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The challenge of the abstract mind: symbols, signs and notational systems in European prehistory

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ABSTRACT – *Since the earliest manifestations of symbolic activity in modern humans (*Homo sapiens sapiens*) in the Upper Palaeolithic, there is evidence for two independent cognitive procedures, for the production of representational images (naturalistic pictures or sculptures) and of abstract signs. The use of signs and symbols is attested for archaic humans (*Homo neanderthalensis*) and for Homo erectus while art in naturalistic style is an innovation among modern humans. The symbiotic interaction of the two symbolic capacities is illustrated for the visual heritage of Palaeolithic cave paintings in Southwestern Europe, for rock engravings in the Italian Alps (Val Camonica) and for the vivid use of signs and symbols in Southeastern Europe during the Neolithic. Around 5500 BC, sign use in Southeastern Europe reached a sophisticated stage of organization as to produce the earliest writing system of mankind. Since abstractness is the main theme in the visual heritage of the region, this script, not surprisingly, is composed of predominantly abstract signs.*

IZVLEČEK – *Od prve uporabe simbolov pri modernih ljudeh (*Homo sapiens sapiens*) v mlajšem paleolitiku so znani dokazi o dveh neodvisnih kognitivnih postopkih, ki ju predstavljata ustvarjanje naturalističnih slik ali kipov in ustvarjanje abstraktnih znakov. Uporaba znakov in simbolov je izpričana pri neandertalcih (*Homo neanderthalensis*) in za vzravnanega človeka (*Homo erectus*), medtem ko je naturalistična umetnost inovacija modernega človeka. To medsebojno prepletanje simboličnih zmogljivosti smo ponazorili pri dediščini paleolitskih jamskih slik Jugozahodne Evrope, pri skalnih gravurah v italijanskih Alpah (Val Camonica) in pri živahni uporabi znakov in simbolov v neolitiku Jugovzhodne Evrope. Okoli leta 5500 pr.n.št. je dosegla uporaba znakov v Jugovzhodni Evropi visoko raven organiziranosti in nastal je najzgodnejši sistem pisave v zgodovini človeštva. V pisavi prevladujejo abstraktni znaki, kar ne preseneča, saj je abstrakcija glavni motiv slikovne dediščine te regije.*

KEY WORDS – *symbolic activity in humans; representational images; abstract signs; early experiments with writing*

INTRODUCTION

Man/Woman The Symbol-Maker

Man is known as the tool-maker (*Oakley 1961*). For a long time, this image was the only one that spurred scholars with an interest in human evolution. Much later, the image of woman the gatherer was added to complete the picture (*Cashdan 1989.28 ff*). Yet there is still another capacity which is as essential as a marker of human evolution, and this is symbol-making.

"The symbol-making function is one of man's primary activities, like eating, looking, or moving about. It is the fundamental process of his mind, and goes on all the time" (*Langer 1942.32*).

Ever since modern humans (*Homo sapiens sapiens*) colonized the European continent, they have left visual traces of their symbolic activity in self-created

cultural environments. These experiments with culture have yielded remarkable variations in space and time. If human beings' general capacity for symbol-making is the key to culture, then the ability to distinguish between divergent cognitive procedures to produce different categories of symbols is the practical approach to constructing culture. These procedures include iconicity (image-making as expressed in naturalistic pictures) and abstraction (as expressed in motifs such as dots, strokes, circles, etc.).

There has been much speculation among scholars about peoples' ability to make symbols in the Palaeolithic Age. Was *Homo sapiens* capable, from the beginning, of expressing him/herself in abstract symbols, or did this ability develop at a later period? In earlier research, the potential of the abstract mind in early humans was widely underestimated and, still nowadays, many scholars believe that abstract symbolism originated relatively late, later in any case than the oldest manifestations of rock art in Europe. What caught the eye of the discoverers of the painted Palaeolithic caves of Southwestern France and Northern Spain were naturalistic of animals, and these easily dominate the modern viewer's attention also. It is therefore quite understandable that, until recently, abstract motifs were explained as originating from naturalistic forms, identifying abstract symbolism as a secondary capacity of the human brain (see *Lorblanchet 1989* for traditional views). In fact, the pictorial heritage of prehistoric people contains an array of abstract motifs (e.g. dots, strokes, grids, nets). However, the existence of abstract motifs in the picture friezes of the Palaeolithic caves was hardly taken note of, and the repertory of abstract signs was long marginalized in scholarly research. Modern analyses of Palaeolithic rock art pay due attention to both pictures and abstract motifs (*Clottes and Lewis-Williams 1996.62 ff*).

Fig. 2. A painted panel from the La Tête du Lion Cave (Ardèche) (after* Clottes and Courtin 1996. 165*).

Fig. 1. The oldest man-made notches on a bear's skull from the Azykh Cave in Azerbaijan (after* Gusejnov 1985.16*).

The panels where abstract motifs appear are as old as the friezes with pictures in representational style. Consequently, humans have demonstrated a capacity to produce both representational images and abstract signs from the times of their earliest cultural activities onward. The synchronic manifestation of this dual visual capacity provides evidence that the sense of abstractness is not a secondary achievement in the cultural evolution of humans, but is as primary as the sense for representation. It is noteworthy that this duality as expressed in rock art exhibits a parallel in "the appearance of both representational and non-figurative mobile art" (*Straus 1990.293*).

