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# Biopsychological Aspects of Chumash Rock Art

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**T**HE pictographs and petroglyphs left by various early peoples throughout the world have piqued the interest of both scholar and layman alike for many years. Often complex, occasionally colorful, and frequently aesthetically appealing, these enigmatic remnants of a vanished way of life are tantalizing in their apparent universality, for they seem to be expressing significant concepts and ideas in a form that should be readily interpretable if one but had the proper key. It is perhaps that sense of immediacy, of meaning masked and hidden just out of reach, that intrigues the viewer most, and that has made rock art the subject of an extensive body of literature both popular and scholarly.

Unfortunately, the results generally obtained from even the most diligent study of rock art have seldom been commensurate with the time and energy involved, and we are usually left with the same basic, interrelated questions: (1) what motivated the production of these works of art? (2) what—if anything—do they symbolize? (3) what is the meaning of the often striking similarities that are frequently found to exist between the rock art of widely separated geographic areas? and (4) how can questions such as these best be answered?

It should immediately be evident that a single, all-embracing solution to any of these questions probably does not—and could not—

exist. Rock art is neither a uniform nor a unitary phenomenon, and we should certainly expect the diverse factors underlying its production to be nearly as variable as the medium itself. What few ethnographic data exist suggest that rock art is generally produced in conjunction with complex ritual activities of one sort or another, even though the social contexts, behavioral goals, symbolic content, and modes of expression may differ considerably. In California, for example, there is good reason to believe that certain forms of rock art found in particular regions were created in association with such diverse things as female puberty rites, weather control, hunting magic, fertility rituals, and esoteric if unspecified shamanistic activities (Grant 1965; Heizer and Clewlow 1973). Most of the time, of course, there is a dearth of relevant cultural data, and all hypotheses must be developed and tested within the strictures set by the art itself.

Some styles or motifs seem inherently easier to deal with than others—thus the frequent association of naturalistic figures of game animals with those of men carrying hunting implements, in close proximity to springs or game trails, leads easily and naturally to the development of hypotheses involving either hunting magic or rituals designed to increase the supply of game (Elsasser 1976). However, more abstract or complex

forms of rock art are not as readily interpreted, nor do specific testable hypotheses immediately suggest themselves. This is particularly true with regard to the abstract polychrome pictographs of the Santa Barbara region, with which this paper is primarily concerned—relevant ethnographic information is generally lacking, and it seems unlikely that new primary information directly concerned with rock art will be forthcoming in the future. Any attempt to achieve a clearer understanding of Chumash rock art in its cultural context therefore must depend heavily on the evidence of the art itself, and upon whatever supplementary or indirect data can be mustered from other sources.

The complex rock art present in the geographic area occupied in historic times by Chumashan-speaking peoples has been as thoroughly described and studied as any in North America. Although it has not been possible as yet to place the art in cultural context, there is general agreement on the part of most authorities that it was produced primarily for “magico-religious” purposes, quite possibly as an expression of shamanistic experiences or practices of one kind or another. Additionally, a number of scholars have at various times advanced the specific hypothesis that these pictographs and petroglyphs represent attempts by Chumash artists to depict individual visionary experiences resulting from the ingestion of the hallucinogenic plant *Datura innoxia*. This certainly seems a viable suggestion, especially in light of what we now know about the ethnographic uses to which *Datura* was put by the Chumash (Applegate 1975). However, some scholars have preferred to suspend judgement on the question altogether, or have been openly skeptical; Heizer and Clewlow, for example, have recently made the comment that

A newspaper article . . . states flatly that certain cave paintings in the Santa Barbara area were “evidently done by Chumash Indians while ‘high’ on datura seed.” This would be most interesting if it were anything but pure speculation. The “toloache

cult” of aboriginal Southern California was practiced, in some form not reported, by the Chumash. But what is not reported from ethnographic testimony is that persons under the influence of this powerful alkaloid painted designs on the walls of caves. Unless and until we have direct information, it is advisable to restrict speculation on drug-induced explanations for California rock art [1973:43].

The problem would certainly seem to be insoluble in its present form. As tempting as it might be to posit a direct relationship between the individualistically-oriented Chumash use of *Datura* in obtaining supernatural aid, the known hallucinogenic effects of the alkaloids present in the plant, and the existence (usually in remote and inaccessible portions of Chumash territory) of rock art often characterized by bizarrely beautiful polychrome renditions of abstract or fantastic designs and figures, the fact remains that direct ethnographic confirmation of such a link does not exist at present. However, is it possible that other kinds of data might be relevant to the problem under consideration?

