

Red Ochre and Human Evolution:
A Case for Discussion¹

by ERNST E. WRESCHNER

Department of Anthropology, University of Haifa, Mount Carmel, Haifa 31 999, Israel. 12 ix 79

Prehistory has produced evidence for two meaningful regularities in human evolution: tool making and the collection and use of ochre. Tools and tool making have been acknowledged as fossil indicators of human skill, mental capacities, and social and cultural development.

The comments of anthropologists and prehistorians on ochre use have dealt mainly with the mortuary customs of the *Homo sapiens* populations of the Upper Palaeolithic. While finds of Neandertal ochre burials have been recorded, their implications for an understanding of the formative processes of color choice and color symbolism have not received the attention they deserve. It is symptomatic that in six lectures devoted to Mousterian burial rites (*Les sépultures* 1976), the red ochre found at two of the sites is ignored. In Binford's (1968) essay on the disposal of the dead in Mousterian and Upper Palaeolithic sites, we find a brief remark on ochre in Upper Palaeolithic burials but no mention of it in those of the Mousterian.

On the other hand, references to ochre phenomena create the impression that they have been an integral part of every social system and cultural unit since the Upper Palaeolithic—an assumption that is not supported by archaeological evidence. During most cultural stages—the Magdalenian and the North American Archaic are probably exceptions—ochre users have been in the minority. Nevertheless, the transcultural and trans-historical character and structural similarities of ochre practices are striking.

Because color in general and red in particular play such an important role in human behavior, studies and opinions on the mechanisms of color preference can be found in such fields as anthropology, psychology, linguistics, aesthetics, and biology. Leach (1976, 60) reports: "it is very common to find that red is treated as a sign of *danger*, which may be derived from red = blood. But red is also quite often associated with *joy*, which might come from red = blood = life." Lévi-Strauss (quoted in Charbonnier 1969:116) has remarked, "Red is a source of physical and physiological excitement." D'Andrade and Egan (1974) argue that emotional associations with color are universal in modern man's behavior but find no clear explanation for the fact that characteristics of color such as saturation and brightness are universally reacted to in terms of goodness or badness, strength or weakness.

Pickford's (1972) summary of color tests and color theories shows a predominance of but no absolute preference for red. Eysenck (1941), whose color tests involved thousands of individuals, found a preference for blue, followed by red. In Murray and Deabler's (1957) experiments on color-mood associations, red was rated as "exciting" and blue or green as "secure." Scott (1970), summarizing the results of Luescher tests, reports a preference for red. Weitman (1973:349-50), who has studied color associations in national flags, reports: "The vast majority of nations use the color Red to symbolize such things as 'wars fought against aggressors', 'military valor', 'courage', 'blood shed in battle', 'readiness to sacrifice', 'revolt', 'struggle for independence', 'revolution', etc. What is remarkable here is the extraordinary degree of consensus among all these vastly different cultures about the meaning of this color."

Bornstein, Kessen, and Weiskopf (1977:50) assert: "It can now be stated with reasonable confidence that human beings are in some manner wired or programmed for partitioning the physically continuous hue spectrum with the categories of red, yellow, green and blue." Berlin and Kay (1969), studying basic color terms in natural languages, find a cross-cultural order of appearance of terms in which red takes similar places in different societies. They suggest that the order is evolutionary in character. (Durbin [1972] questions Berlin and Kay's methods of data gathering, apparently out of suspicion of a reductionist tendency in their conclusions.) Inspired by their study, Sahlins (1977:172, 167) probes into the biological aspects of human color choice: "Color in culture is . . . [a] process of relating, not of recognizing. . . . It is not, then, that color terms have their meanings imposed by the constraints of human and physical nature; it is that they take on such constraints insofar as they are meaningful."

Obviously, color behavior should be evaluated in the light of archaeological finds, the sole fossil indicators of color preference in the earliest cultures. Finds of ochre are reported in a wide range of publications. Sometimes they are very briefly recorded and the details of their stratigraphic and cultural affiliations are either missing or unclear. Therefore the evidence has to be closely scrutinized and cases which seem insufficient identified and disqualified. Some material designated ochre may in fact be red iron-bearing rock. Alternatively, ochre may not have been recognized as such during excavation. Archaeologists should, however, be able to make these distinctions.

