Discussion and Criticism[1]

On Vision and Power in the Neolithic: Evidence from the Decorated Monuments[2]

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Nearly 20 years ago Eichmeier and Höfer (1974:151–60) argued that the "abstract" motifs of megalithic art derived from the luminous, geometric entoptic phenomena (sometimes called "form constants" and "phosphenes") seen in certain altered states of consciousness. Their survey of diverse arts, however, gave the impression that almost any geometric motif could be declared entoptic in origin. More recently, Bradley (CA 30:68–75) has used our neuropsychological model (CA 29:201–46) to highlight a persuasive set of formal correspondences between entoptic phenomena and megalithic art motifs. Following Bradley, Patton (CA 31:554–58) has developed a diachronic perspective with particular reference to the megalithic monuments of southern Brittany.

Acceptance of these arguments has been somewhat tentative (e.g., Sherratt 1990), and their implications have not been sufficiently explored. We therefore introduce this extension of the debate by suggesting two ways of strengthening Eichmeier and Höfer's and Bradley's case. First, we briefly place the formal parallels they note in the broader context of the neuropsychological model and show that these parallels are part of an analogical argument based on strong relations of relevance. We then consider the implications of this argument for understanding the political role of megalithic art and for evaluating continuities and discontinuities that seem to imply political contact or independence. Hallucinatory experiences of the "supernatural" clarify important points made in recent discussions (e.g., Thomas 1990, 1991; Barrett 1990) about the political role of the monuments and how they structured social dominance. Altered states of consciousness can become a site of struggle. Social groups define altered mental states to their own advantage and, hence, differently in different historical circumstances. Moreover, competing definitions may exist in any given circumstance. Those who manage to define and control altered states of consciousness through their "priestly" or other functions control access to supernatural power, arcane knowledge, and divine legitimacy. Part of the struggle is to make their constructed, historically situated definitions and controls appear immutable.

THE NEUROPSYCHOLOGICAL MODEL

There are compelling reasons for turning to neuropsychology to explain some aspects of megalithic art. Mental imagery, in a broad sense, is intrinsic to the human nervous system, not a rare or necessarily pathological aberration (e.g., Doob 1972, Ernest 1977; see Asaad and Shapiro 1986 for a more recent review). Therefore there is reason to believe that it may have been experienced in all periods of history and in all places. Bourguignon (1968, 1973) found that as many as 437 of the 488 societies she surveyed had some form of institutionalised altered states of consciousness. Her sample ranged from foragers to more complex societies. There are therefore *a priori* grounds for suspecting some form of institutionalised altered states during the Neolithic.

More specifically, Sherratt (1991:51) argues for "an extensive knowledge of the various mood-altering substances which occur in the natural flora" during the Neolithic. Having reviewed the palaeobotanical evidence for psychotropic substances and the ceramic evidence for smoke inhalation, he asks (p. 54),

> Is it a coincidence that the appearance of the apparatus [geometrically decorated ceramic stands and bowl-like containers, some of which carry traces of burning] of a southern cult should occur in northern France at the same time as Breton megalithic art reached its climax in the complex forms of the Gavrinis carvings, recently interpreted as entoptic images produced under the influence of drugs (Bradley 1989; Sherratt 1990:163)?

Sherratt (1991:52) sums up the importance of mood-altering substances by saying, "Any account of prehistoric Europe which omits a consideration of such substances is likely to be incomplete." He also notes that the effects of a comparatively mild stimulant can be enhanced by fasting or breathing control. Even profound altered states of consciousness and their attendant hallucinations can, of course, be induced without psychotropic drugs; other inducing conditions include

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rhythmic driving, audiodriving, hyperventilation, pain, sensory deprivation, and meditation.

In search of the greater completeness that Sherratt advocates, we look more closely at the neuropsychological evidence (see also Dronfield n.d.). The neuropsychological model comprises, in the first instance, three stages of visual imagery. The geometric entoptic phenomena that Eichmeier and Höfer and Bradley compare with the motifs of megalithic art are especially characteristic of the first stage (e.g., Klüver 1942, Siegel 1977). In stage 2 subjects try to make sense of these images by construing them as objects important to them (Horowitz 1964:514; 1975:177, 178, 181). Stage 3 mental imagery is more culturally controlled: it comprises animals, people, monsters, and a variety of bizarre experiences as well as entoptic elements that now tend to be peripheral or combined with iconic imagery (Siegel 1977:132; Horowitz 1975:178; Siegel and Jarvik 1975:127, 143). When we applied this model to Upper Palaeolithic art, we demonstrated correspondences between all three of its stages and the painted and engraved imagery (CA 29:201–46). Because megalithic art has far fewer iconic depictions than Upper Paleolithic art, research on it is largely but not entirely restricted to stage 1. Moreover, when the motifs are all very simple and limited in morphology (e.g., Bradley 1991*a* on cup marks and cup-and-ring motifs), it is impossible to make a convincing case for entoptic origins. It is better to exclude these very simple motif assemblages until the more persuasive motifs have been studied or until other evidence suggests that the motifs may have been associated with altered states of consciousness.

The comparison of entoptic forms and megalithic art motifs of figure 1 goes beyond our original discussion and Bradley's demonstration that certain stage 1 entoptic elements are very similar to generally more complex Neolithic motifs by emphasising the crucial and formative role of culturally determined expectations. When assessing these similarities, it is important to note that the elements established under laboratory conditions are not actual entoptic phenomena; rather, they represent the ways in which Western subjects perceive them and then, with pencil and paper, record their perceptions. The subjects' familiarity with geometry and a wide range of geometric forms together with the "clinical" rather than emotional ambience of laboratory work make for greater simplicity and regularity than we should expect to find in art produced in more highly charged circumstances. Moreover, figure 1 does not imply equal representation of the motifs in laboratory research and in megalithic art or the presence of these motifs in the same proportions in all regions of Western Europe. Cultural predilections govern which entoptic elements are selected for depiction and in what proportions. We are concerned, in this initial comparison, simply with their presence. The formal parallels are striking, despite the cultural distance between laboratory and megalithic times.

