ethnic group from another, etc. This kind of separations is exactly the expression of the interaction of group proxemics.

Among the archaeological indicators of causal proxemic patterns imprinted in the structure of human settlements, we could mention the following: the compact versus disperse pattern; the density of dwellings on a space/time unit; clusters of buildings belonging to different social groups; differences of structure clustering between distinct areas of the settlement; distances between dwellings linked to different classes or social groups; distance between structures belonging to the space of the same productive group; distance and spatial relationship between structures included in the same spatial unit; volume of the interiors; the sociofugal or sociopetal character of the structures and the units they belong to; presence or absence of yards and patios and the manner they relate to dwellings; internal divisions inside buildings, their form, size, number, thickness, etc.; number and width of doors and windows; access facilities; difficulty or easiness of access; number of people that could have lived in the same structure simultaneously; the disposition of resting areas; relationship between working and resting areas; land marking and land delimitations; presence/absence of exterior walls that surround the whole unit or just a part of it; the degree of visibility and communicability between space units; the visibility and communicability of the units from outside (from the street, from the plaza, etc.); the width of streets and public places; estimated number of people able to circulate simultaneously on a given surface during a given span of time. These are ideal archaeological indicators and we cannot expect to find them in pure form nor should we expect to find them always in all the sites. Besides that, these features are theoretical indicators of proxemic behavior, but we cannot definitely assume that all of them always indicate only proxemic patterns.

Such indicators could be systematized according to proxemic levels, but a relationship between certain indicator and certain level is not rigid at all. As well as the proxemic levels keep an obvious reciprocal relationship, the indicators also can refer to one or another proxemic level. To remind it, the proxemic levels are the proxemic behaviors that we can find on different levels of social integration: individual, group, social group, class, etc.

It is important to say that land delimitations are an interesting and useful feature that do not relate only to proxemics but also and especially to land property and defense. Tringham (op. cit.) agrees about the multiple meaning of the land delimitations and their underlying causal factors and emphasizes territoriality as the social phenomena that usually causes these features.

I consider that, in order to infer the proxemic pattern from data extracted from a household, it is important to take into account the existing relationship between the surface of the household, the volume of the interior, the presence/absence of internal spatial partitions, the thickness of inner walls, the number and dimensions of openings (doorways, windows, porches), the differences of use between wall areas and central areas, the easiness of access, orientation of access and so on.

I am sure that several aspects of proxemic issue needed much more and eloquent discussion and analyses. I had to sacrifice clarity and maintain a decent amount of space for this theme, so I recommend the lecturer to read my previous article dedicated exclusively to proxemics and published in this same review.

In conclusion, the proxemic patterns of a culture (necessarily including certain particular features typical for the local communities that integrate the culture) represent an important causal factor of the settlement patterns, but they come to be influenced by the settlement patterns themselves in their continuity and transformation.

Superstructural factors

This is an important class of causal factors, but I suspect they do not use to have priority in front of the other mentioned primary factors. The superstructural factors limit and regulate the impact of property relationships, natural environment and proxemic patterns. In certain way, the superstructural dimension is related to property relationship system. Although we could imagine a settlement that is to be founded based on the geomantic principles of the ruling class, a previous regulation of property relationship over the land is indispensable.

The superstructural class includes a series of factors like following: social conscience, kinship relationships, religion, ideology (the “official” beliefs and principles of the dominant groups), mentalities, and politics among others. The ideological factors, organically interconnected with the others, refer mainly to mantic, symbolic aspects related to religion, magical beliefs, to the symbolic management of space and to elements assumed by the community and the groups that integrate it, groups that play as target for the ideological messages:

Los patrones de uso del suelo y de sus sectores, distinguibles en los niveles arqueológicos, el juego interior exterior de un recinto o de una vivienda colocada a cielo abierto, el emplazamiento de estructuras, rasgos y los acondicionamientos del espacio, con seguridad nos pueden orientar en la búsqueda de las evidencias de la resolución del manejo del espacio. (...) Configuraciones rocosas, árboles aislados, cursos de agua, fueron y son soportes de significados (Boschin 1991: 98-99).³⁰

It is the social space configured through the ideology; it is the symbolic dimension of the space. It is true that, in some cases, the beliefs about a place, its symbolic and spiritual values may impose as determinant over other factors and lead the configuration of the settlement pattern or the positioning and characteristics of ceremonial structures. The symbolic archaeology, one of the most famous currents of the post-processual archaeology, use to deal with this kind of situations. Anyway, it would be wrong to isolate this class of factors and make them the unique ones in the explanation of archaeological processes and sometimes the symbolic archaeologists use to commit this mistake. Symbolic, spiritual, shamanic reasons could be strong in the constitution of some anthropic spaces, but they never could stand alone in the epistemological approach.