A significant element in red ochre finds concerns red-stained artifacts, bones, and shells and ochre-stained occupation strata. Red-stained objects are often found associated with ochred human skeletal remains. Here the question of whether the ochring of the objects and occupation layers was intentional or accidental becomes acute. If ochre or iron hydroxides (limonite) had been brought to the occupation site, heat-processed there, and rubbed or pounded on the spot, the powdery pigments could have been either dispersed during the period of occupation or dissolved then or later by water action. Besides becoming attached to various objects in the layers, they could have stained the layers themselves. That excavators are able to distinguish these details is shown by the example of Gönnersdorf. At this Magdalenian site, Bosinski (personal communication) found that in the digging of cooking holes soil impregnated with red pigment had been removed, causing intensive peripheral coloring. Inizan (1976) has reported the discovery of stone tools from Capsian sites in North Africa which had been dipped into a mixture of ochre and gypsum; a detailed study of this phenomenon would be interesting. Waste flakes with red ochre traces along their sharp edges have been found at Palaeolithic sites in Sinai; Bar-Yosef and Phillips (1977:81) suggest that they had been used to scrape ochre, and ochre has in fact been found at these sites. The practice of sprinkling ochre on the body, the ochring of parts of the corpse, and the burial of haematite or red ochre with the dead are so frequent that accidental staining through the natural occurrence of ochre on the spot can be ruled out. However, objects used in mortuary customs, snail and other shells, and animal bones and teeth may have acquired a secondary staining. Snail and other shells may have been personal belongings of the deceased, but they undoubtedly had ritual or symbolic meaning. Although an intentional ochring of these objects is plausible, it is difficult to identify, and red objects associated with burials should therefore be evaluated in the knowledge that their color may be accidental.

The earliest find of red ochre in a habitation site of early hominids is the two lumps found by Leakey (1958:1099-1103) in BKII at Olduvai. Cole (1963:137) raised the question of the probable use of ochre by Olduvai *H. erectus*. Because of the antiquity of the discovery, she rejected a body-painting hypothesis. It seems to me that the possibility of the use of ochre

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for body painting is of secondary interest. What is more interesting is that we are here confronted with evidence of a social action probably stimulated by the capacity for color categorization. Already experienced tool makers, one or several group members distinguished between these colored stones and those suitable for flaking. Collecting them and transporting them to the habitation site meant sharing an experience with others. Whether someone tried to hammer or pound them we will never know. However, Olduvai provides our first opportunity to ask what activated man's curiosity about the red color. Do we have here the first evidence of a capacity for perceptive color categorization? We can assume that the capacity for creating meaningful relationships of an ideational nature was not yet well developed, and this may be the reason some 500,000 years passed before hominids with better brains began again to experiment with red ochre.

These more advanced types were the Acheulian bands, which possessed fire and left clear evidence of intentional ochre collection and preparation. Howell (1966) reports that at Ambrona a slab of ochre was apparently deliberately shaped by trimming. A group of 75 ochre pieces retrieved from two layers at Terra Amata shows color shades from yellow to red and red-brown, with many intermediate and irregular ones attributable to different thermal influence. The raw material for the pigments—limonite—must have been brought to the site for firing. It is possible that the transformation of a yellow stone into a red one was viewed as magic—a view perhaps reinforced by the fact that when rubbed and brought into contact with liquid it was the color of dried blood, meat, or fruit and berries. The hunter-gatherers who experimented with ochre at Terra Amata are credited with other technical skills and social achievements (de Lumley and Boone 1976). The archaeological assemblage points to mental capacities which are outstanding in the Early Acheulian context. It seems possible that, because of the circumstances of its manufacture, the red pigment came to be endowed with meanings and that, through its application as a powerful medicine, relationships between it and things or between it and the human body were created (Wreschner 1976*b*). Apart from Olduvai, Ambrona and Terra Amata are so far the earliest signs of color preference. They are far removed from the stage in which color behavior is generally accepted as natural. Because of their isolation in time and space, they contain a message: they are manifestations of developments that much later, from Mousterian times on, became a “regularity” in culture.

Between the Early Acheulian ochre evidence and the emergence of Mousterian ochre practices, practically no finds are reported (the single exception is from Castillo [Alcalde del Río, Breuil, and Serra 1911, cited by Müller-Karpe 1966:288]). It is difficult to assess whether this gap reflects a real absence of interest in red pigments on the part of groups of Acheulian tradition. However, systematic studies of Acheulian sites of different stages are abundant, and if ochre had been present in any of them prehistorians would surely have recognized it.

Evidence for ochre collecting appears in the early Middle Mousterian, about 70,000 years ago. It is only towards the end of the Mousterian that the use of red ochre is documented archaeologically. Among the many excavated Mousterian sites are 15 that have yielded ochre, either in occupation levels, in burials, or in ritual depositions of diverse objects. (Not included in this number are 4 South African ochre-mining sites with African Middle Stone Age assemblages [Dart and Beaumont 1971]). The evidence for ochre use by Neandertal populations is comprised of the sprinkling of a human body at Le Moustier, the deposition of bones, jasper, and ochre around the head of a male at La Chapelle-aux-Saints, two skeletons in whose vicinity red ochre abounds at Qafza (Vandermeersch 1969), five human incisors deposited with red ochre at Pinar (Jullien 1965:164), the remains of a fallow-deer burial with ochre at Nahr Ibrahim (Solecki 1975:283), and an oval ar-

rangement of mammoth bones with red ochre in the center at Molodova (Klein 1973:69).

