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The Deep Structure of Architecture: Constructivity and Human Evolution

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> The history of the human settlement has not been written yet—archaeological finds of the stone age period remained too fragmented until now, and, for too short a time only, settlement or landscape archaeology play an established role in research.
>
> —Jens Lüning, 1989

THE CONCEPT OF ARCHITECTURAL ANTHROPOLOGY

Architectural anthropology is a relatively new type of architectural research. Based on the Yerkes and Yerkes (1929) concept of "Evolution of Constructivity," it defines *architecture* as all that hominoids and hominids built and build. In many former studies, we have tried to outline this approach from various viewpoints.[1] All these studies remained relatively limited on clearly defined subjects, using essentially instruments of architectural description and theory, and as such, they can be considered as contributions to the wider field of anthropology.

However, anthropology is not only a container, which can integrate new things. It is also an immense field of data that has a long and highly complex history of research. And most important, it has developed a systematic scientific structure (see, e.g., W. E. Mühlmann's excellent *His-*

tory of Anthropology [1968]). It is in this deeper scientific sense that, from the beginnings, the term *architectural anthropology* was conceived. Architecture, defined anthropologically in the widest sense, is considered as a fundamental part of human culture and consequently has to be researched in this widest framework.

The following shows the essential characteristics of this dialogue. What does the concept of architectural anthropology contribute to cultural and physical anthropology? We will see that, on one hand, the term *anthropology* confronts us with a very challenging framework of existing research and results; on the other hand, the architectural view has something important to contribute.

Superseding Conventional Anthropology with the Anthropological Implications of Material Culture

Architectural Archaeology

In a recent paper on architectural archaeology we have discussed the present state of research essentially reviewing the book *La maison des origines* (Lepoittevin 1996). Most important, we found indicators to consider the prehistory of architecture with similar time depths as those of the earliest tools, that is, about 2 million years ago. On the other hand, we dealt critically with the archaeological method. Its strict clinging to the methods of history, its fixation on durable and datable remains, and its often very fragmented finds are not suitable for the reconstruction of the highly complex prehistory of "architecture" and "settlement." In addition, if—following the Yerkes concept of a primarily fibrous evolution of constructivity (Yerkes and Yerkes 1929; Egenter 1983, 1990b, 1998*)[2]—we can assume that early remains were dominantly not of a durable character (prelithic) fibro-constructive industries.[3] Thus archaeology reveals itself as a highly questionable instrument. We have to look for other methods.

Toward an Anthropological Concept of Material Culture

Material culture is the basic term that supports archaeology and prehistory. Can we define it differently? Can we enlarge the narrow definition used in archaeology (durable remains) into a wider, anthropological concept, which uses the term *material culture* in an ethnoprehistorical framework (Wernhardt 1981), including material (proto) culture in primatology?

In their textbook on anthropology, Ember and Ember (1994) present a list combining fossil records and major cultural developments according to first appearance. Their summarized presentation of most important "cultural developments" provides an overall view of present conceptions of human evolution, biological and cultural. The list schematically uses five phases that are described in the framework of conventional physical and cultural anthropology. They are:

1. Late Cretaceous to Miocene (we will only use the Miocene)
2. Pliocene/Lower Paleolithic
3. Middle and Upper Paleolithic
4. Mesolithic and Neolithic
5. Bronze Age.

The above numbers and periods are used as a basic reference in the following list of dated fossil records and prehistorical sources that can be superseded by a new anthropological grid (Figure 3.1); the grid contains hypothetical sources reconstructed ethnoprehistorically and primatologically in the framework of architectural anthropology. From *left* to *right*:

- Spatial organization of settlement[4]
- Nest-building behavior
- Semantic architecture
- Domestic architecture (derived from semantic architecture)
- Controlled fire (derived from semantic architecture)

These new sources are called "hypothetical" because, consisting of nondurable materials, they cannot be documented archaeologically unless they appear in combination with durable elements (stones, bones, etc.; Egenter 1994c, 1998*). But there are other ways to test the concepts of "constructivity" and "fibro-constructive industries" on their paleoanthropological and prehistorical value. The question is: If we assume that fibro-constructive industries had been widespread in prehistory, can we show any impacts, either in the fossil record or with prehistorical sources?

For this discussion Figure 3.2 was prepared. It shows the same numbered phaseology of Ember and Ember (1994: 49, 63, 84, 124, 126) with numbers 1–5 at the top. But the corresponding fields are turned by 90 degrees, and the formerly vertical arrows are now shown horizontally.

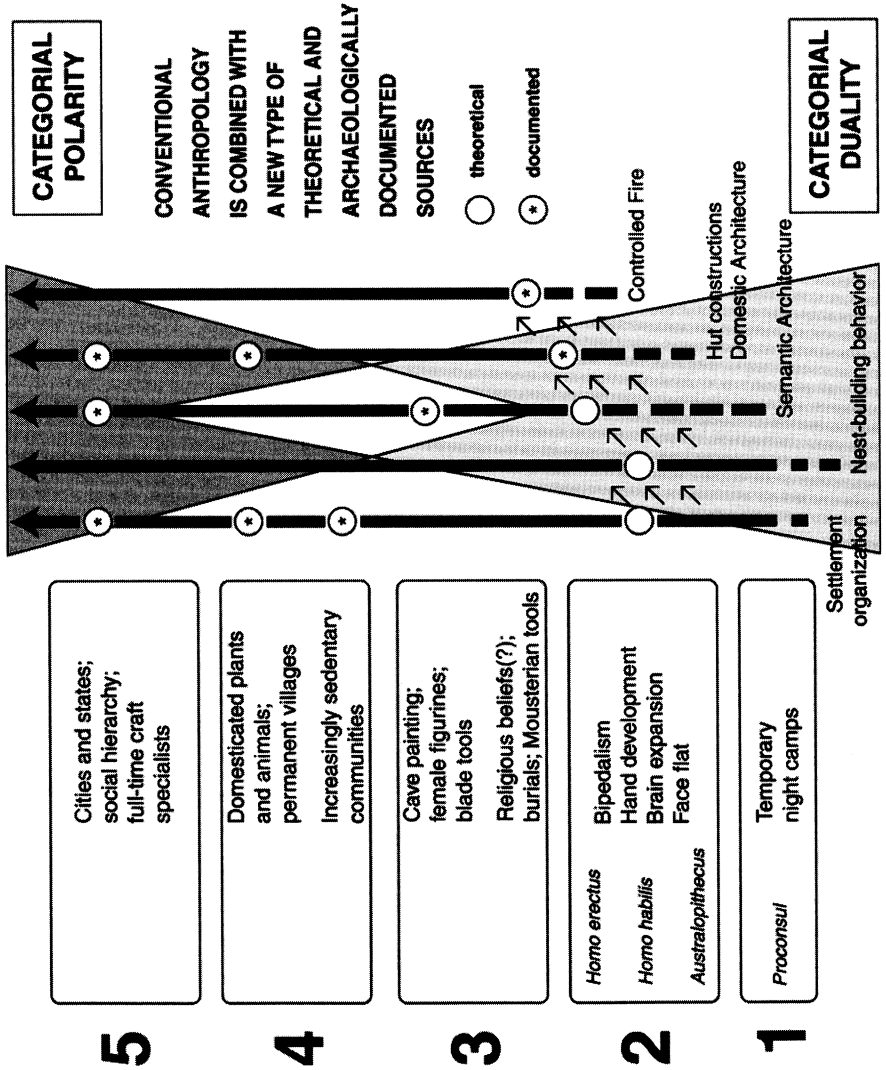
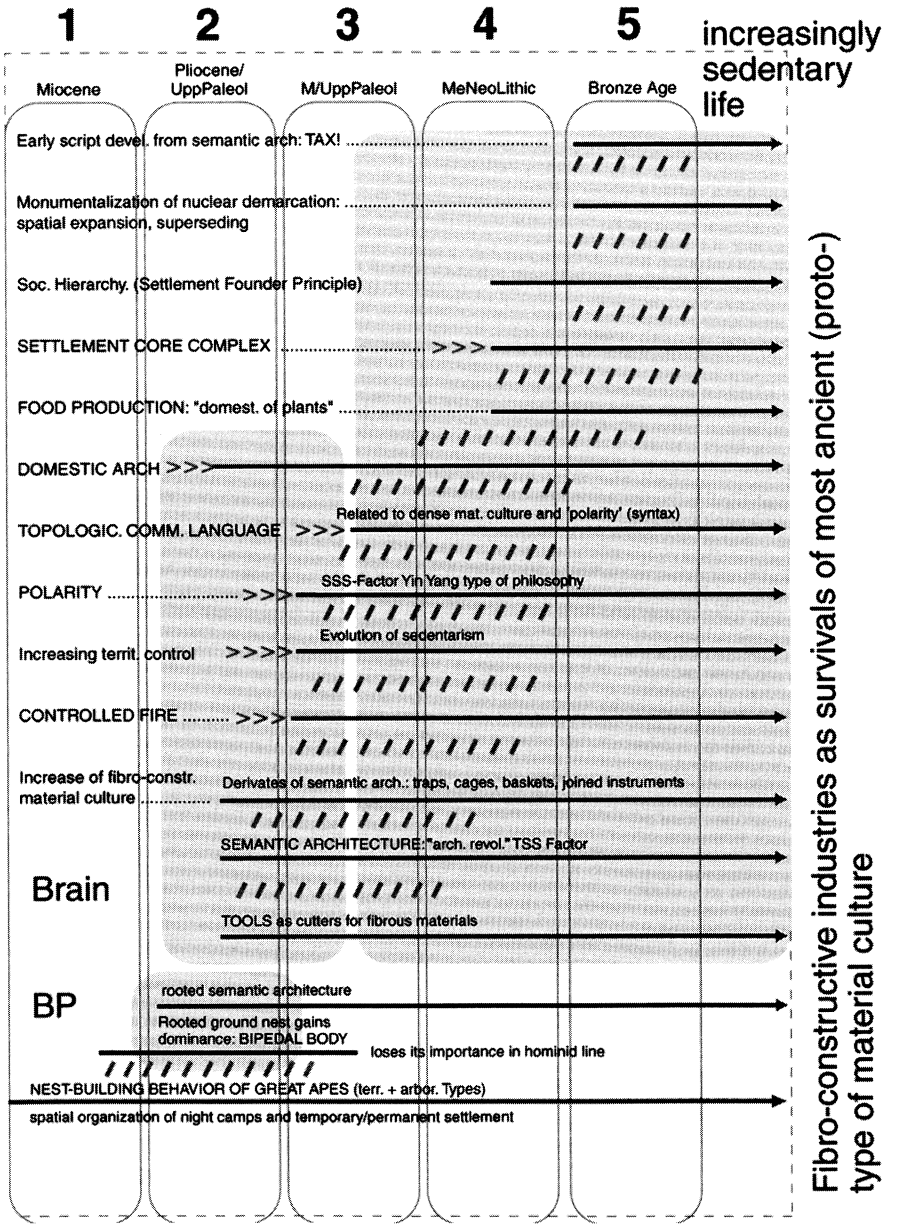


Figure 3.1. New anthropological grid. Author's eleboration on Ember and Ember (1994: 49, 63, 84, 124, 146), list of fossil records and cultural developments.