The neuropsychological model, however, provides further criteria for assessing arts comprising only, or virtually only, geometric motifs. These are transformational principles that alter the basic elements of all three stages in often complex ways. In each of the two instances we give, we exemplify the principle by referring to laboratory research and to two arts known ethnographically to depict the imagery of altered states of consciousness, the bark and house paintings of the Amazonian Tukano (e.g., Reichel-Dolmatoff 1969, 1978) and southern African rock art (e.g., Lewis-Williams 1981*a*, 1982, 1990; Lewis-Williams and Dowson 1989).

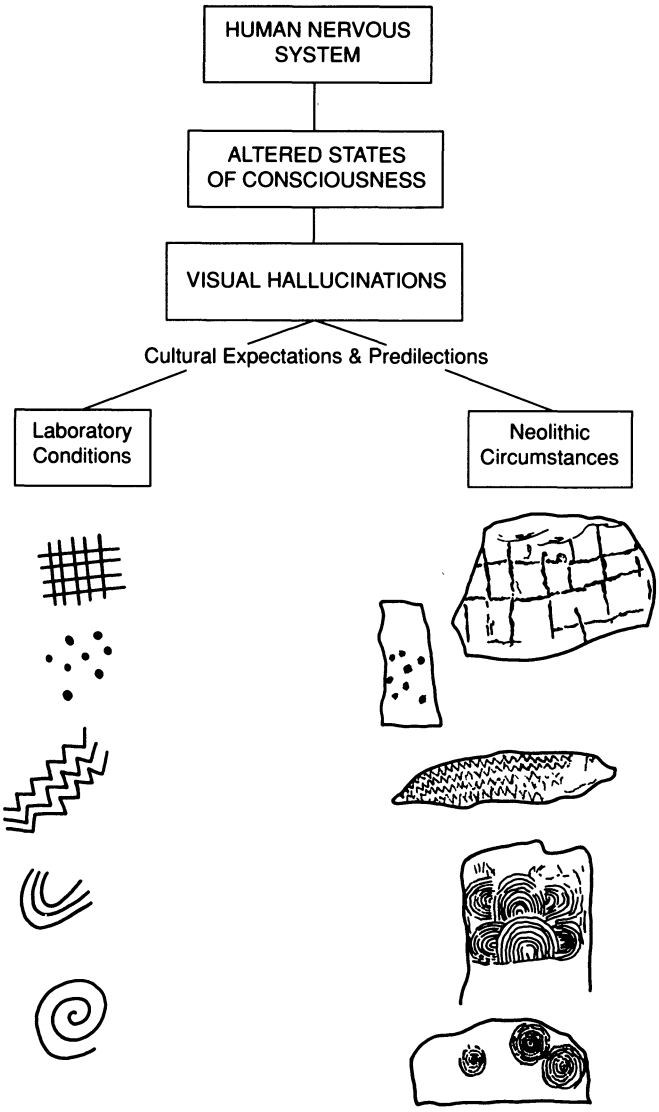

FIG. 1. *Entoptic forms depicted under laboratory conditions (after Siegel 1977:138) and in Neolithic art (after Shee Twohig 1981: figs. 162, 161, 247, 110, 216).*

We attend first to *polyopia*, the transformational principle whereby a single mental image in any of the three stages of altered consciousness may turn into a series of repeated images, rather like the infinite reflections produced by parallel mirrors (Klüver 1942:177, 182, 187; Siegel 1977:134). A laboratory subject experienced stage

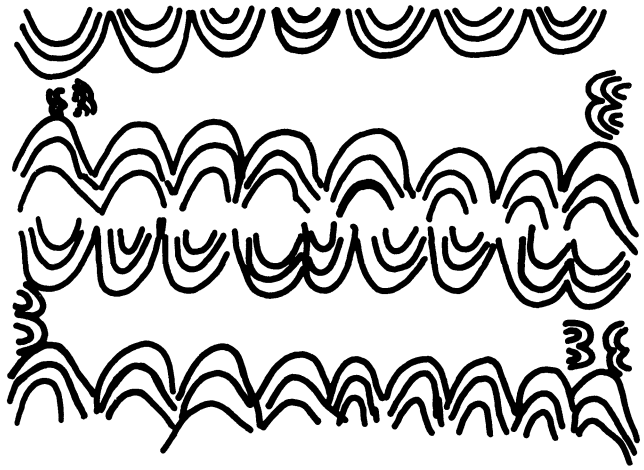

FIG. 2. *Part of a drawing made by a Tukanoan and said by him to represent "yajé flowers" (after Reichel-Dolmatoff 1978:pl. 36).*

FIG. 4. *Engraved elaborated entoptic design, Cape Province, South Africa.*

3 iconic polyopia like this: "One toy soldier is duplicating and becoming a whole army of toy soldiers" (Siegel and Jarvik 1975:114). Reichel-Dolmatoff (1972:91–92), who ingested *yajé* (*Banisteriopsis caapi*) during a Tukano ritual, describes how this experience operates on stage 1 entoptic elements: "A circle appears, it doubles, it triples, it multiplies itself." Moreover, he found that Tukanoans, asked to draw their mental imagery, tended to fill the pieces of paper he gave them with rows of formalised and reduplicated geometric motifs comparable with their painting of the same motifs on the walls of their houses (figs. 2 and 3). The Tukano identified these reduplicated forms as images derived from what *they themselves* recognised as the first stage of their trance experiences; there can be little doubt of their entoptic origin (Reichel-Dolmatoff 1969; 1978:12–13). Comparable formalised, repetitive paterns are found in the shamanistic rock art of southern Africa (fig. 4; see also Tyagi 1988 on Indian rock art).