Ochre burials in Mousterian contexts—and, indeed, in all prehistoric periods—are fewer than those without ochre. Among roughly contemporary populations with similar technologies, often in the same region, a few groups used the red pigments while others buried their dead either without funerary gifts or with trophies of the hunt or tools. Thus at La Ferrassie, Regourdou, and La Quina there is no ochre associated with burials, but red ochre has been found in an occupation layer (C) at La Ferrassie. Again, in contrast to those at Qafza, the human remains at Ras el-Kelb, Kebara, Tabūn, Skhūl, and Amud lack ochre.

The archaeological evidence shows that it was Neandertal man who created a new dimension in human behavior that from then on was an integral part of culture. It is interesting that symbolism related to death and kin was developed by the human type supposed to have been the first to acquire the capacity for speech. We may now ask again if associative stimuli are at the root of the color symbolism of mentally advanced Mousterian populations and if red ochre was chosen as a symbolic vehicle with special properties and because of its most prominent one—the color of blood. Or is “red” now part of the neurological system and a source of preference or of relationships? These are questions I shall return to later.

With the appearance of *H. sapiens sapiens* in Western, Central, and Eastern Europe, we witness a rapid spread of ochre customs. There are 123 ochre-bearing sites, among them 25 ochre burials, reported from Aurignacian, Perigordian, Gravettian, Solutrean, and Magdalenian contexts. These reflect not only the results of archaeological efforts, but the social and cultural achievements of these hunters, symbolizers par excellence. Marine shells and animal bones and teeth are integral elements of their symbolism, found in their campsites and their burials. The mammoth, often associated with red ochre, figures prominently in the burials and ritual depositions of the Eastern Gravettians. Solutrean groups are supposed to have practiced rituals in which the human skull and red ochre played central roles (Maringer 1960). Grinding stones with traces of red are frequent; figurines and engravings on stone and bone were ochred. In Magdalenian Stages II–V ochre as a symbolic vehicle attained its widest distribution. With the exception of human figurines, all other objects found in habitation sites are also encountered in burials. The symbolic systems of these Upper Palaeolithic hunters seem to revolve around fertility and procreation, death-life, and the cycle of the seasons.

Of the 16 Mesolithic sites with ochre finds in Europe, 7 are ochre burials or depositions of ochred skulls. Some of these sites are chronologically close to the final Magdalenian, and similarities with Late Magdalenian burial customs point to a continuation of these traditions as a probable result of adaptation by Mesolithic groups. A prominent trend is the decline of the use of snail and other shells and animal bones in burials, ochre becoming dominant. Whether it was already conceived as a substitute for blood is hard to say.

In comparison with their European contemporaries, the Levantine and North African Palaeolithic and Epi-Palaeolithic groups used red pigments on a much smaller scale. Of 18 ochre-bearing sites, 6 contain ochre burials. As in their European counterparts, marine shells are frequently associated with ochre. Of the many Kebaran sites, ochre has been found in only 6. In sharp contrast to the Kebaran, which is poor in human remains, the subsequent Natufian has yielded the remains of about 200 individuals. The Natufians used red ochre selectively in their burials; individuals were buried with dentalium headbands or with red ochre or with both. It is possible that this practice reflects status differences. Ochre burials are found in the Natufian settlements of Nachal Oren, Yonim Cave, and Eynan, but not at El Wad.

Neolithic farmers used red ochre to enhance the potency of

symbolic objects, which revolved mainly around celestial phenomena. The figurines of the Eye Goddess, the rain giver, pebble figurines from Byblos, Munhatta, Sha'ar-Hagolan, and other Near Eastern sites, and fertility symbols of the Mother Earth complex were painted or coated with red ochre (Wreschner 1976a).

Of the 13 sites with ochre finds of Near Eastern pastoralists, 5 have ochre burials. In the ochre burial customs of Near Eastern and North African societies, red ochre is the sole symbolic vehicle from 6000 B.C. on.

Palaeo-Indians and populations of the Late Archaic in North America made extensive use of red ochre in mortuary customs in 10 reported burial sites (Binford 1963, 1972; Orr 1968; Ritzenhaler and Quimby 1962; Laughlin 1967).