Fig. 3. A painted panel with a variety of different abstract motifs in the El Castillo Cave (Santander) (after* Clottes and Lewis-Williams 1996.76–77*).

ICONICITY AND ABSTRACTION IN VISUAL REPRESENTATION

The Evolutionary Stages of Symbolic Activity

This elementary insight into the synchronic working of the two cognitive procedures (i.e. iconicity and abstractness) in modern humans notwithstanding, we are left with the question: what was first in the visual manifestation of symbolic activity, the representational or the non-figurative? In order to find a reliable answer to this question the modern observer is challenged to extend the search for the origins of symbolic activity beyond the appearance of modern *Homo sapiens* into the cultural horizon of other hominid species. There are indeed very old traces of the use of signs by hominids.

The oldest cultural strata so far known which contains such evidence is found in the Azykh Cave in the Karabakh Mountains (Western Azerbaijan). Here, archaeologists discovered a fireplace around which the bones and jaws of bears had been placed. The bear skull, the lower jaw of which had been removed, attracted much attention, and for a certain reason. The skull bears notches which were intentionally carved (Fig. 1). "All the notches are made by dented tools with bifacial edges. The notches seem to be related to some religious ideas of the Azykh people. The skull notches in Azykh are the most ancient in the world" (*Gusejnov 1985.68*). The positioning of the skull near the hearth is noteworthy, as is the assembling of two lower jaws from bear skulls in the form of a cross. Judging from circumstantial evidence, one can assert some magical purpose in connection with a cult of the cave bear.

The cultural strata with this particular find dates back to the Lower Acheulian period, to about 430 000 years BP. Those who lived in the Azykh cave at that

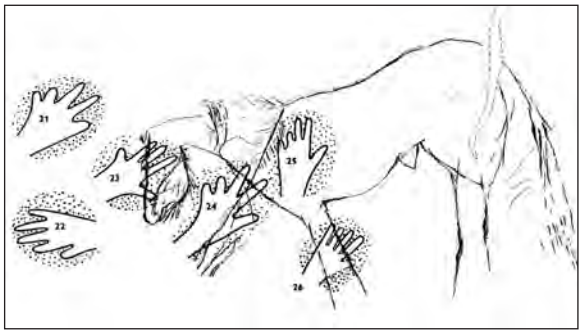


Fig. 5. An animal engraving in association with hand stencils from the Cosquer Cave (Bouches-du-Rhône) (after* Clottes and Courtin 1996.73*).

Fig. 4. An ensemble of painted dots in the El Castillo Cave (Santander) (after* Clottes and Lewis-Williams 1996.93*).

time were representatives of the hominid species *Homo erectus*, who lived between 1.9 and 0.4 million years BP. The beginnings of abstract symbolism lie with *Homo erectus*. However, no visual manifestations of a sense of naturalism are known from this hominid species. Similarly, the cultural record of archaic *Homo sapiens* (*Homo sapiens neanderthalensis*) also lacks mobile art in a naturalistic style, although there is evidence for abstract symbolism; e.g. a cross scratched on a fossil *nummulite* from Tata in Hungary, dating to c. 100 000 years BP.

"In the preserved media, *Homo sapiens neanderthalensis* produced non-figurative graphics (*e.g. Marshack 1976*), and on the present view, image-

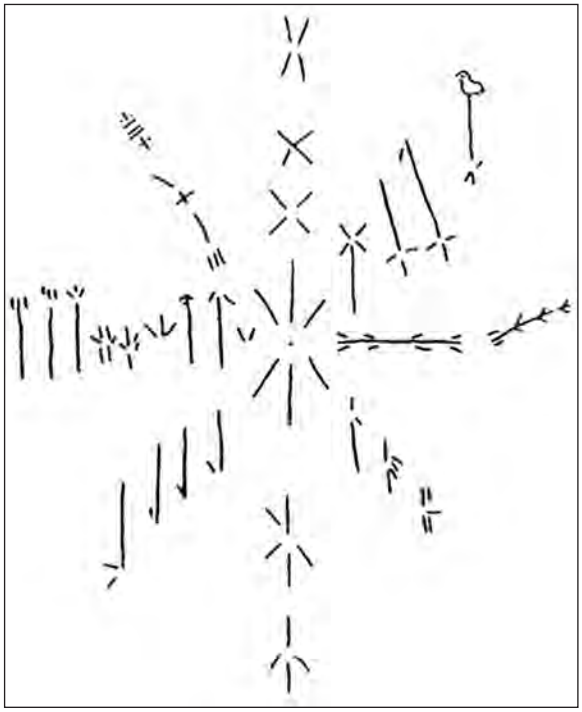
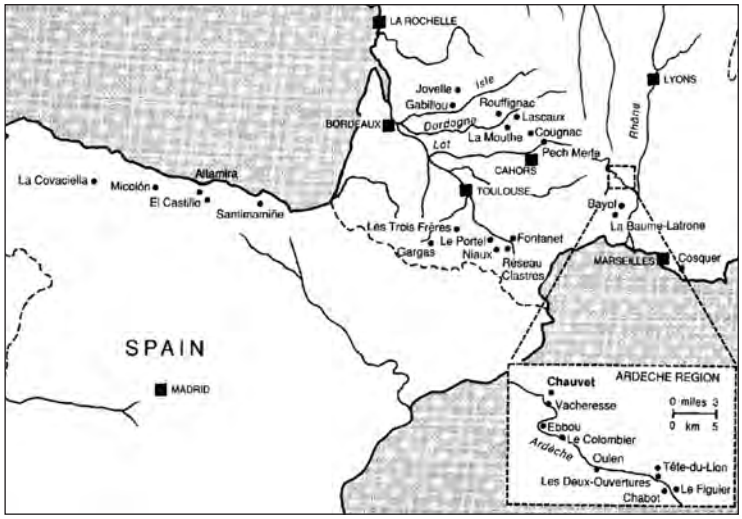