Figure 3.2. Evolution of constructivity and its impact. Interpretation by the author of the five fields of the Ember and Ember (1994) grid.



Key: Comm = Communications; TSS = Temitorio-Socio-Semantic; SSS = Spatio-Structuro-Symbolic

In addition, other criteria are added as arrows, for example, "structuro-symbolic factor" implying "polarity," or Yin-Yang type of cognition (Egenter 1979, 1980, 1982, 1994a, 1994b, 1994c, 1995). It is evident that this scheme stimulates new discussions in anthropology and prehistory (Egenter 1986, 1998*). The interactive zones are shown in three rounded rectangles. They indicate three anthropologically important subjects: (1) vertical position of the body, (2) increasing brain size, and (3) increasing territorial control and sedentarization. We will discuss these topics under the following three main titles.

THE ERECTION OF THE BODY: NEST BUILDING

Routine Ground Nest Building of the Great Apes

In a study by the author entitled "Ape Architects" (Egenter 1983, 1990b, 1998*), the distinction between arboreal nests and ground nests was emphasized. In present theories of hominization the ecological distinction of arboreal and terrestrial domains of locomotion is crucial. Both types of space form a climatically conditioned transitional environment with specific implications for locomotion, food control, and social behavior. Most anthropologists today agree that this transitional environmental background provided the stage for hominization processes in Africa. However, the function of the components in this environment is controversial (Sabater Pi, Veà, and Serrallonga 1997). Sociobiology is fixed on the toolmaker concept. Authors are not aware of the empirical implications of nest-building behavior, and consequently its potential as a prototype of "material culture" is neglected (McGrew 1992). Sociobiological primate research thus deprives itself of an important element of the subhuman condition: *constructivity* and the routine demarcation of existential place and space (Egenter 1983, 1998*).

On the other hand, if nest-building behavior is considered from the Yerkesian point of view as a constructive alteration of the natural environment for an important existential function, nightly rest and sleep, with the potential of adaptation to evolving processes, then the ground nest becomes a phenomenon of outstanding importance (Egenter 1983, 1998*). First, from a constructive point of view the arboreal nest is part of the tree in which it is built. It gains its stability naturally from the tree. In contrast to this, the ground nest introduces entirely new parameters that are evident if we look at it as a construction. Rooted materials are used, for example, bamboo stalks in a bamboo grove. Now

vertical stability is fully a result of the technological activity of the animal. Stalks are broken, bent toward the center, interwoven, and knotted. A hutlike construction results, which, however, is used as a "tower" to sit or lie on (for illustrations, see Egenter 1983, 1998*). A further important point: If we assume that, like among present great apes, nests are built routinely for each day's night, it gains an enormous quantitative importance. Sociobiologists are not aware of these quantitative dimensions, very likely due to the nest's perishable character. Note that if the life production of one subhuman nest builder is vertically heaped up, a tower of about 11 times the height of the Eiffel Tower in Paris results. To be aware of this quantitative aspect is of utmost importance (Egenter 1983, 1998*).

The Ground Nest and Vertical Position of Body

Zoologically speaking, bipedalism and erect locomotion are not uniquely human. But, evidently, very important changes of existential conditions are related to such biological transformations. However, present theories regarding the evolution of hominoid and hominid bipedalism provide rather superficial interpretations of firsthand impressions. In contrast to this, the argument based on nest building is cogent. It relates not only to the erection of the body but includes the whole complex of arm and hand development (increased rotation, precision grip) and increased importance of stereoscopic vision (flattening and verticalization of face, vision focused on operations with hands). If we assume that open savanna became dominant in certain regions, the capacity to efficiently build a stable ground nest of a certain height in vertical body position might have become an important selective advantage, essentially by the spatial and social protection it offered (Egenter 1983, 1998*).

In short, we can maintain with solid arguments that routine ground nest building must have been the main factor in the erection of the body and bipedal locomotion among Miocene hominoids living in or at edges of open woodlands and grasslands. This evolutionary process of terrestrial locomotion with erect body posture was more or less completed with bipedal hominids that lived in East Africa about 4 million years ago (*Australopithecus*). It was maintained and refined as a basic characteristic in the following hominid evolution including *Homo habilis, H. erectus, H. sapiens*, and *H. sapiens sapiens*, that is, modern humans. To conclude, we might ask a fairly provoking question: Is the upright body posture of humans, in fact, a reminiscence of a very primordial "history"

of architecture, the dominant development of ground nests in open savanna landscapes? (See Figure 3.3).

THE INCREASE OF BRAIN SIZE

The Complexity of the Pongid Nest: Prerequisite for an Architectural Revolution

Protocultural Characteristics of the Nest

Let us shortly come back to the suggestion of Yerkes and Yerkes (1929) of an evolution of "constructivity" related initially to nest-building behavior of the great apes. It is very important here to stress the complexity of the apes' nest. It is deeply interwoven with pongid life.

- It supports an existential need that covers half of the animal's life, the nights. Pongids are nomads. Each animal produces one nest every night of its approximately 40 years of life. In contrast to the daytime spent mainly with locomotor activities and nutrition, the large-sized animals need rest and sleep in horizontal body position (Egenter 1983, 1998*).
- Nest building is of a high complexity in its material, constructive, social, spatial, topo-semantic,[5] and formal conditions (Egenter 1983, 1998*).
- It is partially instinctive behavior, partly learned behavior (Bernstein 1962, 1969; Lethmate 1977).
- In an evolutionary sense, the distinction of tree nests and ground nests is of primary importance. Nest types correspond to two different environments (arboreal, terrestrial) and thus might have played an important role in hominization.

Thus, nest-building behavior shows much more protocultural characteristics than nut-cracking or ant-fishing in the toolmaker concept. In this context, McGrew's (1992) book with its bold title *Chimpanzee Material Culture. Implications for Human Evolution* is extremely misleading. It is based on the very marginal phenomenon of tool use; nest building is completely neglected.

The Psychology of the Nest

The nest-building behavior provides arguments to even speak of the "psychology of the nest."

- *Learning*. Constructive behavior is partly learned (Bernstein 1962, 1969; Lethmate 1977). This implies psychological components. For example, babies were

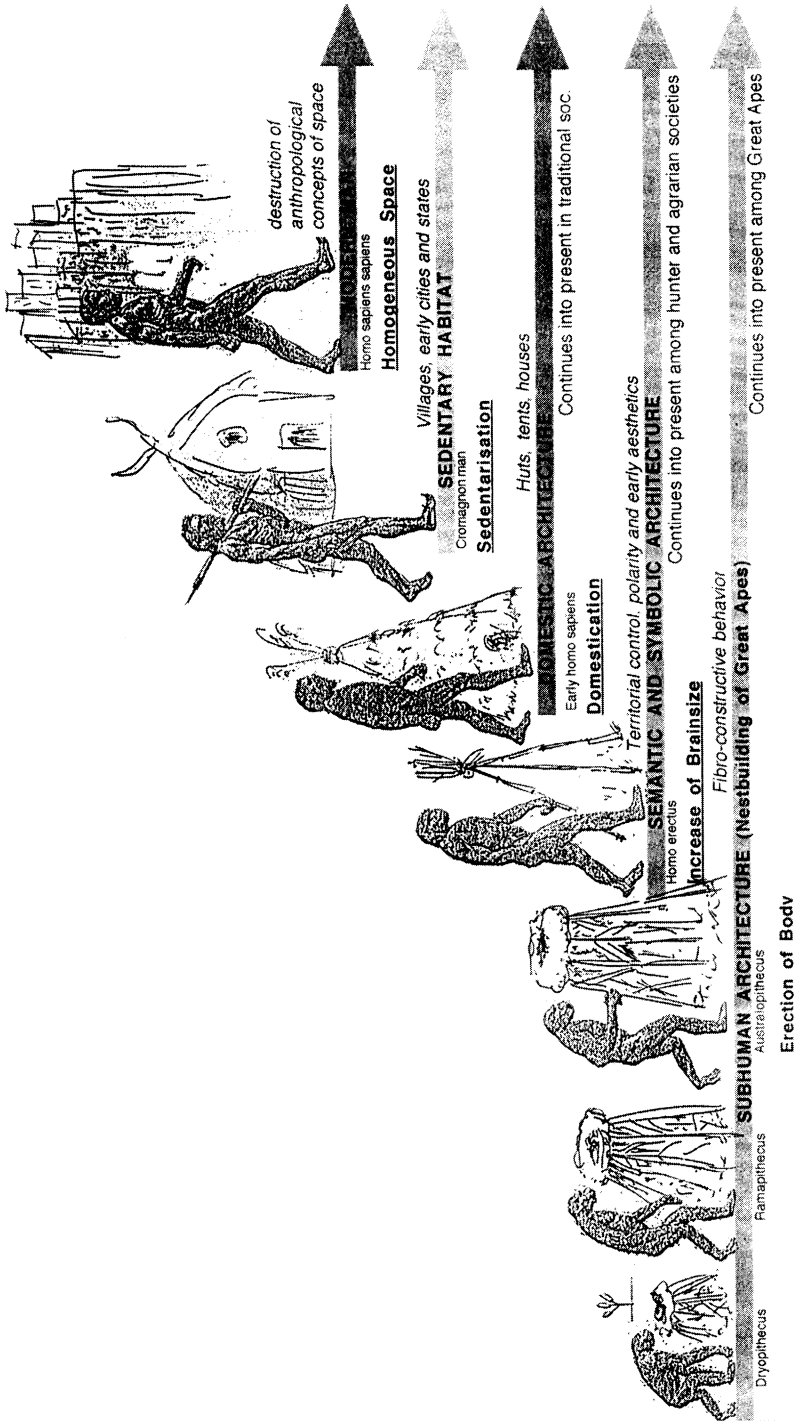


Figure 3.3. The evolution of man, habitat, and architecture. Interpretation by the author showing bipedal locomotion and upright body posture in relation to the evolution of architecture.

observed playing "to construct nests." The relation of mother and child also reflects in the form of the nest (Egenter 1983, 1998*).