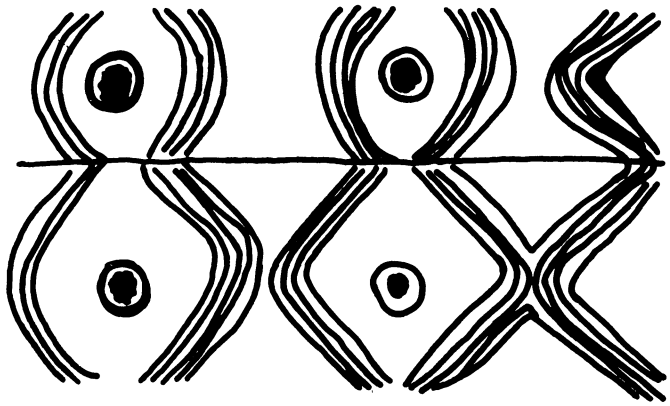

FIG. 3. *Part of a drawing made by a Tukanoan and said to represent "luminous patterns perceived after one or two cups of* yajé*" (after Reichel-Dolmatoff 1978:pl. 23).*

Comparison of laboratory reports, together with Tukano and southern African reduplicated entoptic imagery, with megalithic art is compelling. While some megalithic panels comprise a range of different geometric forms, such as spirals, zigzags, and "diamond chains," others, such as uprights at Gavrinis (fig. 5), lintels at Fournocks (Shee Twohig 1981:fig. 247B), and the entrance stone at Newgrange (Shee Twohig 1981:figs. 20, 2), repeat a single entoptic element. We argue that polyopia explains these tightly packed, repetitive motifs; megalithic "artists" were depicting one of the ways in which they experienced the mental imagery of altered consciousness.

Another transformational principle is integration. In stage 1, different entoptic images become integrated to form more complex geometric hallucinations (Klüver 1942:177; Siegel 1977:134). This principle explains the origin of Tukano barkcloth paintings of trance imagery that show curvilinear forms outlined by or in other ways associated with dots (fig. 6). Similar integrations are found in southern African shamanistic art, where meandering red lines are outlined with white dots; similar forms are also found among rock engravings (fig. 7; Lewis-Williams 1981*b*, Dowson 1989). We suggest that integration also explains the complex megalithic imagery painted at Pedra Coberta, where red zigzags are outlined with small black dots (fig. 8).

A different type of integration is experienced in stage 3, when iconic hallucinations of people, animals, and objects fuse with or are surrounded by geometric elements. In a stage 3 hallucination a laboratory subject reported seeing "pulsating stars outlining the shape of a

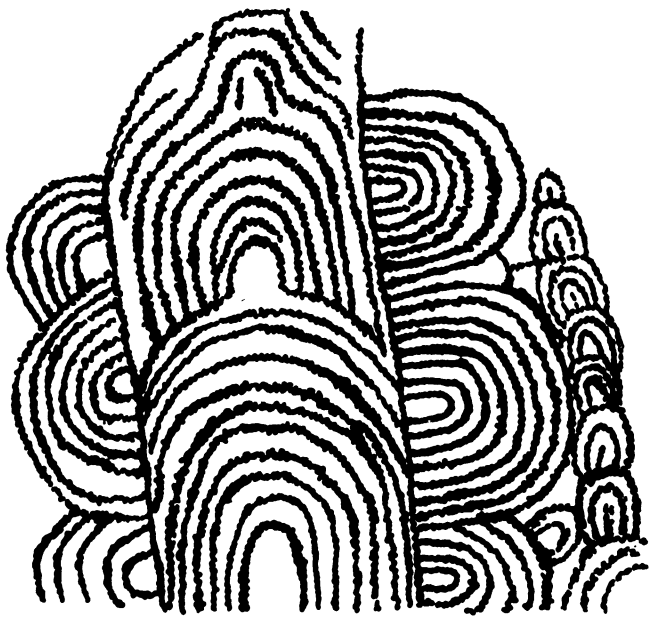

FIG. 5. *Designs on an upright stone in the passage of Gavrinis (after McMann 1980:figs. 65–67).*

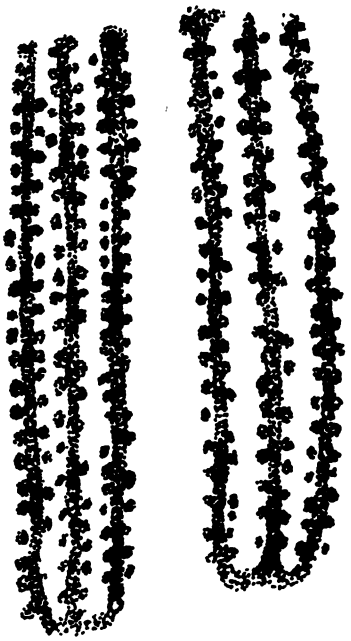

FIG. 7. *Southern African rock engraving, northern Cape.*

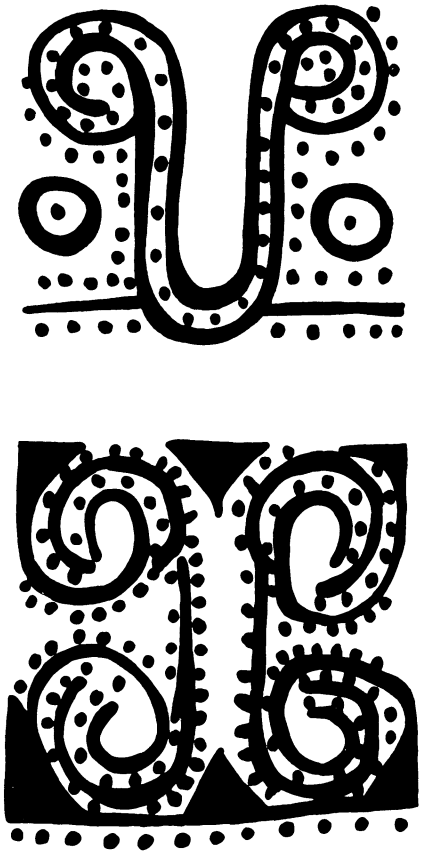

FIG. 6. *Tukano drawings of mental imagery on barkcloth (after Reichel-Dolmatoff 1978:pls. K–M).*