The superstructural dimension depends on production relationships and, specifically, property relationships with regard to the conformation of settlement patterns, the divisions of the settlement, positioning of structures. Nevertheless, superstructure factors act more on the formal, morphological aspects of the dwellings and space units and on their functional areas and it can impose over the proxemic factors, even denying certain proxemic needs of the inhabitants. Sometimes, settlements show anomalies caused by the antithetic interaction between environment, property relationship, proxemic patterns, and superstructural factors. A social group inserted into the social matrix of a different community might use, among other resources, its proxemic patterns, its ideology and its property relationships in order to create a resistance against the assimilation tendencies of the society that circumscribes it.

Ending this theme, I insist there is no ontological or epistemological contradiction between emphasizing the production relationships as fundamental causal factors in the constitution of settlement patterns and the importance of ideological factors as for example the symbolic elements of the natural environment.

Territory and territoriality

I could have talked about territory during the proxemic section, but I decided to treat it separately for at least one reason: territory and its dynamic manifestation (territoriality), closely link with the internal structure of the social space, maintaining a causal quality with regard to settlement pattern and

³⁰ “The patterns of use of the soil and its sectors, distinguishable within archaeological levels, the interior-exterior game of an enclosure or a house built in the open air, the placement of structures, features and the conditioning of the space, they surely can orient us in our search for evidences of the resolution of the management of space. (...) Rocky forms, isolated trees, watercourses were and still are significance supports”. (translation is mine)

being some of the key intermediary motivations for the social practices and processes. The complex manifestation territory-territoriality is a capital issue for proxemic studies. In this context, territory relates to the distinct levels of space that “classic” proxemics identify in the human behavior.

In ethology, territory allows the propagation of a species throughout a regulated spatiality, offers a frame where things are done, coordinates the activities of the group and regulates the durability of the group cohesion. Territoriality keeps animals at adequate distances (*proper spacing*, in Hall’s words), it keeps individuals communicated and that assures the reciprocal assistance during the search for food and the defense against enemies. Territoriality is also essential for the reproduction of the species and the survival of individuals and groups. It also relates to status (Hall op. cit.: 8-9). Territoriality mainly defines through the spatiality and spacing mechanisms between members of the same species. The degree of the separation, the moment when territory defense begins depend on the degree of association to a given space and its components and to other individuals’ insistence to penetrate that space (Tringham op. cit.: 463). Following Odum, Jarman (1972) relates the ethological concept of territory to the positioning of an animal in a determined restricted area within it develops its activities and defensive attitudes. The theoretical current of human ecology considers that human society actually functions just like the animal world and this current is “guilty” for the intents to apply ethological concepts into social studies and to search for principles and regularities of the human spatial behaviors. In proxemic studies, territoriality is a concept used to designate the human tendency to mark, assume and defend spaces.

As Boschini shows, “territoriality refers to social organization, to the leadership, to the rights over a determined space” (op. cit.: 97)³¹. Territoriality reflects the limits of occupation, property/possession, and exploitation of a space by a community during a given period. According to the same author, some archaeological clues about the territory of an extended family could be the habitation sites, the resource exploiting sites, ceremonial spaces, funerary spaces, etc. Boschini even observes a fundamental aspect: the relationship between territoriality, proxemics and property relationships. Hall (op. cit.) insists on the same relationship when he defines the human territoriality as a manifestation of property, considering the private property as the territory of an individual and the communal property as the territory of a group; a fundamental idea for the understanding of this concept and its articulation within the frame of social processes.

Rowlands (op. cit.) recognizes territoriality as one of the main justifications for the defensive practices and he associates semantically the concept of territory with the concept of warfare, with the affective link to a space and the safety feeling of a group:

Emotional and historical ties may bind people to a particular region. Such a region may be regarded as a refuge (...) and form a minimal unit to which people may be reduced by aggression before active defense is adopted. An offensive response against infringement of territory is often characteristic of complex political systems possessing the capacity for its defense (idem: 448).

For Rowlands, the territory a society defends can be restricted to a small area around a settlement or it can include several settlements on regional scale. Territoriality is understood as a synthesis of minor spaces (structures, settlement) and as macro-spatial manifestation, on community levels.