Fig. 6. A general diagram of the "disjointed" signs in the Lascaux Cave (after* Ruspoli 1987.155*).

making is associated with the technologically 'modern' Upper Palaeolithic culture of *H. sapiens sapiens*" (*Davis 1989.180*). Most of the archaeological evidence for symbolic activity "comes from the Mousterian period and the Eurasian area of Neanderthal habitation" (*Marshack 1990.459*). The use of red ochre, perhaps symbolizing blood or the life force in general, is evidenced for archaic *Homo sapiens* since the Late Acheulian period (c. 120 000 years BP).



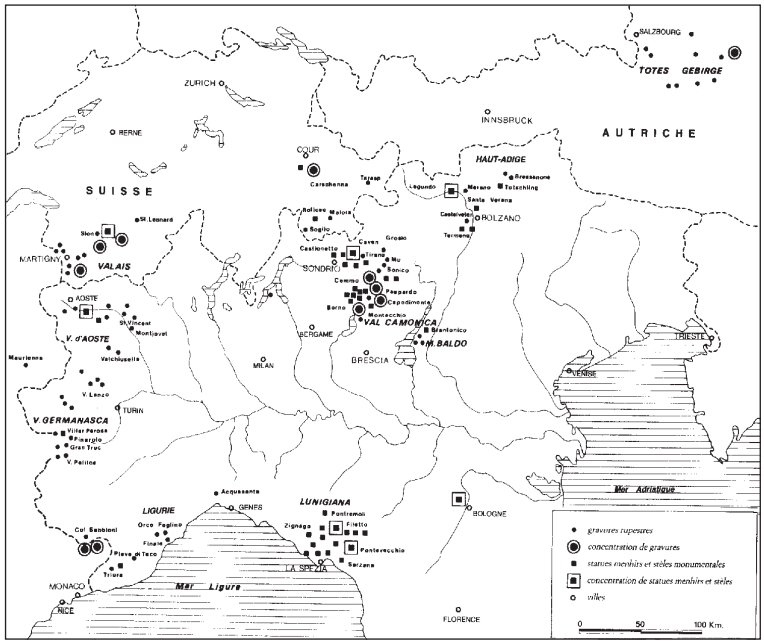
Map 1. Major Palaeolithic caves in Southwestern Europe (after* Chauvet et al. 1996.13*).

In a cross-hominid comparison, the manifestation of abstract symbolism speaks in favour of an inter-species continuity. Consequently, the question of what was first in the visual record, images or abstract motifs, can be answered by identifying the latter as the older category. On the European continuum from archaic to modern *Homo sapiens* we find a chronological scaling of iconicity and abstraction. In the Middle Palaeolithic (beginning c. 63 000 years BP), in the cultural horizon of archaic man, there is evidence for abstract motifs only (as incisions and/or ornaments). "The earliest examples of fully figurative art appear in the Aurignacian technocomplex..." (*Kozłowski 1990.434*), that is, its earliest evidence for the cultural horizon of modern man is no older than c. 35 000 years BP. This time lag in the appearance of representational art is evidence which counters earlier assumptions according to which visual motifs as expressions of a sense of abstraction in *Homo sapiens* were derived from iconic sources (*e.g. Lorblanchet 1989. 133 ff*). Later, in the Upper Palaeolithic, the synchronicity of naturalistic representation (e.g., animals, human beings) and the presence of highly abstract motifs (e.g., grid, circle, dotted line) in the pictorial record highlights the independent functioning of the two capacities (image- and symbol-making) in modern humans.

SYMBOLIC ACTIVITY AND THE SENSE OF ABSTRACTION IN MODERN HUMANS

Iconicity and abstractness as fully-fledged capacities, documented for the horizon of modern humans, mark a leap in the evolution of culture when compared with earlier hominid species that lack iconicity. Representational art is an innovation that fits in with the overall picture of the revolutionary transition from the Middle to the Upper Palaeolithic.

The dual capacity to produce signs of both categories has been perpetuated and developed through the ages. The ways in which iconic and abstract signs interact in the visual record of modern humans vary considerably. I refer here to three regions of Europe, where the cultural heritage testifies to lively symbolic activity in prehistory: Palaeolithic cave painting



Map 2. Val Camonica and other areas with rock art in Northern Italy (after* Anati 1979.52*).

Fig. 7. Catalogue of motifs found in the rock engravings of Val Camonica (after* Anati 1979.72*).

in Southwestern Europe, the area of Camunian civilization in the Italian Alps and, Southeastern Europe.