dog overlaying a spiral-tunnel of lights" (Siegel and Jarvik 1975:132). This sort of experience is depicted in Tukano drawings of hallucinations in which the referents of the iconic images are sometimes not immediately obvious because they are actually entoptic elements that have been given generally accepted identities, such as the gourd-rattles, trumpets, and flutes used in *yajé* rituals (e.g., Reichel-Dolmatoff 1978:29–34 and pls. 10 and 16). In other instances the "real" elements depict genuine stage 3 hallucinations of such things as canoes and people involved in mythical events (Reichel-Dolmatoff 1978:pl. 10). In southern African rock engravings, people and animals are often associated with geometric motifs (e.g., Lewis-Williams 1988:figs. 3–10; Lewis-Williams and Dowson 1989:figs. 29, 35a, 39b, 42, 43, 48b, 78, 87a; Dowson 1992:50–65). Comparable integrations of "naturalistic" images and entoptic elements occur in megalithic art. At Gavrinis, a bow, arrows, and axes are embedded in nested catenary curves, spirals, and curving lines (Bradley, CA 30:fig. 5). Among these depictions is a distinctive form of axe often made from exotic raw materials. The large numbers of these axes that have been found in burial mounds around the Gulf of Morbi-

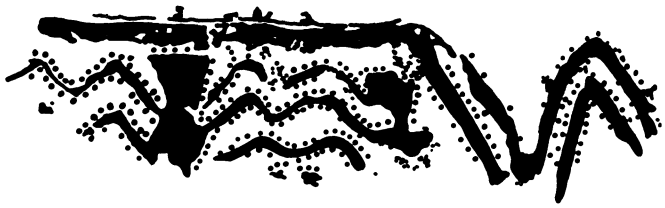

FIG. 8. *Painted megalithic motif from Pedra Coberta (redrawn from Shee Twohig 1981:fig. 18).*

han have led Bradley (CA 30:72; cf. Patton, CA 31:556) to propose a "powerful symbolic link" between the carvings and the artefacts in the burial mounds. We argue that this is another instance in which items with strong emotional content are caught up in entoptic imagery.

The fact that megalithic "artists" focused on polyopia and integration rather than another kind of transformation (e.g., fragmentation of mental imagery [Lewis-Williams and Dowson, CA 29:203, 208]) was, like their selection of a specific range of entoptic forms, socially determined. Artists choose which components of their mental imagery they will depict and how they will formalise them. The reduplication of some carved motifs on megalithic tombs and the integration of other geometric or iconic images was therefore culturally determined and meaningful in ways that we do not at present understand. Nevertheless, the case for supposing many of the megalithic geometric motifs to have originated in entoptic visions rests on more than just the presence of entoptic formal categories and is therefore stronger than previous writers have suggested.

The way in which the multiple parallels between entoptic elements and megalithic motifs are built into a larger argument is crucial (see Lewis-Williams 1991). Briefly, we begin with a causal relationship between two properties: when people enter certain altered states of consciousness they experience specific stages and kinds of mental imagery because the progression and some of the images are embedded in the human nervous system. This strong link between two properties (altered states of consciousness and specific, definable mental imagery) constitutes the relation of relevance that is essential to a persuasive analogical argument (cf. Salmon 1982:62–63; Wylie 1985, 1988; Copi 1968:389–400). Next we show that the motifs of megalithic art are similar in *a number of respects* to types of mental imagery. As we have argued, this similarity depends not only on formal parallels but also on neuropsychological principles (Lewis-Williams and Dowson, CA 29:217–32). Finally, we infer, on the confident assumption that the same relation of relevance existed in the Neolithic, that Neolithic people who entered trance (as some must surely have done) would have seen the same entoptic forms, though mediated by cultural expectations, as modern laboratory subjects; that they would have construed them according to culturally constructed expectations; that they would have experienced integrations of entoptic and iconic imagery; and that their percepts would have reduplicated. The implication of this set of common features is, therefore, that some Neolithic people experienced altered states of consciousness and that they depicted their culturally "processed" mental imagery on the monuments. We do not argue that *all* Neolithic motifs derived from altered states of consciousness, only that some derived from mental imagery and that these became part of a complex system of representation.

POLITICAL ROLE

This inference brings us to what we see as the central question: Why did Neolithic people carve these motifs on the chambered tombs? In approaching this problem, we draw a rather rough-and-ready analytical distinction between origin, meaning, and function. So far we have commented on the *origin* of some megalithic geometric motifs in the entoptic imagery of altered states of consciousness. The *meanings* that Neolithic people attached to specific forms will be much more difficult to determine (cf. Bradley 1991*a*:80): each society gives the forms its own, often arcane and changing, meanings (cf. Reichel-Dolmatoff 1978 on the Tukano, Dowson 1989 on the San). The *function* of the art may be more within our grasp at the moment. Bradley and Chapman (1986:136; cf. Shanks and Tilley 1982, Renfrew 1973) and other writers argue that there was a close link between ritual and political power in the Neolithic, and Hodder (1984:64) argues that the tombs were associated with increasing control over a lineage by elders or subgroups. With Bradley (CA 30:68–75), he believes the tombs to have been associated with an elite, but he does not consider the role of the "supernatural" in ideology and representation. We argue, in contrast, that the exploration of mental imagery by an exclusive group can generate the symbols and metaphors of a dominant ideology.

Appropriating the material means of production entails appropriating what Marx and Engels (1942:39) call the "mental means of production" as well. Altered states of consciousness are an often-ignored part of the mental means of production, but they can assume political importance in a variety of circumstances (see, e.g., Lewis 1971, Stephen 1979, Hayden 1987). For instance, in situations in which hallucinatory experiences are fairly common, an emerging elite may try to seize control of these as an adjunct to its ideological armoury. In megalithic times the imposing tombs were probably implicated in an ideology that justified and negotiated an elite's growing control of resources, labour, and the fruits of that labour. The presence of entoptic motifs on the tombs and, possibly, on Grooved Ware (Bradley, CA 30:68–75) suggests that this ideology was validated by the trance experiences of the dominant group or its specialised representatives. It was they who produced symbols that presented exploitative material relationships as eternal and immutable, symbols that included entoptic forms.