In Tringham’s opinion, the biological concept of territoriality cannot be applied simply and directly to human societies, because the social processes associated to territory are far more complex than a simple amplification of an aggression-defense scheme. An idea I totally agree with. Tringham also links territory and defense. In a community’s space there are “several degrees of territoriality” related to distinct parts of the settlement: the hunting area, pasturing area, agricultural fields, households. These territorial units are delimited and defended in differential way, depending on the importance they have for involved people and the connection degree between man and that territory segment and also the degree of the exterior menace. The “territoriality degree” of each zone is not permanent nor constant, but irregular and temporal. Tringham’s territoriality degree is directly proportional with the importance of a space and the degree of external menace. Territoriality is a space-consciousness, as author says (idem: 464). Within a household, this consciousness can manifest on individual or higher socio-spatial levels: “At all levels

³¹ My translation from the Spanish original.

the human beings identify themselves as part of a social hierarchy within a particular space or territory, which may or may not be demarcated and defended, to a greater degree at certain levels than others” (ibidem).

The form and degree a space is delimited as territory depends on series of aspects related precisely to causal factors of the settlement patterns. The physical delimitations of a territory are cultural and can have some other functions related to other aspects of social ontology, as defense against animal and human intruders, property forms, even social exhibitionism (the ostentation of social status and richness). The archaeological reconstruction of territory limits use to be speculative, depending on the previous knowledge of various key aspects of the society and the preservation of the physical remains. The archaeological inferential potential of territory delimitations is conditioned by a series of limitative factors like natural environment, the availability of certain raw materials for construction, the development degree of labor forces, the type of economy.

Jarman (op. cit.) deals with human territoriality on community level and from the perspective of environment exploitation, independently of the theme of defense. Territory defines as *exploitation territory*, as the area around the settlement where resources reside; it is a space that constitutes on the relationship between site's position and the macro-spatial distribution of available resources. The exploitation of the territory depends on the distance between settlement and resource sites and the energy amount necessary to be inverted by the community. In some cases, culturally defined, this has to do with the minimum-effort principle. The author seems to adopt the principle of inverse proportionality between the productivity and the distance to resource areas, a scheme discussed by other authors too, like Chisholm (1968). Jarman's concept of territory has a lot in common with famous models resumed in Vita-Finzi and Higgs' *catchment area* (1970) and Clarke's *resource space* (1977). Jarman's conceptualization of a territory “typology” or territory “hierarchy” is actually based on Vita-Finzi and Higgs. He considers a *site exploitation territory*, defined as an area around a site usually exploited by a human group. The *annual territory* of a human group refers to the area usually exploited along a year. The annual territory could include one or more individual site territories which can be adjacent or separate and connected by corridors. Settlement territories use to be irregular and not circular (as they are often represented in ideal theoretical models made on maps and ignoring the physical actual aspect of the land). Technology could be an important conditioner for the extension of a territory; a higher technological level could allow a wider “catchment area”.

Clarke (1977: 21-27) develops a critical review of the various models applied to the relationship between settlement and its subsistence area, economical and geometrical models that often prove a theoretical reductionism separated from objective reality. The “subtheories” of von Thünen, Weber and Christaller try to quantify and simplify as geometrical representations (concentric areas, hexagons, polygons, etc.) the relationship between a settlement and its regional competence area taking into account several variables like energy costs, relation between productivity and distance to resources, technological level, and the presence of interchange and trade networks. Weber proposes the theory of the “optimum location of the site”, but he starts from schemes and realities typical for the nineteenth urban industrial world. The German geographer Christaller builds a model about the area served by a given settlement, the settlement's function in economic terms, and the network of surrounding settlements. In Christaller the territory appears as a definitory variable of a hierarchy of sites in the frame of a macro-spatial net and it builds on the criteria of optimum localization and lower cost.

The short review of distinct theoretical positions I made above was not pretended to be exhaustive, but rather a brief guide into the concepts of territory and territoriality, an analytical problem that stands as very important for the universe of social dynamics and the constitution of physical and social dimensions of space.

I have already mentioned the tied connection between territoriality and property relationships. I consider they are different forms or different and distinct intensity manifestations of a the same socio-spatial reality defined by the dialectic and socially significant relationship between man and his environment from the perspective of his active and concrete involvement into the internal dynamics of society in order to realize his social functions and satisfy the needs that justified the social processes. We could finally say that those two concepts are synonymous in certain way they share the same ontological area.