- *Judgment.* The selection of site and material implies selective capacities (Egenter 1983, 1998*). Stability resulting from construction is crucial for the nest's function as a protecting platform for the night.
- *Form perception.* Formal aspects are involved. Evidently the animal is sensitive to the constructive outcome (stability, comfort; Egenter 1983, 1998*). Aesthetic qualities are absent.
- *Individual identity.* The nest is always used by the individual that makes it. Struggles are reported (VanLawick-Goodall 1971).
- *Territorio-semantic aspect.* The group expresses its social relations in space (Kawai and Mizuhara 1959). The nests of a night camp are a system of efficient spatial control (see Figure 3.5).

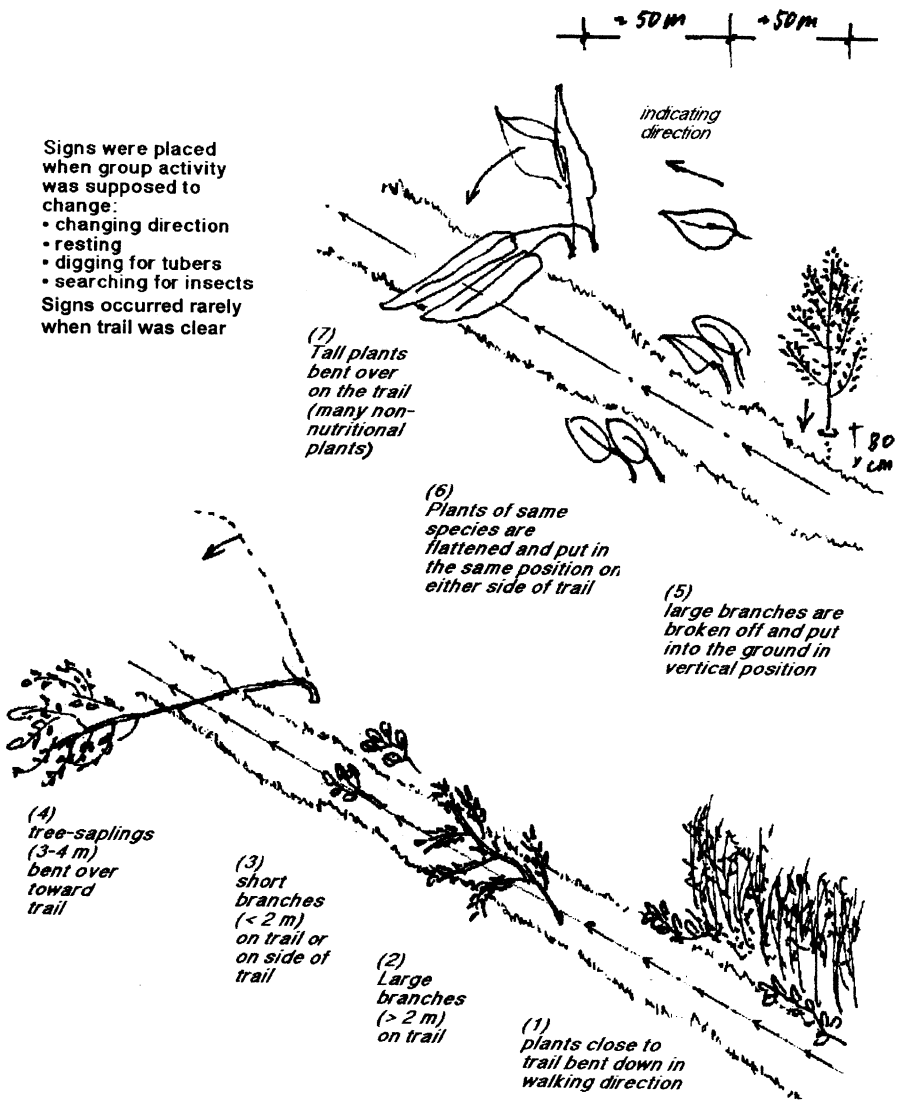
These psychological aspects show clearly that the nest is intrinsically interwoven with the existence of the great apes. A definite artifact is created that suggests a high degree of identification of its maker with the produced object and its complex functions.

The Topo-Semantic Characteristics of the Pongid Nest

Finally, we should also ask for semantic criteria. To what extent are the nests part of the pongid orientation system? Are used nests perceived as signs in their landscapes? Can they be distinguished from those of other groups? While it seems there are no reports on semantic aspects of nest-building behavior, Savage-Rumbaugh et al. (1996) recently reported on their observations of a group displaying a fairly elaborate system of traffic signs (Figure 3.4). A large group split into two parts. The first subgroup used at least seven different methods to inform the second subgroup about the way they had taken. Leaves of different size, twigs, branches, and small trees were used. Signs were bent or torn and laid on or beside or across the path, indicating direction. Most interesting in our context, large branches were broken off and stuck into the ground in upright position! Evidently the animals were using their strength. Branches were stuck about 80 centimeters into the ground. Thus, the Bonobo sign system confronts us with an extremely important fact that there is an artificial semantic dimension in primate behavior with the purpose of information and communication. The transmitted code is independent of physical or vocal contact; it is "read" from the conditions of an artifact and its position in the environment.

This "topo-semantic" element is also present in nests arranged by a

Figure 3.4. "Traffic signs" made among the Bonobo subgroups while on daily migration. Drawings based on Savage-Rumbaugh et al. (1996: 173–95).



gorilla group in temporary night camps. Kawai and Mizuhara (1959) have measured such a night camp and have published plans of it. The arrangement of the nests shows a clear order (Figure 3.5). Their disposition expresses spatial values (center, periphery). The nests are clearly organized in view of environmental control (Egenter 1983, 1998*). Thus the topo-semantic concept is not only valid in the domain of "migration" (Bonobo) but also in the framework of "dwelling" (night camp), eventually also in regard to food control.

So far these are all primatological data. But, as the hypothesis of Yerkes and Yerkes indicates, fairly constant behavior patterns are assumed in the framework of sociobiology. We can thus assume that the Miocene apes about 15 million years ago had a fairly complex landscape of built form. In niches of open woodlands (formed due to climatic changes between 16–11 million years ago), it consisted of the night camp type dominantly consisting of ground nests described by Kawai and Mizuhara (1959). What is extremely important here is to be aware of the high complexity of this constructive topo-semantic behavior as a prerequisite for the following: It can be taken as a basic precondition for the hominization of the brain.

Paleoanthropology: The Problem of the Human Brain

Slightly simplified, the fossil records tell us the following in regard to the increase of brain size. *Australopithecus* shows no difference to living pongids (500 cc [cubic centimeters]). Among *Homo habilis*, we find about 750 cc, *Homo erectus* shows about 1,000 cc, and *Homo sapiens* appears with a brain size of approximately 1,500 cc. The overall increase is about 300%. What provoked this tremendous need for an increased memorizing capacity? In the framework of anthropology this question is still widely open. Was it "language," "toolmaking," "social interactions," "outwitting rivals to get mates"? All these potential impacts are discussed and taken individually or more or less collectively as the main cause(s) of early hominid brain developments. In contrast to this questionable guesswork, architectural anthropology proposes a *hidden architectural revolution* as the *prime mover* for the development of the hominid brain. The process was triggered by the early use of stone tools. This shall be outlined in the following.

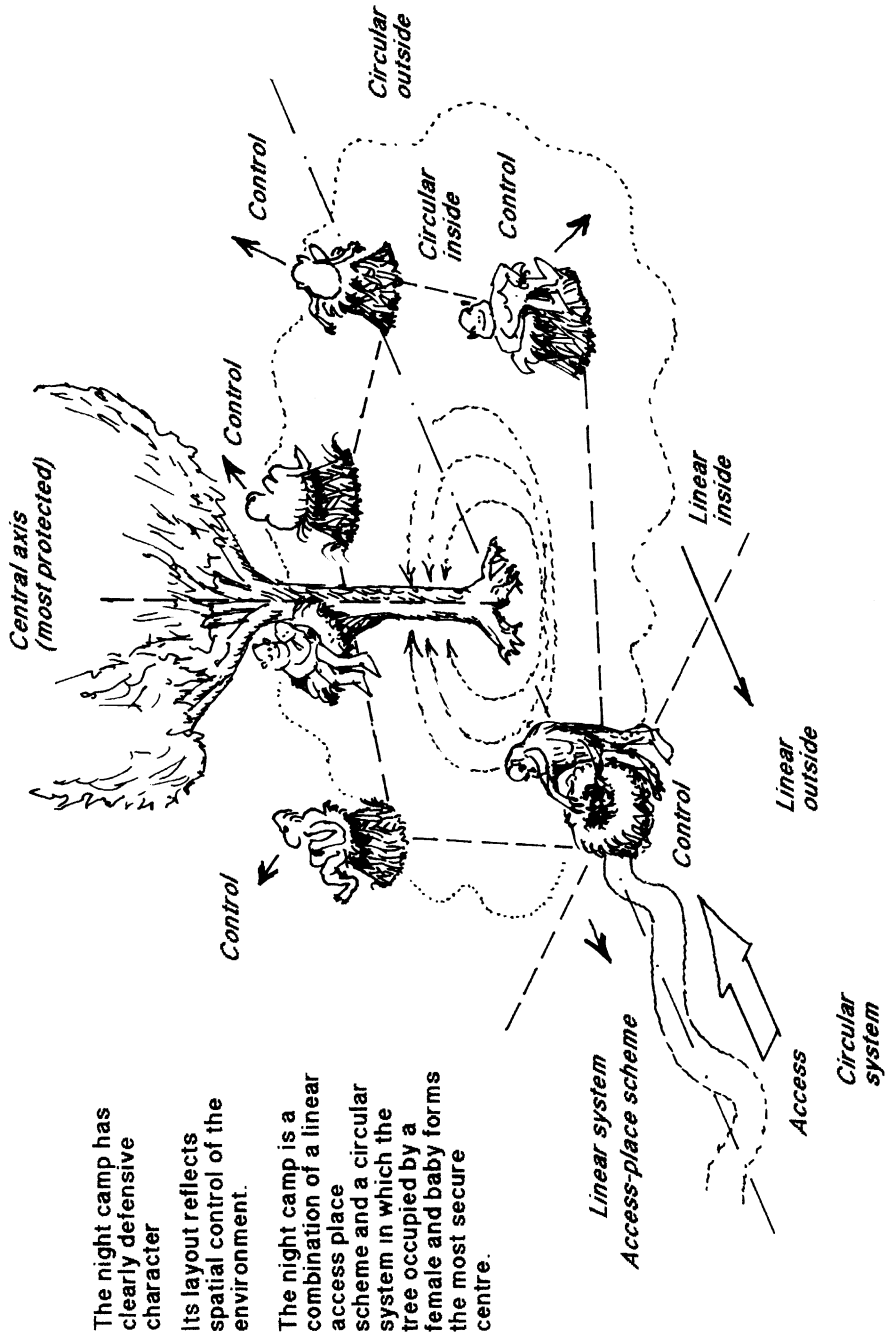


Figure 3.5. Gorilla night camp configuration. Spatial interpretation by author of gorilla night camp after Kawai and Mizuhara (1959: 16).