Showing how such a link between ritual and power developed, Bradley (CA 30:70–71) points out that the earliest phase of Breton art "was dominated by symbols peculiarly appropriate to the new mode of production" (e.g., axes, ploughs, bovids, and shepherds' crooks). Later these motifs were surrounded by a "far wider array of entoptic phenomena" that were bigger and bolder. We argue that this historical progression resulted from the emerging elite's appropriation of altered states of consciousness. At one, fairly general, level, it could be argued that, as the elite's power over the actual users of the axes and ploughs increased, depictions of those instruments were overwhelmed and encapsulated by esoteric motifs. More specifically, and noting Patton's (1991) persuasive analysis, we may see the axe as a sym-

bol linking reproduction (certain contexts suggest phallic associations), production (the axe was preeminently the tool for clearing land), and the ancestors (it was deposited and depicted in funerary contexts). Patton postulates rituals marking bridewealth exchanges that were associated with axe production and exchange and that led to the creation and perpetuation of elite lineages. The placing of axe motifs within convoluted matrices of entoptic forms therefore probably points to the important role of altered states of consciousness in linking elite lineages—their production and reproduction—to the ancestral past.

An initial explanation for this "concealment" of iconic motifs within convoluted entoptic imagery may be that the makers of the art were simply reproducing the way in which the iconic imagery of stage 3 is sometimes surrounded by entoptic phenomena. But artists do not automatically produce facsimiles of their visions: they select and modify them meaningfully. Because a certain amount of skill is required to discern the iconic elements embedded in the parallel curving lines, nested arcs, and spirals, a more penetrating explanation may be that these carvings point to the generation of arcane knowledge to mark and reproduce social distinctions. The carvings may have been a cryptographic "text" the correct exegesis of which was controlled by the elite and taught to selected novices, whose own growing command of trance experience provided hallucinatory and deeply emotional guarantees of the truths they were learning.

The possession and display of the imagery of hallucinatory religious experience probably had to do with the political implications of access to the spiritual world. The act of placing a body in a chambered tomb recalls laboratory subjects' reports on mental imagery's being related to a tunnel-like perspective. They speak of seeing a bright light in the centre of their field of vision that becomes the focus of this tunnel. One subject puts it like this: "Images tended to pulsate, moving toward the centre of the tunnel or away from the bright light and sometimes moving in both directions" (Siegel 1977:134). As subjects move deeper into trance, the rotating tunnel seems to surround them, and there is a progressive exclusion of perceptual information (Horowitz 1975:178). The sides of this vortex may be marked by a lattice of squares like television screens; the images on these "screens" are the first spontaneously produced stage 3 hallucinations (Siegel and Jarvik 1975:127, 153; Siegel 1977:136). The parallels between this experience and looking along a chambered tomb when there is a light in the distance are close. When new human remains were placed in a tomb, they and those who bore them were entering a human-made replica of the spiritual, or hallucinatory, world, with its darkness, engulfing vortex, and mental imagery. The geometric motifs and the tombs themselves may well have been designed, in part, to recreate the tunnel experience, and physical entry into the dark passages may have been seen as parallel, perhaps even equivalent, to psychic entry into the spirit world via the mediating vortex. In this way, the placing of a body in a tomb dramatised the elite's more direct—if not exclusive—access to the spiritual realm.

The construction of the tombs was thus undertaken to "orchestrate the encounter with the ancestral remains" (Thomas 1990:175) in such a way as to define, reproduce, and manipulate asymmetrical power relations among the living. To explicate this "orchestration," we postulate a broad and frankly hypothetical schema that is homologous with the structure of the passage tombs (cf. Thomas 1990). Inevitably, our schema blurs regional differences that in a more detailed account would have to be recognised and interpreted.

First, there were the ordinary people, the bulk of the population, who viewed the tomb from afar, to whom altered states of consciousness were "officially" denied, and who knew that they would be buried elsewhere and thus separated from the elite in death as in life. The commanding of their labour to build the tombs and to modify them from time to time was designed to reproduce their subjugation, but in fact it more probably led to divisions among them: some people probably participated willingly, accepting the promises of the elite; others probably realised that they were being exploited. When, in the nature of things, some of them did experience altered states, they may well have regarded their own experiences as competitive with those they knew were being experienced in the distant tomb. For them, ecstatic states may have been subversive and associated with a different conception of society. The elite may have defined the rest's ecstasy as madness and thus marginalised it.

Secondly, there was a small group, drawn from a dominant lineage, that entered the forecourt. Members of this group passed some of the carvings, but, because they were allowed no farther, the arcane images beyond the forecourt were forbidding and signified exclusion from the ultimate experience while proclaiming their association on a broader level. Without experiencing the visions, these persons may nevertheless have experienced the euphoria—a much "lighter" altered state of consciousness—of those who participate at a distance in intense religious rituals.

Finally, there was a select group that entered the deep chambers and a deep altered state of consciousness that took them and them alone into the realm of the ancestors, the imagined centre and source of power. They were party to the esoteric significance of the carvings; to them the motifs spoke of their own inclusion and the exclusion of others—after all, they were the ones who were orchestrating the whole ritual. In some tombs the presence of entoptic motifs at locations marking divisions between different spaces, such as portals, doorways, and kerbstones (Thomas 1990:175), suggests that altered states of consciousness were intimately associated with crossing those liminal zones. Indeed, there is a need to examine in detail the placing of motifs within the architecture of the tombs (e.g., Eogan 1986), the development of "styles" within specific sites, and the reuse of decorated stones (e.g., O'Sullivan 1986, 1989) in