Territoriality, at least seen in evolutionary terms, is anterior to property within the social relationship system. Property relationships, with their forms and contents, are the institutionalized and socially regulated manifestation of territoriality (cf. Earle op. cit.: 43). Territoriality stands like the primary form of the interaction between man and environment. This interaction can be considered as dialectic, because the environment turns dependent on its own involvement into the social processes. It is not only a physical, geographical space, it is a space that exists as physical dimension of social space and in this hypostasis it cannot exist without its reciprocal, dynamic connection with humans. Man also cannot live without the diversity of elements that environment contains, indispensable for its existence as species and as society. Therefore, in the context of the social space, the relationship between man and environment is dialectic.

Saying that territoriality precedes property systems does not imply that the two exclude each other. On the contrary, the distinction between territory and property is conceptual, analytical and allows the two manifestations to coexist. In reality, this coexistence is necessary and a separation line between them is not easy to draw; doing it would cause a decapitation of a unitary aspect of social reality.

Reminding the primordial importance of property relationship for the settlement patterns, then we can set forth that if people cannot install their infrastructure wherever they want, then they cannot either declare as territory any extension of land and any component of the physical space; they have to obey previous stipulations about the place. In such a circumstance, territory can transform into a subjective manifestation or perception of the control over the environment with a subjacent objective reality represented by property relationships.

There can be serious contradictions between the territoriality defined by ideological aspects linked to the reproduction of the group identity and the territoriality defined by production social relationships. The subjective, ideologically built territory is much more flexible, irregular and unstable than the objective territory. It is worth asking ourselves if sometimes the property relationships themselves apply over a subjective territory previously established on a symbolic ratification of a space. Or if property relationships are used as juridical regulation of a physical space previously loaded by symbolic values.

In the animal reign, as well as in the human society, territoriality intimately associates with proxemic behavior. It is an unquestionable relationship and it would be superfluous to talk about it again. Nevertheless, if property relationships together with proxemic patterns impose causally over the constitution of settlement patterns, then territoriality shows up like subjective contiguous manifestation, as effect of the same processes and the same dynamics of factors that form the causal fundamentals of settlement patterns. I think that territoriality could not be considered among the causal factors because it is posterior to the configuration of the physical dimension of social space. The concept of territory can be applied to the distinct levels of the social integration scale of my model based on production mode: individual, producer, productive agent, social groups, determined social groups, society. It would settle somewhere on the fusion point between these social levels and the corresponding space levels.

Actually, I believe that territory, from the perspective of my model, is the very physical extension of an analytical space level corresponding to a determined integrative social level. The territory is the horizontal extension on the plan of the physical dimension of a spatial level, necessary so that the corresponding social level can accomplish its functions within the dialectics of the social space and assure its own reproduction.

Territoriality is the dynamic manifestation of territory, its processual, phenomenical expression that incorporates the synthesis of actions, relationships and processes that occur around the exploitation and conservation of territory. The territory, as subjective expression of the physical extension of the social space, is not static, but in continuous transformation, as effect of the constant changes of social space. As subjective expression of objective realities regulated by other factors anchored in the social dynamics, territoriality manifests more clearly in the course of practices associated to reproduction, defense and conservation of social groups, communities and states. It is related to ideological managements from the superstructure and belongs to group identity as main reference. For an integrative social level (individual, producer, productive agent, social group, etc.), the physical extension of the corresponding space level assumes an hypostasis of territory when it feels the necessity to delimit spaces and defend or conserve the physical dimension of space and consequently assure the maintenance of the proper functioning of its social dimension.

Before the end of this article, I want to point briefly on the concept of internal dialectic of space in order to name the *intrinsic quality* of social space. Along this theoretical proposal I have repeatedly emphasized the internally dynamic and complex nature of social space, as the synthesis of a variety of reciprocal interactions between distinct social levels situated on a hierarchical scale, on one side, and analytical levels of space, on the other side, generating a structured and organically integrated whole of components defined according to the dynamics centered on productive processes. The settlement pattern was focused from the same perspective; its causal factors interconnect each other representing the physical expression of the complexity of processes manifested within the social dynamics.

In the materialistic vision, the dialectic is the ontological fundament of the social dynamics. Consequently, social space also characterizes by an internal dialectic. This dialectic also leads the "behavior" of distinct causal factors and is the necessary correspondencce for a complete manifestation of the social dialectic.

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