The Toolmaker Concept Is Overrated Today

Many anthropologists strongly favor tool use as the "prime mover." However, on a closer look it is evident that the conventional toolmaker concept is much overvalued today. First, toolmaking and tool use are very marginal among present-day pongids, even absent among orangutan (McGrew 1992). In addition, its complexity is extremely low. And third, tool activities like nut-cracking and ant-fishing are only a small part of an existential category, namely, nutrition. McGrew's attempt to describe tool behavior of the great apes as a prototype of "material culture" is not at all convincing. Evidently, it is a scientific construct influenced by the durable finds of conventional prehistory.

The Tool and Increasing Brain Size

Australopithecus had no tools, and for *Homo habilis*, the earliest types of tools are assumed. *Homo habilis*, the first remarkable indicator of an increased brain size, lived more or less in the temporal period where the earliest stone tools are assumed (around 2.2 million years ago). This approximate temporal coincidence is seen as a very strong argument for the "man the toolmaker" concept. The early tools are generally attributed to hunting and/or scavenging. However, it is very difficult to imagine how a relatively simple and stereotyped manipulation, like making stone tools and using them for cutting meat and scraping skins, might have been able to influence brain size and memorizing capacity.

The First Architectural Revolution

The Impacts of Fibro-Cutting Tools

Only a few authors involved in this discussion focused on toolmaking and brain development are aware of the variable factor immanent in the term *tool*. How was it used? Lawrence H. Keeley (1980) showed that stone tools were not used exclusively in the framework of hunting activities but also for cutting fibrous materials, plant stems, and wood. This is very important information. But what did this mean? Of what nature were the fibrous materials that were cut with early stone tools? To gain an idea of the considerable dimensions of these questions, let us return shortly to the discussion of the ecological circumstances of hominization.

If we have a look at our Figure 3.2, we see that the arrow representing "nest-building behavior of great apes" continues into the present. Evidently it owes this continuity to the uninterrupted presence of a mixed

arboreal and terrestrial environment. Relatively original conditions were preserved. Brain size remained constant and has not increased among the great apes. If, however, in some regions climatic changes favored the formation of open savannas, it can be assumed that the ground nest became dominant in and around open landscapes. As we have mentioned above, it can also be inferred that the unique social grouping of terrestrial night camps provided protection against predators. The ground nest offered a selective advantage, but it had a great limitation (and this is very important in view of its implications as a prototype of material culture): With some observed exceptions of heaped grass nests ("siesta nests"), ground nests of the pongids are exclusively constructed with rooted materials. The topo-semantic system was limited on the conditions of identity of biotope and technotope. That is, each nest had to be constructed where suitable plants grew.

From Rooted to Artificially Stabilized Architecture

In this environmental scenario of a widely diffused and complex terrestrial nest-building behavior, the appearance of the first tools must have provoked the first architectural revolution. Using stone tools for cutting fibrous materials allowed an important evolutionary step away from rooted construction.

- It provided independent choices of (a) nesting/resting/camping sites and (b) sites where construction materials were taken.
- The tool allowed the divergence of biotope and technotope.
- What we called "judgment" above, a capacity for topological evaluation in the framework of nest-building behavior might have evolved considerably under this new condition.

In addition, the appearance of tools might have produced further dynamic processes of building.

- *Mixed materials.* Different materials could be mixed into the same construction.
- *New techniques.* Binding, bundling, weaving, and the like, were probably very quickly developed.
- *Staking.* Rooted stability had to be replaced by artificial stability.
- *Structural differentiations.* Particularly staking and other types of stabilization led to structural differentiations with heaping, binding, covering techniques.
- *Functional differentiations.* Rooted, layered, or staked constructions were functionally differentiated. They were used as signs for food control, food conser-

vation, traps, cages, storage, and so on. Early hunting outfits like spears and arrows very likely were derived from staking.

- *Development of stone tools.* Increasing differentiation and refinement of building processes must have greatly stimulated the development of stone tools. Refinement of tools allowed increase in constructive precision.
- The use of sharp stone blades combined with handles to form axes provided construction materials offering increasing stability and durability.

An Open System of Fibro-Constructive Potentials and the Demand for Memorizing Capacity

We have theoretically outlined an open system of fibro-constructive potentials that allows a wide range of developments also in regard to its social, spatial, psychological, and particularly also topo-semantic aspects (communication). If we assume that this high complexity increasingly gained importance with the first architectural revolution, we can imagine the demand for increased memorizing capacity. Places were marked for settlement, for migration, maybe increasingly also for food control. It required a new capacity: to memorize these places, the markers, their structure and form and their surroundings, what they signaled and so on. Very likely those who in this increasingly complex situation were disposed to larger memorizing capacities had greater selective advantages. Evidently these parameters allow us to reconstruct theoretically a wide range of early outfit with material culture. But what does such a fibrous culture really look like? What are its forms, its functions? Prehistory naturally has only very fragmentary sources, but in the framework of the anthropological definition of material culture, the hypothesis can be tested in the domain of ethnology.

Semantic architecture

Fibro-Constructive Industries and the Ethnological Concept of Material Culture

Fibrous and fibro-constructive industries are a common and very important factor in the material culture of traditional societies (Hirschberg and Janata [1966] 1989). Functionally they cover wide ranges of traditional societies' needs, including dwelling (Oliver 1997), food control and clothing. But, owing to their materially perishable nature, fibro-constructive industries have not been not considered of any value in

regard to high antiquity. They have not been attributed "historical" value, like stones and bones, in spite of their evidently "primitive" characteristics. Binding with fibrous materials is without doubt a very ancient method of fixation. Similarly, weaving as a method to produce flat or curved surfaces, is a technique of high antiquity, already observed in the animal world. Note further that often the hand is exclusively used as some sort of primary, or most primitive, tool. In addition, since the fibrous materials used are directly taken from the environment, a great autonomy is guaranteed, a further characteristic speaking in favor of great antiquity. These three points sufficiently legitimate the interest in the "historic" value of fibro-constructive industries and we can ask questions like the following. Can the ethnographical domain be used to gain insights into the prehistorical conditions of fibrous material culture? Can we gain indicators of corresponding parameters as listed above and, eventually, can we reconstruct principles of their development?

The Ethnological Model of the Paleosiberian Ainu

There is probably no better example to answer these questions than the material culture of the Ainu as reported in detail and with very precise technical drawings by Kayano (1978). His important book lists about 250 tools and instruments an archaeologist would never find in any site of Ainu archaeology. Most of the objects are exclusively made with fibrous materials and wooden sticks. The Ainu were gatherers and hunters with a strong paleosiberian component. A great part of their material culture can give us fibro-constructive ideas about prehistorical conditions. Very simply constructed traps and nets for small animals, cages to keep them, fish traps and nets, baskets and bags for transportation, very crudely made boats, various instruments, weapons, tools for various purposes, even games for children, and status symbols or objects for the decoration or protection of the human body can be found. Small temporary huts were used while hunting. Such an equipment of objects of material culture was doubtless possible to make in the Mesolithic period (see next paragraph) but very likely already during the Upper and Middle Paleolithic. Consequently, material culture must have been much richer than archaeologists make us believe. The ergological and technological characteristics of this broad range of Ainu objects show very clearly that these things were not "invented" recently. Most of them were conceived not functionally but with polar principles.

The Topo-Semantic System of the Ainu

But there is something even more surprising in our ethno-prehistorical analogy. The Ainu have an extremely interesting topo-semantic sign system, called *inau* (Fig. 3.6). Ethnographers were not aware of its existence, because they interpreted the concerned behavior in terms of "primitive" religion (Batchelor 1971). It came to light when its territorial implications were discovered. Kremp (1928) was the first to present a systematic study, showing that the Ainu sign system was dominantly related to settlement, to the house and its hearth, and that it also extended into the control of food and other resources. The elaborately decorated staked altar behind the Ainu house clearly classifies outer domains and their "income" according to hunting, fishing, plant collecting, and small-scale gardening (Egenter 1991b, 1994b, 1998*). Note that all huts and houses were arranged parallel to the river, which functioned as an orientation system in this local "cosmos." Watanabe (1973) confirmed this system from the ecological viewpoint. Ohnuki-Tierney's studies (1969, 1972, 1973) contributed much to the understanding of such systems of spatial organization, but unfortunately, she interprets the Ainu microcosm macrocosmologically.