The visual record of Palaeolithic cave painting

Most of the Palaeolithic caves in Southwestern and Southeastern France and Northern Spain were discovered in the 19th century and in the first half of the 20th century (Map 1). Some spectacular discoveries were made in the 1990s. The Cosquer Cave (Bouches-du-Rhône) near Marseilles, with its underwater entrance, was discovered in 1991, and the Chauvet Cave (Ardèche) in 1995. The paintings and engravings at Chauvet are the oldest so far known, dating back to 32 410 BP. The oldest radiocarbon date for the Cosquer Cave is 27 110 BP. The dates for the other caves are later, ranging from 25 120 BP for Cougnac (Lot) to 11 600 BP for Le Portel (Ariège) (*Chauvet et al. 1996.131, Clottes and Lewis-Williams 1996.54*).

The paintings in the caves of Southwestern France and Northern Spain show a great variety of pictorial elements and their groupings. There are panels comprised of representational images, primarily of animals and, in some ensembles, of human beings. Animals also feature in isolation. In a number of friezes one finds, in addition to animals, various abstract motifs, singly or in groups.

Where pictures of animals appear in close association with abstract motifs – as in the case of the aurochs, with a set of dots painted above the back line of the animal (Fig. 2) – it becomes clear that the visual elements of both categories (iconic and abstract) form a meaningful unit, although the interpretation of the narrative groupings in question remains, for the most part, speculative (see *Anati 1989.95 ff* for a variety of interpretative approaches). There are painted cave walls with abstract motifs only (Fig. 3). In many caves, abstract motifs may appear in isolation, and certain individualized forms may appear in groupings having no association with other motifs (Fig. 4). In this case, the dot is the basic motif, and is featured on the wall in rows of three (extending from left and right) and in fours (in a vertical alignment). Iconicity and abstractness may even form a symbiotic unit, as in the case of settings with an image of an animal (horse) superimposed over traces (with the silhouettes painted in black) of human hands (Fig. 5).

The images in such panels are obviously meaningful components in narrative sequences, the meanings of which have, so far, defied convincing interpretation. The abstract motifs must have been highly significant markers in the context in which they appear. This can be deduced from the fact that certain motifs which abound in some caves are absent from others. This is true for the so-called "disjointed" signs which are typical of Lascaux (Dordogne), but are absent from other caves (Fig. 6).

Images and symbols in the rock art of the Southern Alps

There is another area of Europe where the local peoples' symbolic activity has crystallized in thousands of pictures which were all engraved in stone: Val Camonica in the Italian Alps (Map 2). The Camonica Valley is an administrative division of the Italian province of Brescia. The area has been continuously inhabited since the late sixth millennium BC. In pre-Roman antiquity, the valley was settled by the Camunni. Ethnically, the Camunni belonged to an ancient Mediterranean population which was not Indo-European. The language of the Camunni was written in a variety of the Etruscan alphabet (*Amiotti et al. 1994.19 ff*).

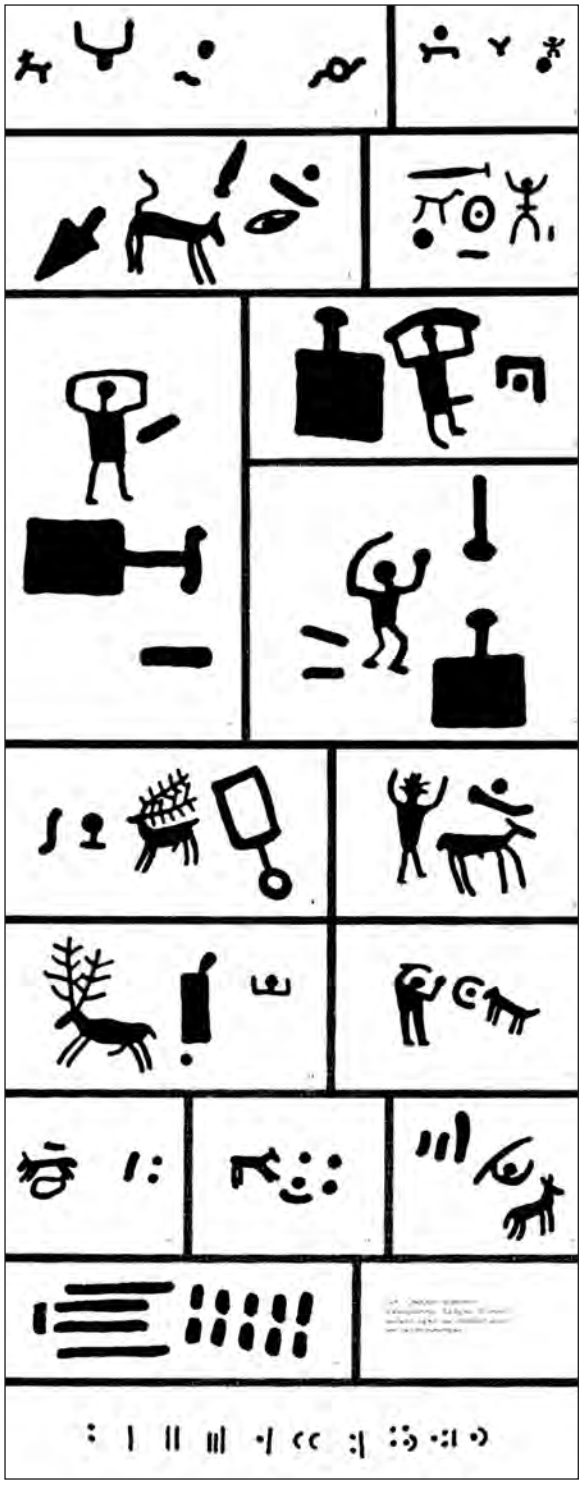


Fig. 8. Images and signs in the rock engravings of Val Camonica (after* Anati 1979.126–127*).