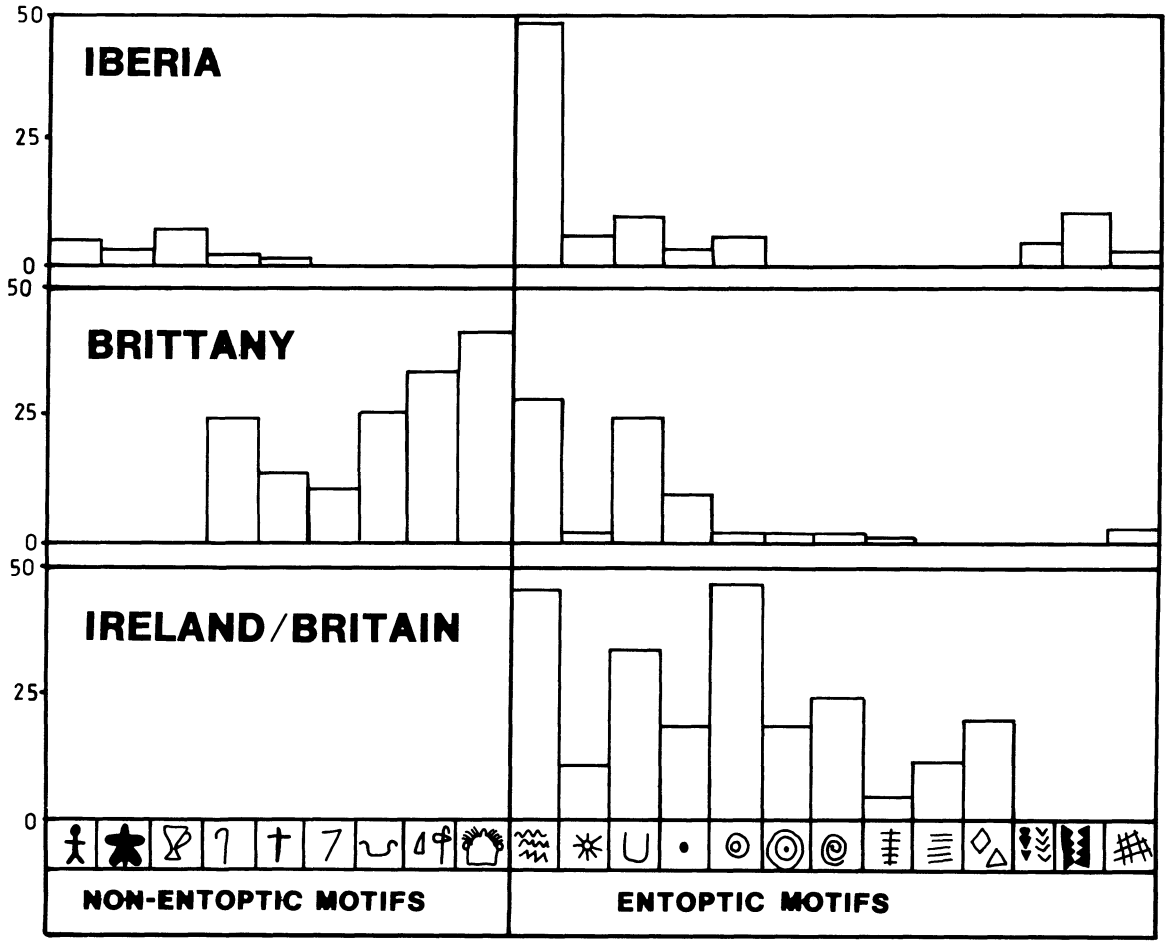

FIG. 9. *The geographical distribution of entoptic and non-entoptic motifs in megalithic art (motifs from Shee Twohig [1981:13] regrouped according to whether they exhibit formal parallels with entoptic phenomena or not).*

the light of their possible association with specific components of altered states of consciousness.

The neuropsychological approach thus complements sociological accounts of the political role of megalithic tombs by identifying types of "spiritual" experience and showing how this experience and its imagery may have been manipulated and keyed into the structure of the tombs to reproduce social and economic domination.

CONTINUITIES AND DISCONTINUITIES

The entoptic origin of some megalithic motifs raises questions about the political and economic inferences that can be drawn from the presence or absence of motifs in arts made in different places and at different times. Bradley (CA 30:68–75), for instance, notes the occurrence of similar motifs in Britanny and Ireland and takes it as evidence for contact. In a more detailed study of the distribution of Neolithic art across the British Isles, he writes that the "prototypes" of art and pottery motifs are in Ireland (Bradley 1991*a*:80). Similarly, Shee Twohig (1981:136–137; see also Bradley and Chapman 1986) argues that the presence of the axe, buckler, and yoke motifs in Breton passage-grave art between 3700 and 3000 B.C. and their total absence from Iberian and Irish/British art suggest isolation, while a range of shared motifs in the period 3000–2500 B.C. suggests contacts.

Without wishing to pass judgement on specific hypothesised contacts in Neolithic Europe, we point out that the use of certain motifs in this way is problematic. A distinction should be drawn between motifs that may be entoptic in origin and those that are not. When this distinction is used to reorganise Shee Twohig's (1981:fig. 13) diagram showing the distribution of passage-grave art motifs in Iberia, Brittany, and Ireland/Britain, it becomes clear that the shared motifs are principally entoptic in form and that non-entoptic motifs tend to be more restricted in their distribution (fig. 9). It can therefore be argued that certain motifs are common not because of contact between the three regions but because they are inherent in the human nervous system. Neuropsychological experiences were thus implicated in the sharing

of more general arcane knowledge between peer elite groups. Moreover, if the people of one region discovered that those of another were already experiencing or had the capacity to experience some of their own entoptic symbols, interaction on the ritual level as well as on the economic would have been facilitated. The commonality of mental imagery may thus have facilitated the recognition and consolidation of the links between polities that Bradley and Chapman (1986) and others describe. At the same time, the culturally specific ways in which entoptic motifs become standardized and elaborated often make it possible to distinguish regional variants of the basic forms. As Shee Twohig (1981:136) remarks, "The styles of art in each region are quite different. Almost without exception a stone taken out of context could be placed in its correct group without any difficulty." These stylistic differences may suggest that links between polities did not destroy independence.

Along with these geographical continuities, the virtually universal occurrence of altered states of consciousness also suggests temporal continuities. Discussing the relationship between the Neolithic and the Upper Palaeolithic, Hodder (1984:66; 1990) notes that megalithic tombs and art are confined to western Europe, the region in which painted and engraved Upper Palaeolithic caves are found. In central Europe, similar caves have no parietal art, nor are there any megalithic tombs. These points lead him to speculate on the possibility of identifying "long term cultural traditions which are actively implicated in social change." The neuropsychological approach enables us to offer some preliminary observations on these continuities and changes.