In recent years, scholars in a variety of disciplines have increasingly turned their attention to the intensive cross-cultural examination of that complex of behaviors that is somewhat loosely referred to as “shamanism.” In the process, they have developed a greater awareness and acceptance of the tremendous role that altered states of consciousness play in such behaviors in so many societies, and have generally ceased using such psychologically loaded terms as “neurotic” or “border-line psychotic.” They have also begun to explore the major topic of drug-induced hallucinatory experiences in cultural context (e.g., Furst 1972; Harner 1973; Dobkin de Rios 1975), with the result that we can now begin to talk with some degree of confidence about thematic universals and the effects of different kinds of sociocultural variables on such experiences. However, there have to date been few con-

scious attempts to specifically link the new data on the biopsychological aspects of shamanism and drug usage with rock art, even though such a relationship would seem to be an obvious choice for future research of the kind that is presently being carried out by the biogenetic structuralists (Laughlin and d'Aquili 1974; d'Aquili and Laughlin 1975). The one notable exception to this statement involves field work carried out by the Columbian anthropologist Gerardo Reichel-Dolmatoff among the Tukano Indians of South America; his research into the hallucinatory experiences induced by the ingestion of a decoction of the vine *Banisteriopsis caapi* have, I believe, significant implications elsewhere with regard to the investigation of works of art that are suspected to have been produced in association with shamanistic activities.

During the course of his research into the cultural context of drug usage among the Tukano, Reichel-Dolmatoff noted (1972, 1975) that all of their art forms utilized one or more of a limited set of some twenty design motifs which the Indians upon inquiry described as being based upon images seen or experienced during hallucinatory trances. These were codified or culturally interpreted by the Tukano in that any single motif was generally given the same symbolic meaning by everyone. Reichel-Dolmatoff also noted striking similarities between the Tukano design motifs and the subjective perceptual phenomena called phosphenes, and suggested that

... in a state of hallucination the individual projects his cultural memory on the wavering screen of colors and shapes and thus "sees" certain motifs and personages. There is nothing secret or intimate about the hallucinations the individual Tukano experiences. On the contrary, these are discussed openly, and, what is more striking, one individual will describe his visions to another even while he is undergoing the hallucinatory experience and will ask for an explanation of its significance! This open communication of experiences could

lead to a consensus, to a fixation of certain images; in this manner, no matter what the vision, its interpretation could be adapted to a cultural pattern [1972:110].

Reichel-Dolmatoff has thus advanced an hypothesis that directly links specific forms of artistic production with universal biopsychological phenomena frequently encountered in connection with the hallucinatory experience. Let us examine this suggestion further.

Phosphenes are subjective images experienced in the absence of external visual stimuli and having their origin within the eye and brain; their patterns seem to be "intimately related to the geometry of the eye, the visual pathway and the visual cortex" (Oster 1970: 83). Phosphenes can arise spontaneously, particularly under conditions of visual deprivation, or they can be induced by headaches or by applying pressure or electrical stimulation to the eyeball, moving the eyes suddenly, or ingesting a wide variety of chemical agents including alcohol or hallucinogenic drugs. Extensive experimentation has demonstrated

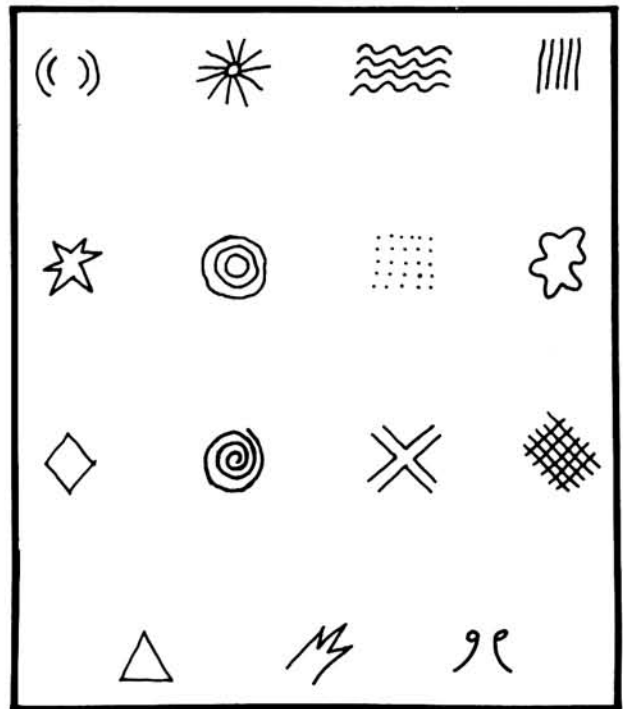


Fig. 1. Electrically induced phosphenes, in order of relative frequency (after Oster 1970).

that phosphenes are various in form but limited in number, and that some are experienced more frequently than others (Fig. 1). Thus, phosphenes constitute a limited set of universally experienced perceptual phenomena that can arise in a variety of naturally occurring circumstances.