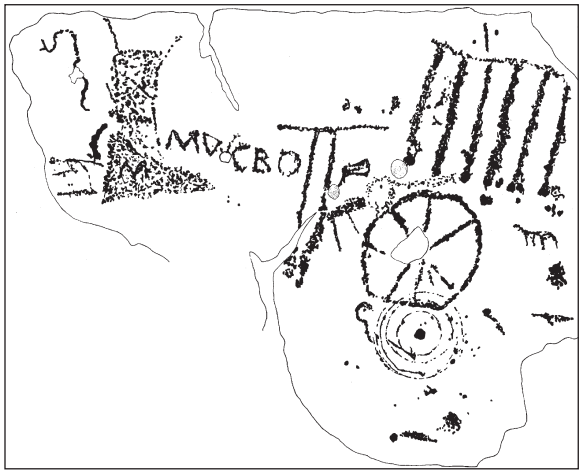


Fig. 9. A panel with naturalistic pictures, non-figurative motifs and alphabetic writing in Val Camonica (after* Anati 1979.124*).

The time span when rock engravings were executed extends over six thousand years, until the Middle Ages. Although the visual record of human symbolic activity in Val Camonica is not as old as the cultural heritage of Palaeolithic cave painting in Southwestern Europe, the setting in the Italian Alps is of particular interest for the study of images and symbols. The tradition of rock engravings shows continuity from the pre-literate into the literate period. The approximately seventy short inscriptions in Camunian were all scratched into the surface of rocks.

The pictorial record of the picture panels in Val Camonica contains many individual motifs, iconic and abstract, which may be classified into five major categories (Fig. 7):

❶ anthropomorphic figures, some shown in action (e.g. I/12 – a man ploughing, III/6 – a warrior with a sword, V/2 – a rider with a spear and shield);

❷ zoomorphic figures representing different species of land animals (e.g. I and II), birds (III) and fishes (e.g. IV/1);

❸ constructions (e.g. I), vehicles (e.g. II) and devices (e.g. III);

❹ weapons (e.g. I), tools (e.g. II) and utensils (e.g. III);

Fig. 10. Bone artefacts from Mezine (Ukraine) with incisions (after* Kozłowski 1992.Pl. 41*).

❺ abstract and geometric signs (e.g. circle, triangle, square, spiral, grid, dot), alphabetical signs (e.g. II/10 and II/11).

In the friezes at Val Camonica, iconicity and abstractness often display a symbiotic interaction, with visual elements of both categories featuring in the same context (Fig. 8). Apparently, some settings comprised exclusively of strokes and/or dots, point to the use of these signs as elements in a system of numerical notation (see also below).

The world of literacy had opened up to the Camunians in the pre-Roman era. Writing technology was exported to the region from the Etruscan cultural centres of Etruria (*Haarmann 2004.57*). Alphabetical writing was used in the same contexts and on the same material as the pictures and non-figurative motifs, i.e. on rocks. In some contexts, the writing and images form a symbiotic unit (Fig. 9). The Latin word MUCRO means 'short sword, large dagger'. This type of weapon is depicted to the left, and is typical of the Iron Age of Northern Italy.

The visual heritage of rock art in Val Camonica testifies to the symbiotic interplay of pictures, abstract motifs and writing. Writing was imported in this cultural area from elsewhere. Contrasting with these settings is another region where a writing system originates amidst an intensive use of signs and symbols, and this is Southeastern Europe.

The trend toward abstraction in Southeastern Europe

In certain regions, the archaeological record of cultural symbolism reveals a marked trend toward abstraction. This was true of Southeastern Europe and adjacent areas from the Mesolithic. Illustrative of the richness of abstract signs and the great variety of forms are the incisions on bone artfacts from the Mezine site near Novgorod-Seversk (Ukraine) which is dated to c. 15 000 years BP. Among the signs occurring most frequently are the meander, the V sign, parallel wavy lines, the triangle, and the lozenge (Fig. 10).

The sense of abstract that dominates cultural symbolism in the Neolithic was obviously inherited from earlier periods. A link between the visual heritage of Mezine and the Vinča tradition of signs and symbols of the sixth millennium BC is the cultural symbolism of the sites in the Danube Gorges, the best known of these being Lepenski Vir, a seasonal settlement which flourished in the seventh millennium BC (*Borić 1999*). According to Kozłowski (*1992.20*), this Mesolithic culture may have been based on foundations laid by migrants from Central Europe who occupied sites in the Danube Valley between about 29 000 and 27 000 BP. On the continuum of cultural evolution, the complex of Lepenski Vir (*Ivić 2000*) is the immediate predecessor of the Vinča tradition (see *Brukner 2002* for an outline). In the visual heritage of Lepenski Vir, one finds the basic abstract forms well known from the later Vinča continuum (see below). Most illustrative is an assemblage of signs on a spherical stone (Fig. 11). Such abstract motifs repeat themselves, with a delay of several hundred years, in the inventory of Vinča