Pastoralists of the steppes of Russia between 2000 B.C. and 1700 B.C. and populations on the island of Malta around 1500 B.C. buried their dead with ochre. In the pit, catacomb, and mound burials of the former, bones of herd animals and of hare and fox were deposited with the heavily ochred bodies. Red ochre was also placed in bowls beside the body. (The placing of a bowl of ochre in the grave recalls the Maori legend of the woman who went to the netherworld and found there a bowl of red ochre; she ate the ochre, became strong again, and was restored to life.)

In recent nonliterate societies, red is closely connected with reproduction, with "mothers," with blood, and with rituals and symbolism related to life and death. In Ndembu rites of the river source, red clay represents the blood of the "mother"; in the Ndembu twinship ritual, the act of blowing red and white clay powder from a big water-snail shell over the face and chest dramatizes the theory of procreation (Turner 1969:53-69). The association of blood with red ochre is illuminated by the Australian Aboriginal legend of the Unthippa Women (Bettelheim 1962:97). Durkheim (1957 [1912]:137) remarked, "The blood coming from the genital organs is especially sacred." Increase ceremonies and initiation rites are closely connected with red ochre (Cranstone 1973:41-42; Turner 1969:40; Wallis 1939:165). Red dresses are worn in the marriage ceremonies of Druze communities in Israel, Yemenite Jews, and Mari Baluch in Baluchistan. These are only a few examples from the wealth of data revealed by ethnographic studies on the customs, rituals, and symbolism related to death-life and fertility and procreation.

The relationship between ochre and blood and between ochre and "mothers" is signified by the Greek *haema/haïma* (as in haematite), which means "blood." Dart (1968:24) has drawn attention to the fact that "Haima is the most emphatic form in which the basic root MA could be vocalized. *Metra* in Greek and *matrix* in Latin 'womb' refer more properly to its entrance, the vulva." Turner (1967:172) has observed that the womb is in many cultures equated with the tomb and both associated with the earth, the source of fruits. It is believed that ores grow inside the earth like an embryo in the womb. Eliade (1954:56) remarked that for nonliterate peoples ores belong to the domain of the Earth Mother. It was customary in Swaziland, in historic times, to fill in the excavation of red minerals to avoid offending the spirits of the underworld (Raymond Dart, personal communication).

In modern cultures black, white, red, green, yellow, and blue play important roles in communication systems and technology. The choice of these colors for signal devices is without doubt influenced by their physical properties and man's perceptual system, in which associative reactions serve as signals. Red is hot and blue is cool; red is danger (stop) and green is safety (go). Is it a coincidence that in these color relationships human choice follows the same principles as the development of basic color terms in languages?

In this brief survey, the attraction to ochre has led us like a red thread through more than 500,000 years of man's history. The study of color preference demands attention to the extraor-

dinary similarities and repetitive patterns in symbolic actions. Although these patterns become distinguishable only with Mousterian populations, the earlier instances of red color attraction seem to be part of an evolutionary cognitive process.

Cognition is knowing or acquiring knowledge. The perception of red, the ability to discriminate colors, led to actions that resulted in new experiences and learning. Part of the cognitive process is the endowment of objects—in this case ochre—with meaning. The creation of relationships resulted in social and cultural structures. One such relationship might be body painting, which could, as a signal device, have contributed to group coherence (Wreschner 1976b).

Recognition is knowing again. What can be recognized must already exist in the mind; it must be something similar or identical to something previously learned or known. Jung (1964) holds that the mind is as much a product of evolution as the body. The color behavior of early hominids shows nothing that can be interpreted as recognition. Awareness and the capacity for abstraction seem not yet sufficiently developed to permit it. This is perhaps the meaning of the 500,000-year gap between *H. erectus* and *H. sapiens neandertal*.

Biology is at the root of human color behavior. Archaeology makes this clear and demonstrates that biological foundation and human color choice are inseparable and interacting. It seems unwarranted to conceive of color behavior, as Sahlins (1977:172) does, solely as "a process of relating." All relationships between ochre and ideas also indicate, since Mousterian times, the capacity for recognition. The Neandertal innovation relating death and red ochre—probably with the idea of connecting blood with life and life/blood with red ochre—and its widespread adoption or invention cannot be satisfactorily explained in terms of a process of relating only or in terms of diffusion. As a result of evolutionary processes that are not yet understood, perceptive categorization—wiring or programming—became part of the human equipment, of human nature. Being of selective value in general, but not necessarily in the particular case of red color, it could be utilized in the formative processes of symbolism by way of recognizing and relating. Thus red pigments could become a synonym for blood and life, for danger and death.