We have already noted ways in which the decorated passage graves replicate the vortex that leads to deep trance. The same is true of many Upper Palaeolithic caves: entry into the dark tunnels with their encompassing imagery on the walls, ceilings, and, sometimes, floors parallels entry into an altered state of consciousness. To these structural similarities between the tombs and the caves we add shared conditions which induce altered states of consciousness: darkness, isolation, cold, and silence. Both the tombs (cf. Bradley, CA 30:71) and the caves could therefore have not only reproduced but also induced trance experience in similar ways.

The differences between Upper Paleolithic caves and Neolithic tombs are equally instructive. Access to the supernatural world of, at any rate, the later periods of the Upper Palaeolithic seems often to have been underground, via natural geological features, and as far removed from the domestic situation as possible (cf. shamanistic vision quests). In the Neolithic, the tombs were above ground, constructed by human beings, and, if Hodder (1984) is correct, represented houses, albeit "houses of the ancestors." Moreover, in the Upper Palaeolithic, approach to the spirit world was not explicitly through the dead as represented by burials: it was more probably through the personal experiences of shamans (Lewis-Williams and Dowson, CA 29:201–46). By contrast, approach to the spirit world in the Neolithic was probably through a lineage or elite group represented by the manipulated presence of human remains. In both contexts, the two worlds were mediated by trance experience; the ways in which this mediation was achieved were, of course, historically contingent. The role of altered states of consciousness in the validation, representation, reproduction, and transformation of ideology and social distinctions no doubt changed as the social formation changed and people continued to hallucinate and exploit their experiences in a variety of circumstances.

At the beginning of the Upper Palaeolithic "artists" engraved and painted their images in the entrances to caves or, at any rate, as far in as light penetrated; access to religious imagery (if not the actual experience) may have been open to all. Later, they ventured into totally dark depths, and by the Magdalenian a few people were travelling considerable distances underground in order to place their images, sometimes squeezing through narrow openings or scaling slippery chimneys to reach hidden niches (Bahn and Vertut 1988, Ucko and Rosenfeld 1967). The leaving of daylight areas to go deeper into the dark caves suggests growing interest in and insistence on spatially distinct ritual areas, a tendency that probably paralleled growing social differentiation (cf. Bender 1989). The source of increasingly esoteric religious knowledge was being placed farther and farther away from daily life: the deeper into the caverns, the more restricted the access to altered states of consciousness or, more precisely, to the altered states that were increasingly being defined as the ones that really mattered. The spectrum of altered states of consciousness, ranging from "light" euphoria to deeply hallucinatory conditions, was being divided up, defined, and socially allocated. In many instances, it seems that the more structured the social dimension, the more likely it is that the "deeper" altered states of consciousness will be regarded as dangerous (Douglas 1973:104). Certainly, it is hard to imagine that penetration of the deep Upper Palaeolithic caves could have been regarded as anything but perilous, and such an attitude towards the depths may partially explain why "dangerous" animals tend to be depicted there (Leroi-Gourhan 1968, Parkington 1969). Increasing the physical danger and discomfort further restricted access to the ultimate religious experience and the power that this experience bestowed. At the same time, that some of the small decorated *diverticules* (e.g., the Chamber of Felines in Lascaux and the chimney in Bernifal) permit very little movement suggests increasing restrictions on the ways in which ideologically defined altered states of consciousness might be experienced and a concomitant codification of beliefs concerning such states. Access to certain altered states and hence to certain kinds of knowledge was being restricted. Altered states were being appropriated, defined, and differentially allocated in attempts to reproduce and to transform relations of power.

Less can be said at present about the great diversity of the Mesolithic, though there is suggestive evidence. Some cave art was made, but the depths were abandoned in favour of open rock shelters. In addition, numerous

pieces of bone, antler, and amber from this period (Maglemose) have geometric markings, interpreted by Marshack (1991:341–66) as a continuation of Upper Palaeolithic notations. Until these pieces are studied more closely, it will be impossible to say whether they carry motifs referable to any of the stages of altered consciousness. More significant, the development of what Hodder (1990:292) calls the "domus" seems to have been associated with burials in or near domestic contexts. This association suggests that access to the realm of the dead and other preternatural entities (possibly by means of altered states of consciousness) was also being domesticated and reworked in new circumstances. Power relations were now being generated within new relations of production that, together with increased sedentism, shifted the locus of the supernatural. In other words, the supernatural was being reconstructed to incorporate cultivation and the domestication of animals; much of what had been "wild" and "out there" was brought more, though not entirely, within the human domain. In the Magdalenian, ritual space (the cave) was "given"; people adapted to it as they imposed meaning on it. In the Mesolithic (and the Neolithic), ritual space was constructed. This change may have been associated with a greater sense of human-made territories and with the locating of power in the realm of the ancestors who had established those territories (cf. Bender 1989, Hodder 1990). New productive relations and associated cosmologies thus gradually eliminated the shamans together with their subterranean rituals; new groups were bidding for and eventually controlling altered states of consciousness in new ritual arenas.

Then, during the Neolithic, an elite increasingly appropriated ecstatic religious experience. In an admittedly highly generalised progression, passage tombs and court tombs were at first parallel developments, both elaborating the simpler portal dolmens; eventually, passage tombs themselves grew more complex: "Passages became larger and more structurally differentiated from the chamber, mounds became larger, and pecked and incised decoration emerged" (Thomas 1990:170–71). Art proliferated in the larger tombs. Greater social complexity and differentiation may have gone hand in hand with the greater differentiation of ritual roles suggested by more numerous divisions of ritual space. The importance of the boundaries between divisions increased: transition from one social group to another was denied or marked by rites of passage, and the divisions of ritual space (kerbstones, portals, and doorways) were marked by entoptic motifs (Thomas 1990, Bradley 1989) which suggest that certain altered states of consciousness may have played a role in some rites of passage or may have been the exclusive property of the group that enjoyed the right to pass through the divisions.