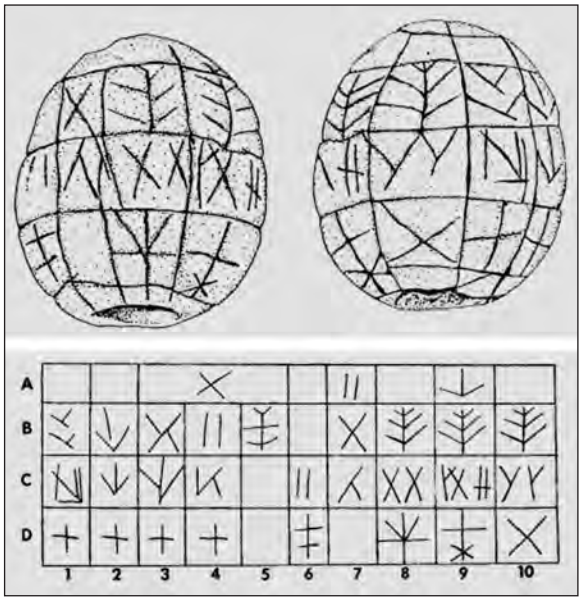


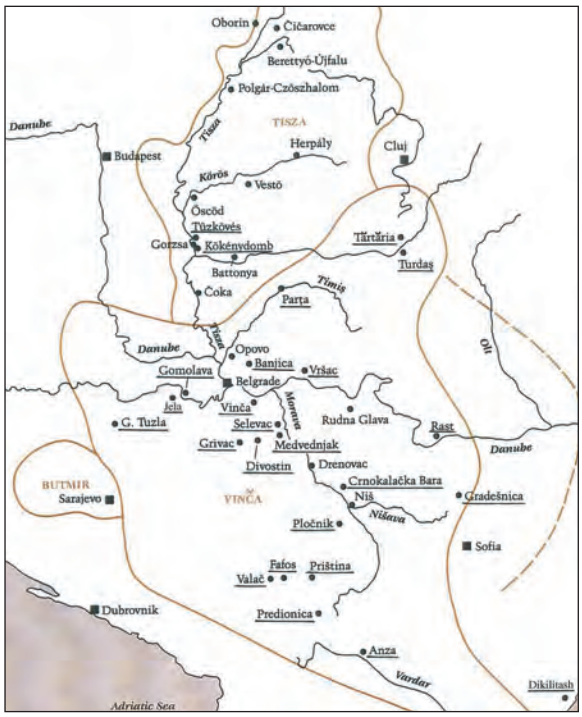
Fig. 11. A spherical stone from Lepenski Vir with incised signs (after* Winn 1981.259*).

signs. It is still a matter of dispute how closely the cultural symbolism of Lepenski Vir is related to that in the Vinča region. The objects with incisions from the sites in the Danube Gorges are still too few to determine whether the tradition of the Vinča script may find its ultimate roots in the seventh millennium BC.

COMPLEX SYMBOLIC ACTIVITY AND EARLY EXPERIMENTS WITH WRITING TECHNOLOGY

When, during the sixth millennium BC, the use of abstract symbols and signs in the Vinča region virtually began to explode, this was not a sudden leap of the human mind into a hitherto unknown dimension. Rather, this phenomenon represents the intensification of a process of experimenting with symbol-making that had developed over millennia.

In South-eastern Europe, sign use reached a higher organizational level than elsewhere, and eventually developed into systemized forms of notation and an archaic form of writing (see *Haarmann 2005* for an analysis of the Danube script and its organizational principles). The notational systems of Neolithic cultures in South-eastern Europe are among the markers of high culture, and contributed decisively to the



Map 3. The central area of the 'Danube civilization' (major sites with script finds are underlined) (after* Winn 1981; Gimbutas 1991 and Haarmann 1995*).