While present-day nonliterate societies still employ red ochre or red objects as symbolic vehicles for human blood or for the female principle, modern civilized man, with his evolutionary, biologically rooted color associations, can and does use red more and more. Thus we witness here and there the survival of red ochre traditions such as *hina* in Asian communities, though in most cases devoid of their original meaning. Modern man, with his great capacity for abstraction and his universal equipment for utilizing color associations, employs the color red itself as a potent social and cultural symbol. Here, too, as Weitman's (1976:62) study shows, red is equated with human blood in contexts of an emotional character.

Comments

by RALPH BOLTON

Department of Anthropology, Pomona College, Claremont, Ca. 91711, U.S.A. 5 III 80

Color is a topic enjoying vigorous and exciting research efforts in anthropology at present. Indeed, this subject is one of those most blessed by a sustained interest and progressive theoretical refinement (not to mention Kuhnian turmoil). During the past decade valuable contributions to the understanding of human color behavior have come from biological, cultural, linguistic, and psychological specialists. It was about time for archaeologists to join the fun. I hope that Wreschner's short article will stimulate discussion not only of the specific case that he presents, but more generally of the relevance of archaeological data to color-research issues. By pointing to

potential implications of red ochre finds for color problems, Wreschner has placed us in his debt; we shall be even more indebted if his lead results in further input from archaeology. We have been aware for a long time of the presence of red ochre in prehistoric sites, particularly associated with burials, and that presence has often been cited as evidence for the existence of religious beliefs and rituals and, more broadly, of the symbol-using capabilities of the populations involved, e.g., Neandertal. As far as I know, however, the significance of the color red in this context has not been sufficiently appreciated. Hence I found Wreschner's comments intriguing.

In view of the prominence of red in the evolutionary sequence of basic color terms (Berlin and Kay 1969) and in the results of intracultural and cross-cultural studies of the relative salience of color categories (cf. Bolton 1978, Bolton and Crisp 1979, Bolton, Curtis, and Thomas n.d.), it is noteworthy that red should be *the* color that stands out in the archaeological record from such early periods as those indicated in this article and especially in contexts suggestive of the deliberate, symbolic use of color. As a nonarchaeologist, I was not certain how to interpret this fact, however. Might there be some explanation for the salience of red archaeologically that has nothing to do with symbolism or with human perceptual capacities? Could other objects carrying symbolic color information fail to have survived? Is red ochre more likely to be durable than such objects and their corresponding color information (e.g., flowers)? The author does not deal with the possibility that other colors might have been as important as red but that the data simply are deficient with respect to such colors. This question, it seems to me, should be addressed.

Regardless of the answer to that question, though, I suspect that red was symbolically important, as the author claims, if not as the most salient color, then surely as one of the most salient. The importance of red in ritual contexts is apparent in the data provided by Wreschner. Interestingly, recent work has demonstrated that the relative salience of color categories most closely parallels the evolutionary sequence of color terms precisely in the domain of ritual (the goodness of fit is considerably lower for subsistence domains and somewhat lower for other domains of expressive culture) (Bolton 1978). It could be argued that it is in the ritual domain where the biological structures responsible for the relative salience of colors would be most visible, since this domain of human activity is less completely constrained by immediate environmental and utilitarian factors than other domains are. Not only is "biology the root of human color behavior" as Wreschner claims, but it is especially in the area of ritual symbolism that those roots are most easily exposed: here the outcome of evolutionary processes is laid bare. This is striking, of course, because of the tendency for ritual to be thought of as perhaps the most highly symbolic (read "cultural") activity in which humans engage. It could be argued, further, that deeply meaningful symbols or symbol systems are those that faithfully reflect or are isomorphic with the relevant biological structures. This would account for the widespread occurrence in rituals cross-culturally of the color triad black-white-red, noted by Turner (1967).

A second domain in which the relative salience of color terms rather closely mirrors the evolutionary sequence is that of folktales. In this domain humans do not seem unduly bound by considerations of veridicality and relative environmental ubiquity in their use of color terms (Bolton and Crisp 1979). Just as prehistoric populations often liberally employed red ochre in ritual contexts, contemporary people in many cultures generously apply the label "red" to a broad range of objects. In one analysis of the types of objects to which different color terms had been attached, it was discovered that red was the most salient hue (i.e., excluding "color" terms for black and white). The number of object classes to which red was applied was approximately two and one-half times as large as the number

to which any other color label had been applied. Yellow, green, and blue were mentioned with almost equal frequency but much less often than red. In a sample of tale texts from 40 cultures, red was found to be the most salient color term in 27 collections of tales, tied for highest salience in 3 collections, and less salient than another color in 10 collections. Thus the prominence of red symbolically is fully documented ethnographically in realms of expressive culture.