The relationship between phosphenes and various psychoactive substances is a particularly interesting one. Some years ago, for example, during the course of an intensive investigation of the hallucinatory effects of the drug mescaline, Klüver noted that

. . . analysis of the hallucinatory phenomena appearing chiefly during the first stages of mescaline intoxication yielded the following *form constants*: (a) grating, lattice, fretwork, filigree, honeycomb, or chessboard; (b) cobweb; (c) tunnel, funnel, alley, cone, or vessel; (d) spiral. Many phenomena are, on close examination, nothing but modifications and transformations of these basic forms. The tendency towards "geometrization," as expressed in these form constants, is also apparent in the following two ways: (a) the forms are frequently repeated, combined, or elaborated into ornamental designs and mosaics of various kinds; (b) the elements constituting these forms, such as the squares in a chessboard design, often have boundaries consisting of geometric forms [1966: 66].

The form constants reported by Klüver, like the design motifs of the Tukano (Fig. 2), are of course essentially the same as the phosphenes generated experimentally by the electrical stimulation of the eye.

An important corollary phenomenon of some significance to the present discussion involves the visual aftereffects of hallucinatory drugs. For example, Oster (1970:84) reported seeing magnificent phosphenes at bedtime for some six months after having ingested a small dose of LSD in connection with another experiment. As Reichel-Dolmatoff emphasizes:

It is important to remember here that the

afterimages of phosphenes can repeat themselves for up to six months. Within this time span it is very probable in our case that the person will have taken part in one or more yajé sessions, or that he will have consumed another narcotic drug, and so the afterimages are likely to persist in a latent, chronic state, appearing in the visual field at any instant when they are triggered off by a change in body chemistry or by an external stimulus. As these afterimages might appear superimposed on the normal vision of the individual, and in plain daylight, the particular spectrum of phosphenes, together with their cultural interpretations, can be said to accompany the person in a permanent manner [1975: 174].

While the link between *Banisteriopsis caapi*, the visual phenomena called phosphenes, and Tukano design motifs seems relatively direct, we can not simply generalize from this one case and expect to find a direct correlation



Fig. 2. Tukano codified design elements (after Reichel-Dolmatoff 1972).