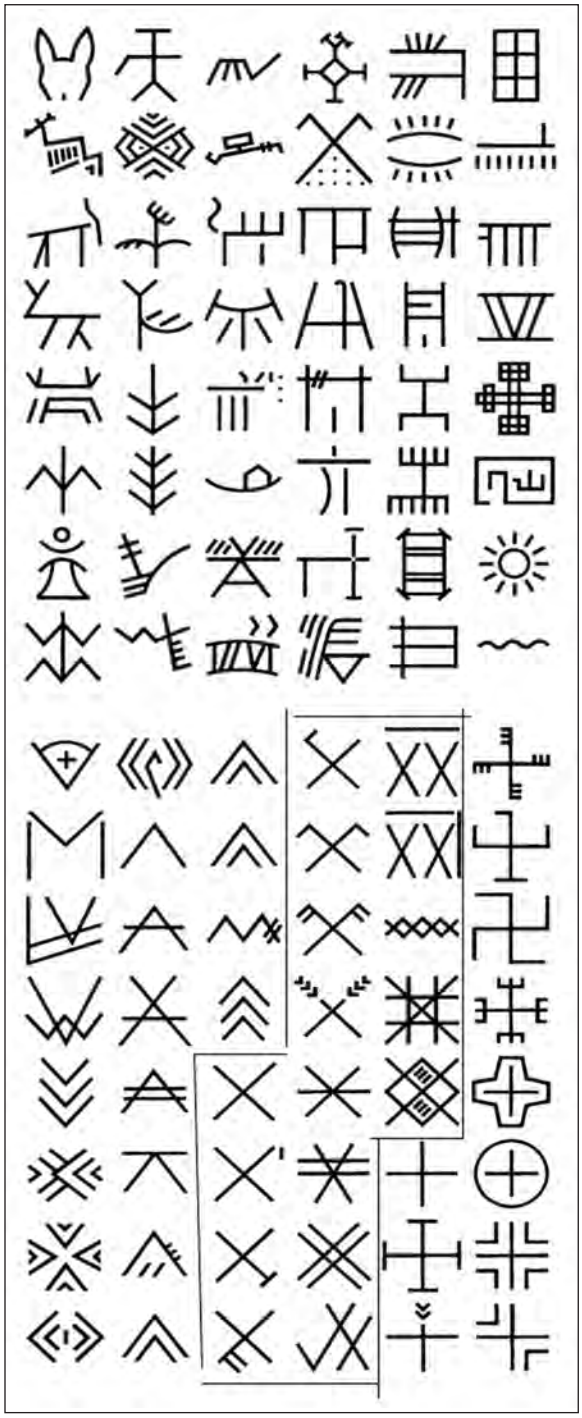


Fig. 12. Selected signs from the Danube script (after* Haarmann 1995.Fig. 32*).

formation of the Danube civilization which flourished from c. 5500 to c. 3500 BC. Writing may not have originated in the region centred around Vinča (south of Belgrade), with its pivotal role connecting trade routes along the Danube and its tributaries, but the cultural complex of Vinča played a significant role for the spread of literacy. Inscribed objects have been found at more than a hundred places throughout Southeastern Europe (Map 3).

Fig. 13. The system of Indus signs (after* Parpola 1996.167*).

"The Vinča culture was certainly the most developed, the longest lasting and, territorially, the largest culture in the Balkans and Southeastern Europe. A whole series of regional groups in the area are genetically and culturally linked to it: Karanovo II–IV in Thrace, Paradimi on the northern Aegean shore, probably a part of the Cretan Neolithic, the Larissa group in Thessaly..." (*Garašanin 1998.65*).

A multitude of individual signs have been identified in the cultural strata of the Danube civilization. Their number exceeds 1000 in the Vinča region alone (*Starović 2004.8*). Iconicity and abstraction are both clearly recognizable in the repertory of signs and symbols, with abstract signs forming the majority. In the realm of iconic signs of the Danube script, the following subcategories have been distinguished (*Haarmann 1995.32 ff*):

- animals
- human beings and parts of the body
- plants
- tools, utensils or implements with different functions
- structures with different functions
- natural phenomena
- (stylized pictures with possible naturalistic origin).

Among the abstract motifs, we find basic forms such as the circle, the square, the triangle, different hatches, strokes and dots. The inventories of all ancient writing systems in the Old World are composed of two categories of signs, of iconic and abstract signs:

- The iconic signs are motivated, and the natural objects which are depicted can be recognized and identified (e.g. the depiction of a tree). It depends on the degree of stylization whether the recognition of natural objects in signs of ancient scripts is easy or problematic.

- The abstract signs are arbitrary, and lack any recognizable visual association with natural objects. The associated meaning of abstract signs has to be learned, because it is not evident in the visual representation (e.g. the meaning of a cross sign).

No ancient writing system operates only with iconic signs, and no writing system operates only with abstract symbols. In all sign inventories, both categories of signs are integrated. Each sign inventory singles itself out by the proportion of iconic and abstract signs which serve to render information. In certain inventories, there is an abundance of iconic signs, which outnumber abstract signs, as in Egyptian hieroglyphs (*Davies 1987*) and early Chinese writing of the Shang period (*Boltz 1994*). The inventory of the Danube script abounds in abstract signs and geometric motifs (Fig. 12).

A dominance of abstract signs is also characteristic of other ancient writing systems. This is true of ancient Sumerian pictography, which predates cuneiform (*Green and Nissen 1987.169 ff*), and of the ancient Indus script (*Parpola 1994.70 ff*). The proportions of the two sign categories in the Danube script and the Indus script are very similar (Figs. 12 and 13).

Other similarities between the two systems include techniques to produce variants from basic signs by