Wreschner uses the word "preference" in relation to human orientations to red, but salience is really what he is discussing. There is a real, though subtle, difference between these terms, and the difference may be important. He cites some studies reporting results which show that people may prefer other colors to red, for instance, blue (Eysenck 1941). The fact that red is prominently associated with prehistoric remains does not necessarily imply that red was better liked but only that it was used as an important vehicle of symbolic communication. It was and continues to be salient for humans.

Wreschner mentions work by D'Andrade and Egan (1974) on the emotional associations with color and their argument that such associations are universal. It is germane to point to other research on this topic, especially that by Osgood, May, and Miron (1975), who found red to be the color highest on their potency dimension of affective meaning. Wreschner refers to red as a "potent social and cultural symbol," but the basic point is that red connotes potency more than any other color does. Thus, cross-culturally red symbolizes or has the meaning of power as much as it does of danger, blood, and so forth. In a sense, the use of red in the context of death (burials/hunts) may seem anomalous, since this is the situation in which humans may be the least powerful. They can do nothing to reverse the ultimate fact of death. Because of its connotations of power, red is the most appropriate color to employ to symbolize defiance of death. Or its use may represent an attempt, however unsuccessful, to overcome death, to reverse the process, to restore power. The use of red may signal a denial of human weakness and of death as a threat to human survival.

What is remarkable is the "magic" involved in ochre's color transformation, i.e., from yellow to red. This process may be crucial in explaining why ochre was used rather than some other red object. I would like to suggest two reasons this yellow-red transformation might be significant. First, the color next in salience to red tends to be yellow. Occasionally one encounters data in which yellow cedes second place to blue or green, but on average yellow is more salient than either of these. This is true not only of intracultural data on color-term salience, but also of the patterns of lexical development (Witkowski and Brown 1977:52). Second, while red is at the top of the list of colors as far as potency is concerned, yellow is at the bottom. Consequently, ochre is especially suitable as a ritual symbol because it involves the transformation of something that is highly salient into something that is highest in salience perceptually and because it involves the transformation of weakness into power. Death, of course, is the opposite transformation, from power to weakness. The use of ochre may be an attempt to reverse the latter transformation or to deny it by juxtaposing it with its opposite. Similar reasoning could be involved in the use of ochre with respect to hunting. If one wishes to kill an animal one might symbolize this by juxtaposing the weakness-to-power shift of ochre with the intended power-to-weakness shift of the hunt (i.e., the animal's death). In each case one wishes to transform something on the power dimension, but timing probably differs in the two contexts, with ochre being used after a human death has occurred but prior to the animal's death (smear on tools or on the remains of previous kills before going out on a hunt).

Wreschner accepts the received wisdom on the importance of the symbolic relationship between blood and red. I have an uneasy feeling that too much is made of the obvious fact that red often symbolizes blood. Clearly the salience of red is not

due to its association with blood; the research by Bornstein, Kessen, and Weiskopf (1976) demonstrates the priority of perceptual salience and the importance of physiological factors as determinants of color-term salience (cf. von Wattenwyl and Zollinger 1979). The neurophysiological basis of color vision renders red markedly salient for humans, and it is entirely plausible that the salience of red, which appears to be wired into the species, is responsible for the potency of blood as a symbol. One might speculate that it is not because blood is red that red is a powerful symbol but rather it is the redness of blood that makes blood a powerful substance symbolically. Would blood be as potent a symbol if it were grey? Red heightens the symbolic significance of blood rather than vice versa.

by KARL W. BUTZER

Departments of Anthropology and Geography, University of Chicago, Chicago, Ill. 60637, U.S.A. 24 I 80

Ochre is undoubtedly a prominent feature in some later prehistoric sites. However, many claims for ochre are spurious, based not on competent analyses or contextual evaluation, but on unseasoned archeological field conclusions. As a result, perhaps a majority of the claims for ochre in particular archeological associations are either inconclusive or simply wrong.

Red pigment can be obtained by grinding down hematitic or limonitic concretions (such as specularite or true ochre) as well as ferruginized shales or sandstones. It can be derived from a paste made from sesquioxide-rich clayey or sandy soils. Finally, blood can also be used for the purpose. "Ochre" is therefore a misleading generic term, and there is a major difference whether a reddish rock is collected for curiosity purposes, whether nonstaining rock powder is generated, or whether a red stain is produced from a red "soil," a partly lithified ferric powder, or blood plasma. In each case identification and archeological interpretation pose different problems that must be dealt with explicitly. The issue is too complex to lend itself to a generalized discussion of "ochre in archeological sites."