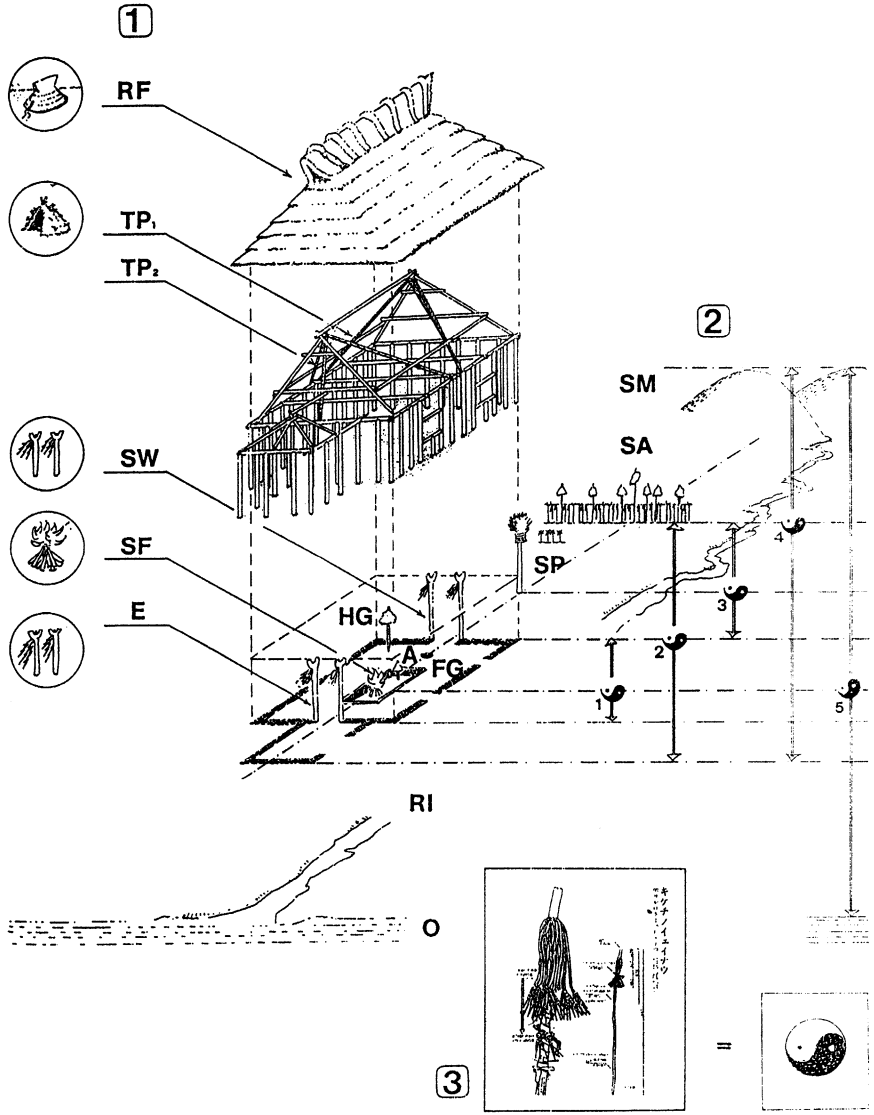
An Agrarian Society: The Japanese Case

Surprisingly, in view of the parameters outlined above, very similar conditions can be found on the level of an agrarian society, namely, Japan. Due to its particular culturogeographical location as an island archipelago relatively isolated from continental dynamics, its villages have preserved very ancient rural traditions.

In his two-volume book on the Japanese cultural history of straw (*Wara*) Kiyoshi Miyazaki (1985) has gathered materials from agrarian villages all over Japan. This "straw culture" was still vital into the early times after the Second World War, or until Japan was massively industrialized in the modern sense. It covered a large part of material culture, from clothing, means of transportation, sacred objects, and so on, and very clearly had the traits of a material culture based on traditional local autonomy (Figure. 3.7). This fibrous culture doubtless has its roots not only in the Kofun and Yayoi periods; it was imported with the early settlers as a vital tradition, and the autonomy it provided helped them to implant themselves in the new domains.

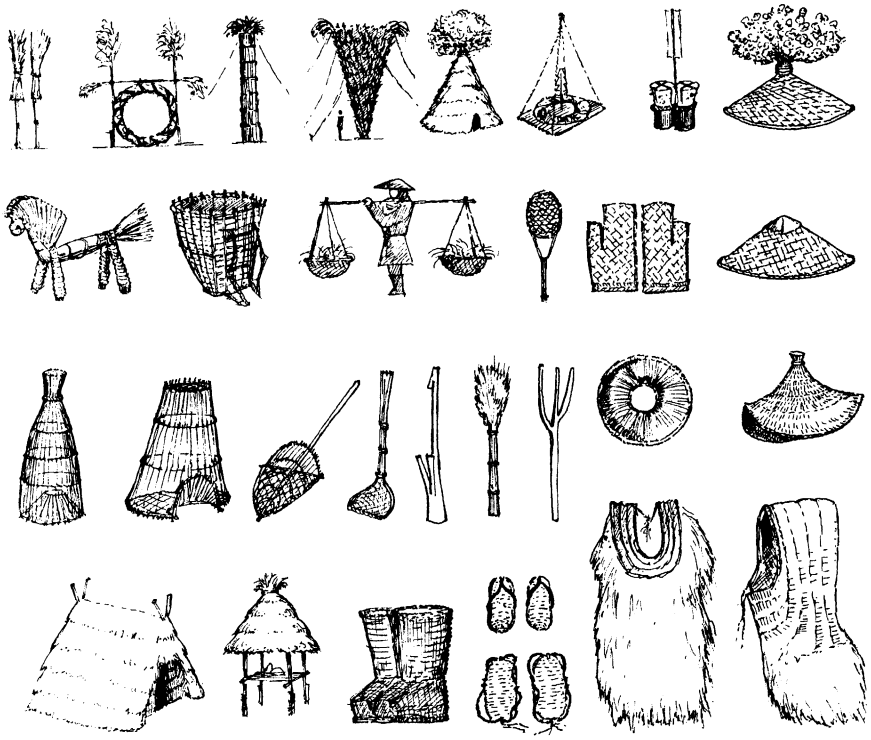
A very striking aspect of this fibrous culture of agrarian Japan is the following: In the framework of its popular village Shinto, but also in its

Figure 3.6. Elements of Ainu house and the schematic landscape.



Key: RF = Roof; TP_1, TP_2 = Structural Tripod similar to hunting hut; SM = Sacred Mountain; SA = Sacred Altar; SP = Sacred Place; SW = Sacred Window; SF = Sacred Fire; E = Entry; A = Altar; FG = Fire Goddess; RI = River; O = Ocean; 1, 2, 3, 4, 5 = Five domains in the Ainu worldview characterized by complementary structure, thence Yin-Yang symbol; [1] = Domestic domain; [2] Natural domain; [3] Inau sign.

Figure 3.7. Fibro-constructive material culture of agrarian Japan.



urban historic Shinto system, Japan has preserved a fibro-constructive topo-semantic system with a very surprising density (Egenter 1979, 1980, 1982, 1994a, 1994c, 1998*; Figure 3.8). In spite of its technologically elementary characteristics, this topo-semantic system appears paired with high ontological sacred values. Topo-semantic signs are considered as deities and appear integrated into historical Shinto religion. In the framework of architectural anthropology, these cults reveal themselves as cyclically renewed archives of local history. The signs document essential points of the settlement. Their cyclic renewal supports the political and social structure of the local settlement. The whole local "constitution" is registered in terms of cult behavior.

Toward a Universal Concept of Semantic Architecture

In cases like Japan, we become aware that such artificial topo-semantic demarcations must have been a general and essential part of the prehis-

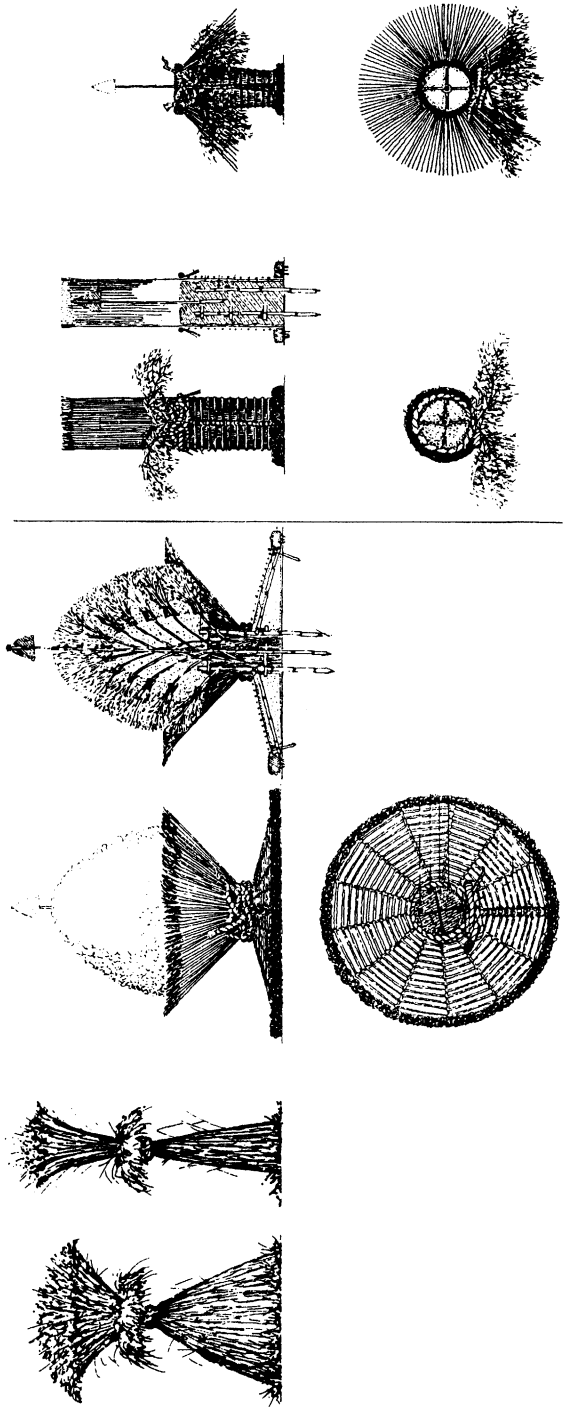


Figure 3.8. Semantic architecture in Japan: Rooted forms; hut-like type; and column type, related to male gender symbolism (left) and female (right). The two primary forms, hut-like and column type, allude to primary rooted forms. *Source:* Egenter 1982: 11, 18, 17.

torical settlement. We find them as maypoles and the like widely in European folklore studies (Kapfhammer 1977). We find them as fetishes, idols in ethnology related to many cultures of the world (Egenter 1990a). And we find such topo-semantic signs also historically in the framework of "lower mythology" (Frazer 1890; Mannhardt 1963) and archaeologically, for example, as life trees depicted in many ways in the Bronze Age (Egenter 1994a, 1994c, 1998*), and very likely, many tectiforms or "female figurines" had similar functions (Egenter 1994c, 1998*). Thus, semantic architecture can be taken as a predomestic type of universally widespread architecture. It was the experimental field of architectural form and meaning.