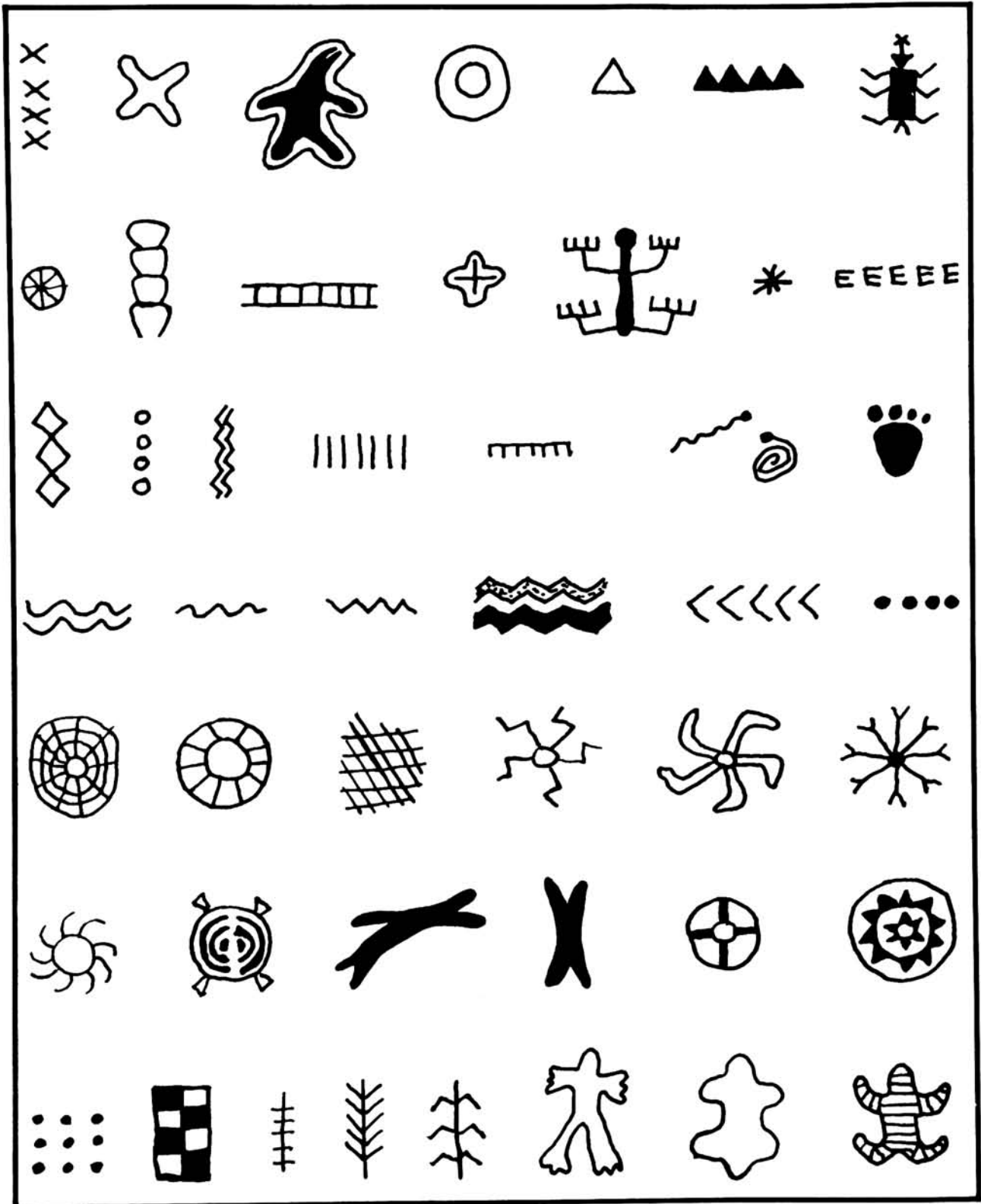


Fig. 3. Chumash pictograph and petroglyph design elements (after Grant 1965).

in every instance between the use of psychoactive drugs and the presence of particular design motifs in a society's art. Drugs vary too widely in their effects and too little research has been done on the subject for such an expectation to be considered seriously. However, I believe we can advance the following potentially testable hypotheses: (1) artistic design motifs having a wide distribution around the world (e.g., see Elsasser 1976) will tend to bear a striking and significant resemblance to phosphene images; and (2) phosphene-based motifs will tend to be particularly common in art produced in connection with ritual usages of hallucinogenic drugs. As a corollary, we might also expect differences in the effects of various drugs to be reflected in the art resulting from their use—several workers, for example, report particular color combinations associated with specific drugs (e.g., Oster 1970:84-85; Dobkin de Rios 1975:404; Reichel-Dolmatoff 1972, 1975), and it is possible that there might be other characteristic or idiosyncratic effects as well.

The particular case of Chumash rock art is suggestive if inconclusive. Grant (1965) has described the pictographs and petroglyphs of the Santa Barbara hinterland in some detail, and has isolated most of the design elements utilized by the native artists. These design elements (many of which are shown in Fig. 3) seem to me to be often strikingly similar to the experimentally induced phosphenes in Fig. 1, although I am not enough of an artist to make the kind of rigorous stylistic comparison of the two motif sets that would be desirable. However, the similarities appear to be extensive and systematic, and I feel that they provide additional support to the suggestion that many of the paintings were inspired by hallucinatory phenomena associated with the ingestion of *Datura innoxia*. Future research on Chumash rock art might explore this hypothesis further, and utilize as well our newly acquired information concerning the nature of Chumash myth and ritual (Blackburn 1976; Hudson et

al. 1977). It seems likely to me that what we are seeing in much of Chumash rock art are individual expressions of mythological themes or characters as "seen" or experienced by the artists as a direct or indirect consequence of ingesting a known hallucinogenic substance. The universal visual phenomena, phosphenes, provide basic stimuli which are filtered through the screen of cultural interpretation and myth to provide powerful religious symbols; to fully interpret these, we must learn more in the future about both the biopsychological aspects of the art and the intervening cultural screen, and about the process of interaction between the two. Here studies of contemporary situations involving the ritual use of psychoactive substances (such as Reichel-Dolmatoff's pioneering work among the Tukano) should be of considerable help. Perhaps in the not-too-distant future we will be able to approach prehistoric art in a new way, and not just look, but see.

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