In the Upper Palaeolithic, it was exploration of increasingly inaccessible passages and *diverticules* that paralleled social and ritual differentiation; in the Neolithic, the growing complexity of the tombs similarly placed more stringent restraints on the approach route and the ritual areas through which people passed (Thomas 1990). In the Upper Palaeolithic, the source of power was increasingly hidden in the depths of the earth; going deeper underground was a way of restricting access to supernatural potency and political power. In the Neolithic, the "hiding" of the dead, the ancestral source of power, in massive tombs, also surrounded by symbols of esoteric knowledge and experience, was similarly a result of developing social complexity and, possibly, intensifying struggle, though no doubt of a different kind from that generated during the Upper Palaeolithic.

The whole Upper Palaeolithic system was thus overtaken not just by socio-economic innovations but, more important, by conceptual changes. The depths became redundant as the locus of struggle shifted. The end of the Upper Palaeolithic may be seen as the overthrow of one cosmology and associated power system by an emerging rival system. Control of certain defined altered states of consciousness had to be wrested from the shamans and situated in another sphere, in the ancestors rather than in chthonic powers and wild animals. The domestication of animals meant the domestication of part of "the wild"; the basis of shamanic power was thus eroded as a new classificatory system and cosmology came into being. The depths as access to chthonic and animal power were redefined out of existence. As Thomas (1991) argues, the Neolithic was less a unified economic system than a way of conceiving of the universe. The Neolithic "revolution" was not so much an economic and technological revolution as a coup that was intimately bound up with changing cosmologies and the metaphors that structure the world and society.

If the appropriation of "nature" is conceptual as much as physical (Thomas 1991:181), we should consider not only "normal," rational mental processes but also those altered mental states that have to be accommodated in the scheme of things, that must be part of the "integrated conceptual and classificatory system" and its "particular set of social relations and . . . means of social reproduction." Hodder (1990:288) writes of "basic emotions, fears, and desires" being played upon to generate a social order. To these affective responses we add altered states of consciousness. Like emotions, they are always with us; moreover, they represent a "wild" experience in which anything can happen—in which culture is subverted and the most stringent restrictions on action and reaction are overthrown. All societies must deal with these feral mental states either by denying their existence or, more commonly, by defining them and allocating some to exclusive groups while rejecting others as madness. Each society tames altered states of consciousness in its own way.

The greatly simplified progression from the early Upper Palaeolithic to the Neolithic that we have outlined suggests that the functioning of the nervous system in altered states was part of the "general and continuous underlying tradition" of which Hodder (1984, 1990) writes. People harnessed altered states of consciousness in different ways and for different ideological purposes at different times, but the continuities nonetheless exercised a significant influence. These long-term continu-

ities, intimately implicated in change, may well have had parallels in other parts of the world, such as southern Africa, where rock art suggests a long tradition of altered states of consciousness, again implicated in change (Lewis-Williams 1984). As Bradley (1991*b*:217) remarks at the end of his discussion of the long reach of "ritual time" at Stonehenge, "The shifting contexts of ritual can help to highlight such developments [social change], and at times may even facilitate them by lending them the authority of the past. By denying the passage of time, people can mask the effect of revolutionary developments." Indeed, the validation of ritual and social circumstances by altered states of consciousness rather than by written scriptures allows for flexibility and innovation within a continuing tradition; sanctity is in the present, not in the distant past. Once the validity of trance experiences is accepted, these states can become a powerful force for modifying social conditions and beliefs.

CONCLUSION

Altered states of consciousness are thus in no way deterministic, and our use of neuropsychology to elucidate some of the problems posed by megalithic art cannot be seen as undervaluing the crucial importance of specific, historical social conditions; indeed, we emphasise the primacy of social conditions in giving meaning to psychological experiences. At the same time, the neuropsychological model helps to eliminate the need to think ourselves into past subjectivities simply by exercising our historical imagination. An "insider's view" can be attained, at least in part, because of the commonality of the human nervous system. In the sorts of circumstances we have discussed, this commonality facilitates a better appreciation of the feelings, visions, emotions, and spiritual experiences that Neolithic people harnessed in their attempts to attain and maintain political power.

Today it is widely accepted that material culture does not simply reflect practices but rather participates in the structuring and restructuring of those practices. We argue that, in the case of the megalithic tombs, altered states of consciousness played an important role in that recursivity. Keyed into the physical constraints that mounds, entrances, forecourts, passages, and alcoves imposed on those who, at whatever remove and from whatever perspective, related to the tombs, a range of socially defined altered states of consciousness provided a spiritual journey homologous with the series of different spaces created by the tombs. The transformation and hierarchical subdivisions of space went hand in hand with the transformation (or prohibition of transformation) of consciousness.

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On Piltdown: The French Connection Revisited

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Clermont (CA 33:587) and Thackeray (CA 33:587–89) return to the case for the involvement of Teilhard in the Piltdown *affaire,* but only Clermont has uncovered what seems like a new item of evidence.

Teilhard's mention of the Piltdown canine in his message to Boule in the jubilee volume of *L'Anthropologie* (1937) is intriguing. Yet Teilhard is hardly likely to have declared, knowingly, his future "discovery" of the Piltdown canine, thereby exposing this revered master Boule as having been at least an accessory before the event and at most a co-conspirator. I therefore agree with Clermont's suggestion that Teilhard might have forgotten the true sequence of events. A contributory factor might have been that his studies, started under Boule in October 1912, were interrupted in December 1914, when Teilhard was called up for service in the First World War, and resumed and completed from 1919 to 1922.

Clermont asks why Boule would have been so impressed by the still unreported Piltdown "discovery." A wide circle of scientists had got wind of the find before it was announced; the news had even crossed the Atlantic, and from the U.S.A. Hrdlička wrote enquiring about it. It is therefore not surprising that Boule, just across the Channel, wrote enquiring from Paris and did receive information from Woodward. After all, Boule was the doyen of French palaeoanthropologists and one of the leading figures in the world at that time. It was almost his duty to acquaint himself with each new discovery of a claimed fossil man.

Boule's visit to England in 1912 does not seem to have been primarily in connection with Piltdown, nor is there any mention of his having visited the site. Instead, when