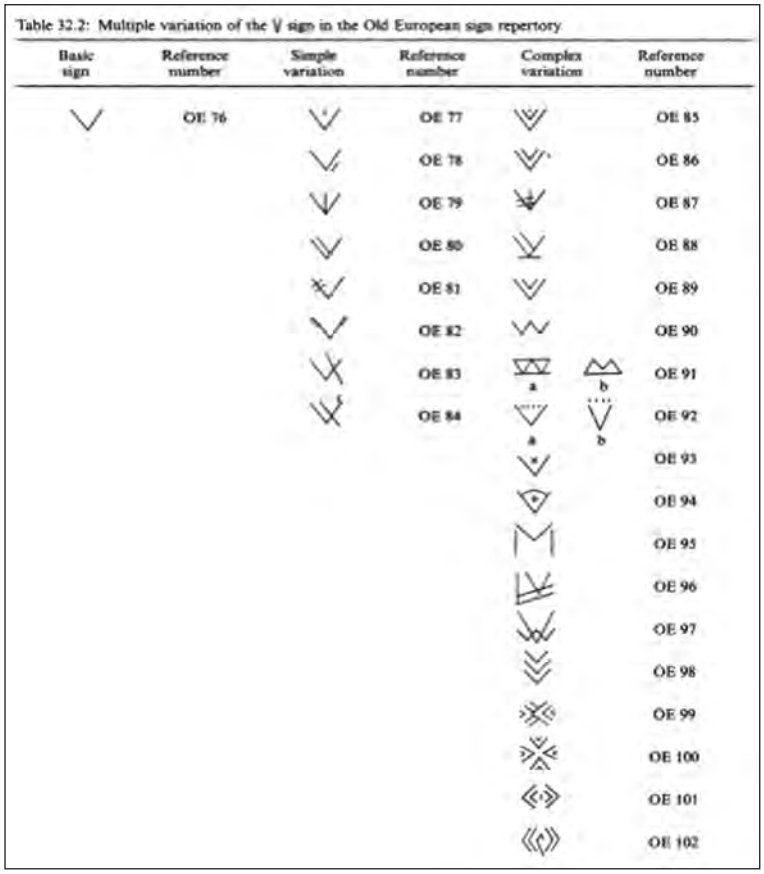


Fig. 14. The V sign and its variants in the Danube script (OE = Old European; numbering after* Haarmann 1995.Fig. 32*).

means of auxiliary signs such as dots and strokes or other components. The motif of the cross is found, as a basic sign and as a basic element in derivations, in the Danube script and in the Indus script (see the marked sections in Figs. 12 and 13). When inspecting the sign inventories of ancient writing systems, one recognizes the working of the principle of cultural relativity, not only in the domain of iconic signs, but also in the composition of the abstract inventory. For example, among the abstract signs of the Danube script, the V sign and its derivatives are prominent (Fig. 14). In a comparative view, it is surprising to learn that the V sign is absent from the inventory of the Indus script. Other items of contrast are the meander and spiral motifs, both well known from the Danube script, but absent from the Indus script.

All ancient writing systems are composed of hundreds of signs. The reason for the high number of signs is the logographic principle of writing, which demands individual signs for writing individual concepts or ideas. The concepts which dominate daily communication easily amount to several hundreds, and including special terms in professional fields, the number further increases to several thousands. In the Danube script, more than 1000 signs were used with conventional values (meanings). Ancient Sumerian pictography (of the Uruk III and IV periods) operated with about 770 signs; from the collection of oracle bone inscriptions from ancient China, some 1200 to 1400 signs are known. The Proto-Elamite script is characterized as "using less than 1000 individual signs and thus in the range of logo- or ideographic writing systems" (*Englund 1996.161 f*). Even in Egyptian writing, where there is a stable set of phonographic signs, the majority of signs were used in ideographic functions. Ancient Egyptian writing applied between 700 and 1000 hieroglyphic signs (*Hannig 1995*).

NOTATIONAL SYSTEMS IN NEOLITHIC EUROPE

Marshack (*1972; 1990*) has made a strong case for the assumption that the people who painted the Palaeoli-

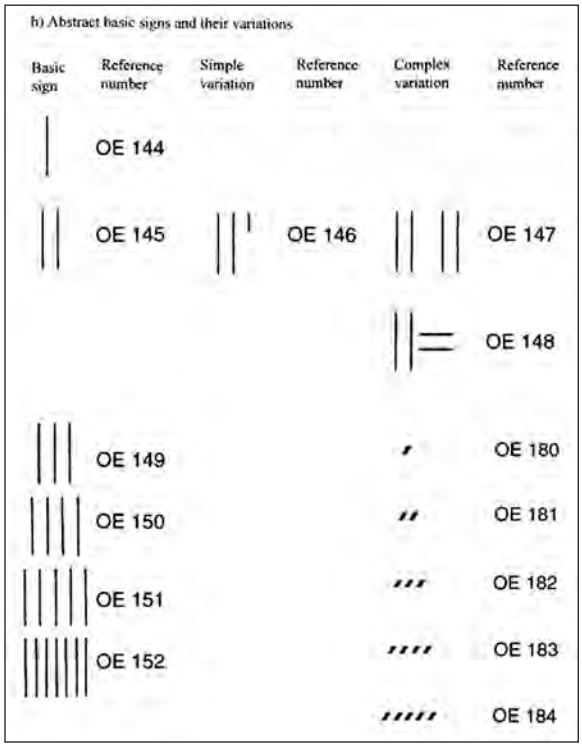


Fig. 15. Dots and strokes in the inventory of Danube signs (after* Haarmann 1998.76*).

thic caves in Southwestern Europe knew some kind of calendrical notation. The abstract signs found on antlers and other bone artefacts seem to represent intentional markings of lunar phases and seasonal changes.

The revolution that symbolic activity experienced with the emergence of notational systems in the Neolithic in Southeastern Europe was, however, unprecedented. In the Vinča area, sign use not only reveals the typological features and organizational infrastructure of a writing system, but also of one or even more notational systems with functions other than writing. Among the inscribed objects found at sites of the Danube civilization there were weights with incisions. What may well belong to a system of numerical notation are the dots and strokes which appear singly or in groups (Fig. 15).

The existence of numerical notation (and possibly also of calendrical notation) in the cultural horizon of the Danubian civilization is more than probable (see *Haarmann 2005* for further details). Observations about numerical notation have been reinforced by the discovery of "celestial symbolism" in the Vučedol culture (*Durman 2001*) which, in view of its heritage, can be considered to be the last offshoot of the Danubian civilization.

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