Domestic Architecture

If thus we consider that the topo-semantic factor is primary in the architectural evolution outlined, we gain new indicators for the development of domestic architecture. The shelter theory reveals itself as a functional retroprojection since huts and houses must be considered as a composed development. Demarcations with predomestic semantic architecture (access place scheme) provided the elementary plan (place and gate markers) to which other elements derived from semantic architecture were added. "House-altar" or "house-god" as place marker and sacred doorposts as gate markers are the primary disposition. From this disposition the ground plan often acts as an extremely conservative factor of traditional house types (Ränk 1949–1951), evidently because the highly valued primary points are related to cyclic cults originally focused on their renewal. The fire as open hearth is considered as an independent building that is transferred into the hut or house, where it keeps its ontological autonomy. The roof, too, can be considered as an independent development from hutlike topo-semantic signs. We will have to explain how—under different cultural implications—it "migrated" to the top of walled huts and houses, either through storage and granaries or through dugout traditions. This hypothetical outline of the evolution of domestic architecture is essentially based on two in-depth ethnographical reconstructions. "In-depth" here means that not only the house but also the dwelling in the framework of the whole culture, including related cults, were studied extensively.

- House and worldview of the Ainu, a study on the level of a hunter gatherer society (Egenter 1991b, 1994b, 1998*).

- The traditional agrarian house in Japan in the framework of rites and cults related to house and settlement (Egenter 1991a, 1998*).

Main result: Both house types are not functional developments. They are accumulations or composite evolutions based on a predomestic topo-semantic stratum. This lower stratum organized living space with cyclically renewed semantic architecture (Egenter 1991b, 1998*, 1994a, 1994b). It is methodologically important that the house has to be studied including the cults and rites related to it.[6]

With these parameters we can reconstruct the evolution of domestic architecture as a process from the semantic level (access-place-scheme). These processes may be seen to begin in the Lower Paleolithic, with early developments in the Middle and Upper Paleolithic and Mesolithic. Maybe its primary phases (*Homo habilis, Homo sapiens sapiens*) provided conditions of demarcated territorial control in which increased memorizing capacity was a great advantage.

Controlled Fire

If with solid arguments (e.g., widespread fire symbolism) we derive "controlled fire" from topo-semantic architecture, it is worthwhile to outline the corresponding field of problems. Traces of fire are recorded very early (Lepoittevin 1996—Olduvai, Ethiopia, about 1.9 million years ago; Ember and Ember 1994—1.4 million years ago). But the sources give no indication of systematic use of controlled fire. Lumley's Terra Amata site near Nice, France (about 380,000 years ago) shows central hearths in some huts. This implies that the fire was well under control. But this control within the hut presupposes preliminary evolutionary steps. If thus we consider the controlled fire as derived of topo-semantic architecture, we gain some indicators for its evolution.

- The origins of fire might no more be searched as a threatening and destructive element of the wild gradually transferred into culture; it might have been perceived right in the center of early culture as self-ignition of topo-semantic demarcation, due to fermented fibrous materials.
- As a topo-semantic element, controlled fire was doubtless an important selective advantage against animal predators and hominid territorial competitors. In addition, it was an important part of the orientation system.
- Doubtless, fire was also an important requisite for hominid diffusion into colder climates. It was of existential significance in certain conditions.
- There are also cognitive aspects. Its mobile flames emanating light and warmth

on top of a construction must have provided strong impacts toward symbolic perception /conception. Further, the flames consuming the artificial structure from which they protrude upward must have been considered as a striking phenomenon.

- And finally, with an increasing constructive cultural paradigm, fire was certainly also used more and more as a weapon.

These are only some hints on how the development of fire could be reconstructed in the framework of an anthropological definition of material culture. The functionally complex aspects of the fire as well as its rich symbolisms and mythical contexts taken as survivals indicate that fire was probably from its beginnings a very strong factor in view of increased capacity for memorization.

"Coincidence of Opposites"—A Primary Cognitive System

Polarity

In view of "semantic architecture," ethnographic conditions show a cognitive element related to topo-semantic demarcation systems that can be derived autonomously already from the rooted type: polarity ("coincidence of opposites"; Egenter 1994a: 22–23; 46–66). In addition, the categorically polar structure of the topo-semantic markers develops a formal dialogue with other elements of the local environment and adapts to the natural form of a tree (Egenter 1981, 1994c), fish, sun-wheels, and so on. We find male-female relations, double-headed snakes, fire-spitting dragons, and finally technomorphous forms, for example, boats. In the ethnological field it is very clear that the allusions to natural form are based on the polarity of the topo-semantic system. The allusions are not naturalistic but based on polar relations; the forms remain dominantly structural, technically defined, and geometric. In prehistory, particularly in regard to rock art, this model can be used to explain how man discovered natural form. The corresponding landscape may be structured according to this model (Egenter 1991b, 1994a, 1994b, 1994c, 1998*). Time is structured in polar relations (Egenter 1991b, 1994a, 1994b) and social structure, too, is articulated in polar relations ("settlement core complex"; Egenter 1991b, 1994a, 1994c).

These short and very schematic points may outline the potential for a tremendous wealth of cognitive processes that were indicated in the *Semiotica* paper (Egenter 1994c). The narrow nature-culture-dichotomy of the nineteenth century (and before) still widely covers up this evolutionary problem of cognition. Primary or "primitive" cultural expressions are searched in the natural domain (phallus cults, etc.). Natural forms are "naturally" presupposed as part of natural history. Present anthropology considers cultural evolution in the framework of processes of millions of years. Evidently the former "nature-culture" shortcuts are illegitimate today. Simplistic dichotomies dissolve into extended processes.

The Aesthetico-Philosophical Revolution of the Middle and Upper Paleolithic

We tried to demonstrate ethnoprehistorically that fibro-constructive semantic architecture, under certain conditions, might have developed an elementary aesthetic principle (polar categorical harmony). This provided a model to cognitively integrate natural forms into cultural conscience. We can assume that the cognitive system of polarity had been a very early outcome of topo-semantic demarcation. It can be related at least to the Middle Paleolithic. It thus would have been active between *Homo sapiens* and *Homo sapiens sapiens*, the later phase of brain extension. Very likely "polarity" triggered an aesthetico-philosophical revolution that is still active in some traditional societies of today. Thus, in this context, too, we have found traits that might have been important in regard to increased brain size.

Language

P. Liebermann (1991) and J. Laitman (1984) maintained that only modern man could have used language. Before *Homo sapiens sapiens*, that is, before about 100,000 years ago, the corresponding mouth and throat anatomy was lacking. Neanderthals did not have vocal anatomy (Laitman 1984). But reconstructions are controversial (Carlisle and Siegel 1978). If, for the moment, we accept the position of Laitman, that the anatomy of language was late in the formative phase of increased brain size, we can definitely exclude language as the "prime mover" in regard to the development of the hominid brain. On the other hand, we gain a fairly important new hypothesis, namely, that language developed on top of an earlier system of communication that used topo-semantic signs. This had provided the basic communication system for hominid night camps, daily mobility, and food control. With the development of tools, this topo-semantic system increased in importance through technical, formal symbolic, and functional differentiations. It meant increasing con-

trol over territory and its contents. If we relate these processes also to the development of artifacts derived from the topo-semantic system, we can assume a fairly rich—fibrous—material culture that acted to a great extent also as a communication system related to spatial organization. If further we take the development of polarity into account, we could also see a fairly rich perception of natural forms, plants, animals, tectonic characteristics, and spatial conditions. In their primary stage, they remained topo-semantically coded. Note that with this fairly rich theoretical framework in mind, we might ask another hypothetical question: Can we find topo-semantic and particularly structuro-symbolic survivals in modern languages? But this hypothesis will be dealt with in another study.

Seven Interactive Processes Involved in Increase of Brain Size

We have outlined evolutionary processes related to "constructivity," or architecture, in the anthropological context. We considered stone tools from their potential to be used as cutters for fibrous materials, which, as it was maintained, might have produced a "first architectural revolution." Seven interactive processes can be distinguished:

1. The transition from rooted to artificially stabilized buildings, which offered, first, the potential for site selection, combinations of materials, and consequently a high potential for formal and functional variations with increasing complexity and stability.
2. The development of (topo-)semantic architecture (signs for migration, dwelling, food control).
3. The potential of other derived artifacts (traps, baskets, storage, weapons, etc.).
4. The development of domestic architecture from semantic architecture (access-place scheme).
5. The development and implications of controlled fire, derived from semantic architecture ("symbolisms of fire").
6. The development of polarity and the cognitive integration of natural forms into human perception; polarity can be considered the "primary ontology" of hominids since the Middle Paleolithic may be related already to early *Homo sapiens*.
7. The development of language (relatively late).

All these processes can be assumed for the period outlined above, the phase of increasing brain size between *Homo habilis* and *Homo sapiens*

sapiens, archaeologically during the Lower and Middle Paleolithic and in time from about 2 million years ago until 40,000 years ago. It is evident that—in great contrast to conventional reconstructions—our prehistory, based on the anthropological definition of material culture, describes an age of "great cultural discoveries" parallel to the period of increasing brain size. This age was initiated basically by the tools but becomes effective only if seen in view of the tools' impacts on preexistent prelithic fibro-constructive industries. If both are combined, they show a tremendous power to relate hominoids and hominids to their environment. Consequently, did the human brain develop with implications that were all ultimately related to construction, to building, to architecture in the anthropological sense? It seems fairly plausible. The brain of modern man did not considerably evolve further in size. This could indicate that this age of discoveries based on constructivity had, on one side, formed a tremendous stress on hominid memorizing capacity but that once this "new order" was accomplished, it became part of human orientation.

TERRITORIAL CONTROL AND SEDENTARIZATION

In a separate paper written for archaeologists, we described in more detail how the same method of superseding prehistorical sources with hypothetical sources reconstructed in the framework of architectural anthropology is also valid in regard to our third subject: increasing territorial control, domestication, and sedentarization. If we look prehistorically at processes related to territorial control, like broad-spectrum food control (Mesolithic), permanent village culture (Neolithic), and formation of cities and states with social hierarchy (Bronze Age), we can clearly assume that these were not isolated events but that they are structurally connected, that they correspond to developmental processes. But how did all these new cultural traits develop? How were the first empires in Mesopotamia, in Ancient Egypt, formed?