The "ochre slab" at Ambrona was a reddish siltstone which, because of natural fractures along the laminate structure, appeared to be flaked: to prove human modification would be next to impossible. In its specific context, the rock was one of many manuports but could have been obtained at no great distance. There is no evidence of rock pulverization. Red stain could have been far more easily obtained from a paste of local red soils, but this would have left no permanent record. In the other instance of an early site, Hay (1976:185) has not explicitly verified the nature of the "two lumps of ochre" originally reported by Leakey for Olduvai Bed II (Upper).

None of the stratified Acheulian open-air or cave sites where I have studied archeological sediments—in Spain (Torralba and Ambrona) and South Africa (Wonderwerk, Rooidam, Doornlaagte)—provide evidence of ochre manipulation or use. Without wishing to deny the use of ochre in Middle Paleolithic sites, particularly in certain French burials, I have also been unable to verify its use in Mousterian strata of northern Spain (Cueva Morín, Castillo, La Flecha, El Pendo, Cobalejos) or Middle Stone Age occupations in South Africa (Border Cave, Bushman Rock, Rose Cottage Cave, Klasies River Mouth, Nelson Bay Cave), despite instances in which some excavators have claimed otherwise. Red rocks are present in a few but are of local origin and contain little iron. Purportedly ochre laminae invariably are fire-baked ("ceramicized") sediment, resulting from oxidization in response to high floor-contact temperatures under hearths. In fact, silt- or sand-sized grains or laminae of red-fired sedimentary aggregates pose a major problem in the physical analysis of the residues of most intensively occupied sites. If a fire is set in a burial pit prior to or subsequent to interment (a reasonably common practice with ethnographic or late prehistoric groups), the baked sediment

can easily simulate ochre powder to the uninitiated. Less problematical are ochre-smearred rocks, which I have indeed been able to verify in Upper/Late Paleolithic sites, or the well-known red paints employed in parietal or mobiliary art.

I would suggest that Wreschner has made a plausible case for the relevance of ochre in "social and cultural development" but not in "human evolution" in the strict sense. More importantly, I would like to plead for a more responsible approach to the analysis and interpretation of "red" materials in the archeological record before sociocultural significance is attached to them.

by HENRI DELPORTE

Musée des Antiquités Nationales, 78103 St. Germain en Laye, France. 8 III 80

Il me semble que le problème de l'ocre au Paléolithique est d'abord de réunir une information objective et de tenter d'en évaluer la pertinence, avant de recourir à la comparaison ethnographique en vue d'en déterminer l'usage et la signification, usage et signification qui peuvent d'ailleurs être multiples (j'ai signalé, à titre anecdotique, que l'ocre se révèle extrêmement utile dans l'opération de gravure sur os . . .). Dans cette optique, il est nécessaire de préciser les points suivants:

1. Quelles sont les variétés minérales qu'on groupe sous le nom d'ocre? Quelles sont leurs propriétés physiques et chimiques? Peut-on déterminer leur origine et, de ce fait, leurs cheminements? Les recherches de Couraud (1978) sont intéressantes à ce sujet.

2. Wreschner parle de dissolution de l'ocre par l'eau. Ce type de migration est-il possible? A-t-il été étudié? N'existe-t-il pas d'autres types de migration?

3. Quels sont les caractères intrinsèques des découvertes d'ocre—sous forme de masse amorphe, de «crayons», de poudre, etc.?

4. Quels en sont les caractères extrinsèques? L'ocre a été observée dans les sépultures; sous quelle forme? où? L'absence d'ocre dans certaines sépultures est-elle en corrélation avec d'autres phénomènes? On a observé la présence d'ocre sur des oeuvres d'art, par exemple sur des figurations féminines (Willendorf, Laussel, etc.) ou sur des objets variés, par exemple à la Madeleine; y a-t-il des localisations particulières (par exemple, à Laussel, sur les seins et le ventre)? La présence de l'ocre a également été observée dans des habitats: dans le niveau inférieur de l'abri du Facteur, à Tursac (Dordogne) (Aurignacien I), j'ai observé (Delporte 1968) la coloration très intense sur la surface d'occupation située en arrière des foyers, avec entraînement de l'ocre par l'eau—avec ou sans dissolution?—dans la couche de plaquettes de gélifraction sous-jacente. Existe-t-il des localisations de l'ocre à l'intérieur de l'habitat? Ces localisations ont-elles tendance à être systématiques?

Lorsqu'une telle information aura été réunie et «pesée», il sera beaucoup plus facile de tenter de préciser les conditions de l'utilisation de l'ocre par les hommes du Paléolithique.