The prehistorian takes the finds as "first appearances," lines them up according to the results of dating, and describes the "higher" against the earlier and more primitive. His position is basically hermeneutic—that is, he refers to the sources and interprets them in their specific historical context. In the anthropological framework of material culture the discussion is different. Arguments profit from the systematic approach. The totality of phenomena related to constructivity provides us with a considerable amount of technological, formal, functional, and social conditions that can be used for the interpretation of sources.

Ember and Ember (1994) give the following five sources, or source levels, as important for the corresponding periods.

1. *Middle Paleolithic.* Burials where flowers were used to decorate the place of the deceased (according to pollen analysis, about 60,000 years ago, Shanidar cave in Iran).
2. *Upper Paleolithic.* Rock art with striking female figurines.
3. *Mesolithic.* Broad-spectrum food collecting; increasingly sedentary communities.
4. *Neolithic.* Permanent village cultures with domesticated animals and plants.
5. *Bronze Age.* Formation of cities and states with differentiated social hierarchy (theocracy) and full-time craft specialists.

The first two sources, (1) and (2), of this list are in general attributed to religion. The first stands for the belief in supernatural spirits or souls related to death; the second, to primitive or magic cults and rites. In the framework of architectural anthropology, all five sources can be recognized from a common factor, the topo-semantic element.

1. The burial flowers of Shanidar are interpreted as part of a fibrous topo-semantic system on a level where this includes demarcated resting places for the deceased of a habitat group. The Shanidar finds support the existence of fibrous or fibro-constructive topo-semantic signs for the Middle Paleolithic.

2. Many symbolic representations in rock art such as "tectiforms" indicate that their prototypes were not natural objects but artifacts, partly very explicit hut constructions (tectiforms proper) or objects built and bundled with fibrous materials, partly geometrical (bundled) tectiforms, partly alluding to animal heads or female figurines. Structurally and formally, they all can be interpreted as representations of fibro-constructive semantic architecture as described in Egenter (1994a: plates 1–7). Eventually, they were related to polarity, thus showing traits of an early harmonious ontology. The implications of architectural anthropology for rock art are dealt with in more detail in an article published in *Semiotica* (Egenter 1994c).

3. Prehistory characterizes the Mesolithic by increasingly sedentary communities and by broad-spectrum food collecting. Both characteristics presuppose some rules of arrangement and systems of orientation. This is discussed in archaeology gradually (landscape archaeology), but the approach has difficulties because there are not sufficient sources of information. However, in the framework of an anthropological definition

of material culture, the concept of broad-spectrum food collection can be used as a comparative basis to ethnology. As mentioned above, among the Ainu, we can clearly show that broad-spectrum food collection is definitely related to a fibrous topo-semantic system (Egenter 1990a, 1991b, 1994b). Using highly valued topo-semantic signs, called *inau* (the Ainu word for sign[s]) in nuclear (dwelling) and peripheral conditions (food control), space is controlled through "threshold points" in a system of categorically structured polar units of space, extending from small local dwelling conditions to considerably larger valley systems (Watanabe 1973). This complex system of categorical polarity is also used to control time, to define social roles, and to organize cooperative interactions. In short, comparison with the culture of the Ainu provides indicators of the structural conditions and ontological principles on which this type of territorial control could have developed. Very likely, there was not only broad-spectrum food collection; the dwelling environment would have to be assumed under similar control (see Figure 3.6).

4. The Neolithic period represents permanent agrarian settlements and domestication. Wilson (1988) described these processes in the framework of conventional cultural anthropology. More or less permanent occupation of a defined territory became important with pastoralism and agriculture. Note that plants and animals were also domesticated. But how were settlements organized, protected? In the framework of architectural anthropology, we can assume that the topo-semantic demarcation systems that had developed earlier in the Mesolithic period with broad-spectrum food control became dominant and highly valued in Neolithic times. Five processes can be reconstructed:

- First, nuclear demarcation systems must have gained great importance with permanent settlements. Village boundaries were not traced peripherally but were set up at nuclear points of the settlement. Its territory was defined from inside out with relatively vague outer boundaries. Polar categories expressed by the demarcation were projected onto adjacent surfaces.
- In increasingly permanent habitats, the pars-pro-toto relation of the sign and the corresponding territory had become firmly established. Intrusion with other signs or destruction of a settlement's sign by intruders amounted to a declaration of war. Among those who adhered to the same system, the signs became some sort of mutual constitutional law and consequently, a means of protection of permanent settlement against intrusion by outsiders.
- The structural condition of the signs, or the expression of permanent categorical polarity, had become an established ontological value, particularly by the cognitive processes it had provided (cognitive integration of natural forms; signs

as models of harmonious organization of space, time, and social relations). This symbolic or aesthetic value system, too, provided protection against intruders if they adhered to the same values.

- In addition, permanent dwelling in the same territory created social hierarchy based on the cyclically renewed topo-semantic demarcation system. The founder who first occupied the land for the settlement is considered initiator of the existence of all later inhabitants. The cyclic renewal of the demarcation system functions as archive for the settlement foundation. The lineage of the founder house plays a dominant role in the cyclic renewal of the demarcation system (personal unity of social roles as land organizer, ruler, and priest; "settlement core complex"; see Egenter 1994c).
- The fibro-constructive topo-semantic system was used primarily as a nuclear control of the settlement and/or individual dwellings, but it was also used for agricultural production. In the wider habitat, it functioned as a nonwritten constitution and thus protected the settlement.

Thus, theoretically, what we call "semantic architecture," acting as nonwritten archives of settlement history, must have been of basic importance in Neolithic settlements. The archaeology of the Neolithic period provides only fragmentary sources for this hypothesis. But, using the "metabolism-theory" of W. Andrae related to Mesopotamia and Ancient Egypt (1930, 1933; Egenter 1994a, 1998a), it can be inferred that "proto-dynastic" or Neolithic villages had similar institutions of territorial control. There are very clear indicators for this, for example, in predynastic Egypt (cult-boats on pottery). The high plausibility of the hypothesis is supported mainly by the wealth of sources found on durable materials in the Bronze Age and the early city and state cultures. This will be discussed in the following.

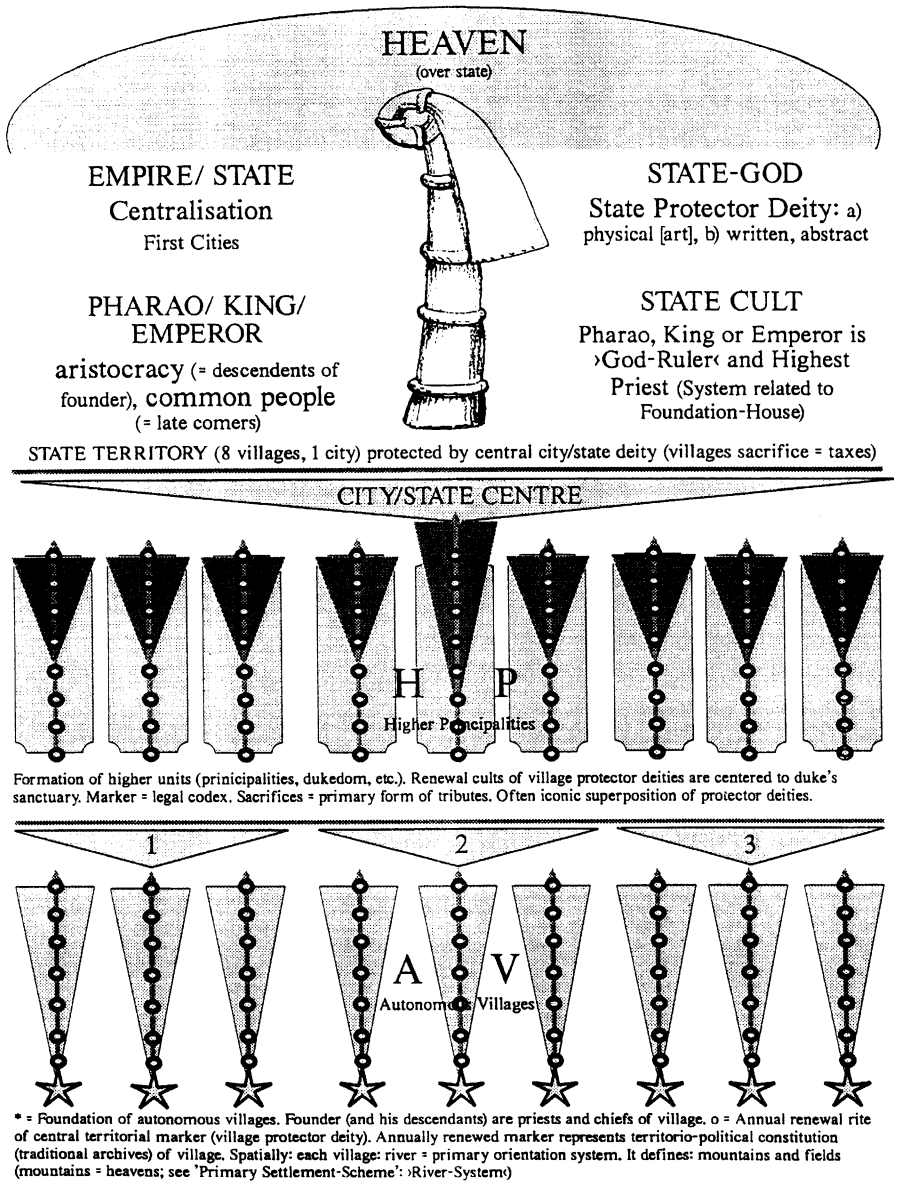
5. In the framework of Bronze Age archaeology, there are many attempts to clarify the basic impulses that led to the formation of early cities and states (Ember and Ember 1994). Focuses are on irrigation systems, population growth, and trade. None are convincing. However, if we interpret many sources of early civilizations, not trying to understand them historically as a beginning or invention but trying to understand them anthropologically, as part of a transitional field, many sources appear in a very plausible new light. In more detail: If we assume a substrate of village cultures with cyclically renewed fibro-constructive topo-semantic demarcation systems as their ontologically highest types of material culture (sanctuaries, temples, seat of deities), we could easily understand that the transformation of this fibrous type of material culture into durable form—its "metabolism" into enlarged monuments—

must have had important impacts. Temporally it meant a transition from cyclic time to linear time. Socially the locally developed political structure (settlement core complex; Egenter 1994c) is lifted to a higher level (unity of ruler, territorial representant, king). Spatially this implies extended territorial control. Monumentalized demarcations of the centralized topo-semantic system are diffused into peripheral agrarian settlements to bring them under control (central cult with tributes, tax administration, priests) (see Figure 3.9).

Many archaeological sources of Mesopotamia and Ancient Egypt support these structural developments of a monumentalized topo-semantic system (Egenter 1995). There are a lot of sources related to demarcations. We find signs of deities (Ishtar), Mesopotamian border stones with drawings of fibro-constructive huts (British Museum), the whole history of life trees, temples with metabolized reed-sanctuaries, bundle columns (Djed pillar; pillar of Egyptian unity on thrones), and pylons alluding to fibro-constructive implications, in particular to reed construction (Ancient Egypt, Mesopotamia). There are many sources that document sanctuaries with fibrous topo-semantic markers arranged according to the access-place scheme (Egenter 1994a: 31, 32). Very important are the earliest script tablets of Uruk (Egenter 1984, 1998*, focusing on the origins of script). Most of these materials clearly indicate their fibro-constructive roots (Andrae 1930, 1933; Heinrich 1957). Most important is the Egyptian cult system and its constitutional evolution (Kees 1980). In the framework of recent postmythical Egyptology, Kees describes the Egyptian state formation as a development from local settlement cults to regional settlement clusters and finally to the imperial cult system with its territorio-political implications.

We illustrated the function of topo-semantic demarcation (or semantic architecture) in the evolution of territorial control. In its monumentalized form the primary fibrous topo-semantic element develops into a new civilizational factor. The temple (or the temple city) uses the monumentalized topo-semantic element to extend its territorial control over large stretches of agrarian village clusters. In short, Can architecture be seen as an evolution of topo-semantic demarcations? Can culture in some important traits be related to topo-semantic and structuro-symbolic architecture? Did this evolution leave imprints in human brains? Is the topo-semantic paradigm still part of human orientation and communication but has been voided of its contents by the introduction of homogeneous space concepts and rationalized aesthetics?

Figure 3.9. Principles of early state formation. This model is based on Kees (1980), on semantic architecture (Ishtar sign) and the settlement core complex (Egenter 1994c).



MAN AND ARCHITECTURE, A NEW VIEW

We have seen that architecture in its widest anthropological sense is intrinsically interwoven with protohuman and human existence, with the development of culture, and finally, with territorial control of the early civilizations. Very likely man owes essential traits to early architectural activities, his physical form, namely, bipedal position, hand capacities, and flattened face with refined stereoscopic vision. Even the enormous extension of the human brain might be related to early processes of architectural evolution. The earliest tools allowed the emancipation from rooted buildings. An enormous wealth of new techniques, forms, and functions had to be learned; new relations of signs, places, and things had to be memorized. Larger brains were selectively of advantage. In the framework of anthropology, we plausibly hinted at a cognitive intensity where archaeology with its rather limited finds would not assume it. But the evolving brain justifies an "age of great discoveries" among early hominids. A wealth of new artificial and natural forms was integrated into cultural perception. Buildings were the models of cognition. Buildings enabled early civilizations to become effective.

Premodern architectural teachings had always had some vague idea of the "deep structure" of architectural form. Particularly in "high" architecture, origins were related to the highest values, to the divine, to creation. Coded forms like the Ionian or Corinthian column or the Greek temple front survived more than 2,000 years into our times. Is there, maybe, a new—an anthropological—truth in this? Did these columns as signs and symbols in their originally fibrous forms contribute to hominization, to culture, to civilization? Were they important in the formation of art, aesthetics, and philosophy—maybe also for the origins of religion?

Modernism boldly introduced homogeneous space concepts borrowed from physics and astronomy into the human domain of dwelling and living. To a great extent this dissolved the anthropologically evolved topo-semantic system of space organization. Man lost his fundamental relation to place, became increasingly planned as a dynamic entity, a particle in the physical sense that can be moved anywhere and that is supposed to be active in whatever ways. The introduction of functionalism from industrialized technology further helped to cut architecture off from its "deep structure." The architect got rid of his role to learn from the past, declared himself as "discoverer," as "creator" of the ever new. Unfortunately, since the breakdown of modernism we know that

these autocratic creations are not as sustainable and eternally valid as many had thought before. And, according to a prophecy of master architect Mario Botta (1997), postmodernism, its hastily propagated successor, has already reached its definite end: garbage for the future!

In this period of short-lived architectural theories based on pragmatic rationalizations and subjective aesthetic ideologies, architectural anthropology has some fairly clear functions. First, some methodological ones.

- It provides an intersubjectively controlled empirical domain in which terms, hypotheses, and theories are scientifically reliable.
- It creates a considerably wider horizon of "objects" for an inductively proceeding and systematic architectural research.
- It reconstructs architecture as a primary process of cultural evolution and thus sheds new light on the deep structure and cross-cultural significance of architecture.
- It places man in the theoretical center and thus fulfills an important need for a dominantly humanistic theory of architecture.
- It searches for constant factors in the strings of developmental processes. They might be important in finding new anthropologically valid solutions.
- It constructs a wider interdisciplinary forum that not only represents the interests of architectural circles and their supporters, but suggests a wider participation of the humanities, of anthropology, and of their many subdisciplines.

With the increasing urbanization of the world (Istanbul II), architecture has evolved into a much wider perceptive domain; it has become an important part of the human condition. Architecture cannot merely be considered as "art" anymore, producing "slums" at its opposite theoretical end. Neither can architecture simply be rationalized within its own circles. We must adapt our methods toward wider global horizons, toward anthropological perspectives. Architectural theory is a matter for the humanities! The humanities will show us the factual complexity of the architectural product in its relation to man. Anthropology provides the systematic framework to understand these wider meanings. We have shown just one example, the reconstruction of the architectural deep structure in the field of hominization. The result is remarkable. It reveals the demiurgical long-term impacts of architecture. Very likely man owes two essential features to his architectural past, his vertical body posture and his enlarged brain. In addition, man as the increasingly domesticated and sedentary species is a highly relevant aspect of the present human condition.

Very likely, it is the interdisciplinary access that makes architectural

anthropology particularly valid. Architectural theory appears adapted to the humanities, to anthropology, and thus makes a step toward science.[7] The architectural structure is accessible to the anthropologist.[8] Very likely, pressures for the fundamental revision of architectural teachings will come from this other, scientific side, particularly if anthropologists become aware that architecture as part of modern education is still structured like a myth ("postmedieval myth of the profaned creator genius") and therefore faces great difficulties to describe its relevant objects and goals in modern scientific ways.

NOTES

1. See Egenter 1992 for an essay on theoretical approaches (Soeder, Rykwert, Read, Andrae, Yerkes) discussing the basic concept. Also described are the four main classes of subhuman, semantic, domestic, and sedentary architecture, indicating an evolutionary sequence of anthropologically relevant architectural types. Semantic architecture is theoretically introduced and ethnographically documented in Egenter 1982, 1994a, and 1998a. The methodological structure of this new type of architectural research and its wider cross-cultural implications appears in Egenter 1995. Aspects related to prehistory are outlined in Egenter 1994c. For a detailed survey of nest-building behavior related to Joseph Rykwert's *On Adam's House* (1972), see Egenter 1982, 1998*.

2. The (*) following the year in parenthetical citations refers to the file "Research Series Online" found on the Web site for the Documentation Office for Fundamental Studies in Building Theory (DOFSBT). The URL is: http//home.worldcom.ch/~negenter.

3. The term *fibro-constructive industry* (or technology) is a very important term in the framework of the anthropology of architecture and habitat. It implies a new category of material proto-culture in the archaeological periodization scheme with a temporal depth of at least 15 million years ago (nest-building behavior of the Miocene apes) and a striking continuity into the material culture of modern traditional societies. Archaeologically it can be shown with various types of durable sources (rock art, tectiforms, plant ornament, early script, "life trees," architectural forms such as columns, etc.).

4. There is a clearly recorded case of a gorilla settlement (Izawa and Itani 1966; Egenter 1983, 1998*). This supports our suggestion of a primary sedentary element, the assumption of spatial organization defined by fibro-constructive demarcations. The nests of the group form a night camp of distinct spatial organization (value centrality and access-place scheme).

5. The term *topo-semantic* is introduced by the anthropology of habitat and architecture. It characterizes the basic function of place markers (semantic architecture) within habitats. Topo-semantic systems are considered as a primary nonverbal type of communication.

6. Note that this method dissents from the one used by Amos Rapoport (1969). He takes the house as a unit that is supposed to develop differently under diverse

culturo-geographical conditions (three factors). Evidently this remains very vague and highly schematic and does not help us to really understand house form. Rapoport neglects the ritualistic component that he attributes in the conventional sense to religion and thus to the sociocultural factor. He is not aware of the architectural aspects of ritual demarcations. The best example is his article on the Australian aborigines (Rapoport 1975). His mention that they seemed to have no huts hints to the fact that they had imported foreign types of primitive structures into their culture relatively recently. Surprisingly, Rapoport very clearly describes the ritualistic spatial arrangement but was not aware of the potential that this arrangement of signs and symbols represents as a primary type of predomestic topo-semantic architecture. The aborigines described by Rapoport would thus show a predomestic type of dwelling. The example also indicates the theoretical problems of the pragmatic approach. Its definitions risk questioning from a wider anthropologically defined field of observation (Egenter 1992). The absence of the ritualistic factor related to vernacular architecture is also one of the essential handicaps of the *Encyclopedia of Vernacular Architecture of the World* edited by Paul Oliver (1997). It isolates house form from a primary topo-semantic demarcation system that created its traditional plan and its aesthetic conditions. Consequently, the house risks being explained with highly questionable modern functional projections.

7. Note that this adaptation is not an easy task. It implies competence in many different disciplines, subdisciplines, and special fields.

8. For instance, the anthropological definition of material culture as suggested in this chapter might lead to new methods in postprocessual archaeology (Hodder 1992). Spatial and symbolic codes to interpret architectural sites (house, settlement, rites, and cults) could be reconstructed in the uppermost and vital stratums of ethnology (Egenter 1994a).

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