[It seems to me that the problem of Paleolithic red ochre is first of all to gather objective information about it and try to evaluate the pertinence of that information before we rush off to make ethnographic comparisons with a view to determining its use and significance. Moreover, its use and significance may be multiple (I have pointed out anecdotally that ochre has proved extremely useful in the process of engraving bone). From this point of view, the following questions must be raised:

1. What are the various minerals that we group under the name of ochre? What are their physical and chemical properties? Can their origin be determined, and can we then determine the changes they have undergone? Couraud's (1978) studies in this area are very interesting.

2. Wreschner speaks of the dissolution of ochre by water. Is

this means of spreading possible? Has it been studied? Are there no other ways in which this can happen?

3. What are the *intrinsic characteristics* of the ochre finds—amorphous mass, “crayons,” powder, etc.?

4. What are its *extrinsic characteristics*? Ochre has been found in graves; in what form? where? Is there a correlation between the absence of ochre in some graves and other phenomena? Traces of ochre have been found on art objects, e.g., on female figurines (Willendorf, Laussel, etc.) or on a variety of objects (La Madeleine). Are there any particular spots in which it is found (e.g., at Laussel it was on the breasts and abdomen)? Ochre has also been found in dwellings; in the lower level of the Abri du Facteur at Tursac, Dordogne (Aurignacian I), I observed a very intense colouring of the habitation floor behind the fireplaces, with the ochre having been carried by water into the underlying layer of frost-shattered slabs. Are there certain locations within dwellings where ochre is found? Do these locations appear to be systematic in any way?

When this type of information has been gathered and weighed, it will be easier to try to make some precise statements on the use of ochre amongst Palaeolithic peoples.]

by ALEXANDER HÄUSLER

Zentralinstitut für Alte Geschichte und Archäologie der Akademie der Wissenschaften der DDR, Leipziger Str. 3/4, 108 Berlin, German Democratic Republic. 10 II 80

Es ist sehr zu begrüßen, daß Wreschner das Problem der Ockerfärbung in der Urgeschichte aufgreift. Die Bedeutung der Ockerfärbung wurde bereits von Bachofen (1925 [1859]), erkannt, um dann immer wieder diskutiert zu werden (z.B. Timm 1964, Ecsedy 1979: 39–40). Belege für das Farbempfinden, die sich nicht allein auf die rote Farbe beschränken, sind anscheinend schon seit der Zeit der Neandertaler überliefert (Smolla 1967). Worauf hier hingewiesen werden soll, ist die enge Verbindung zwischen der Verwendung von Ocker im Bestattungsritual bei den Jäger- und Fischerkulturen Eurasiens, während beim Übergang von der aneigenenden zur erzeugenden Wirtschaft diese Sitte jeweils an Bedeutung verliert (Häusler 1974, 1976). Bei den epipaläolithischen, mesolithischen und subneolithischen Jäger- und Fischergruppen Nordeurasiens ist die Ockerfärbung der Toten, d.h. die Bestreuung des Leichnams mit Ocker, häufig auch die Ockerfärbung der Beigaben, ein besonders auffallendes Phänomen (Häusler 1962). Die zur Landwirtschaft, insbesondere zur Viehhaltung, übergegangenen Träger der zwischen Ural und Karpaten verbreiteten Ockergrabkultur (3.–2. Jt. v.u. Z.) lassen die kontinuierliche Weiterentwicklung der Bestattungssitten solcher Jäger- und Fischergruppen erkennen. Dabei fällt auf, daß hier der Brauch der Ockerfärbung im Laufe der Zeit an Bedeutung verliert. Es läßt sich indessen nicht konkret feststellen, welche Änderungen der ideologischen Vorstellungen diese Verringerung der Ockerfärbung bewirkten. Ocker tritt in dieser Kultur als Farbstreuung, aber auch als Beigabe vom Klumpen oder sogar von eiförmigen Stücken auf, die bisweilen in großer Zahl beigegeben wurden (Häusler 1974:96; Ecsedy 1979:39–40). Hier liegt die Verbindung zwischen dem eiförmigen Ockerstück und der recht häufigen Beigabe von echten Vogeleiern (Häusler 1974:96; 1976:66) als Ausdruck des Gedankens der Wiedergeburt auf der Hand. Auch dieser Symbolik ist bereits Bachofen (1925 [1859]) im Detail nachgegangen.

Es ist aber zu beachten, daß der Terminus «Ockerfärbung» und «Ocker» nur zur allgemeinen Kennzeichnung eines roten, rötlichen oder gelben Farbstoffes dient. Chemische Analysen haben nur sehr selten stattgefunden. Für das Material aus Gräbern der Ockergrabkultur, die man in Ungarn untersuchte, konnte nachgewiesen werden, daß es sich um Hämatit handelte, der in dem betreffenden Gebiet überhaupt nicht vorkommt,

oder um rot gefärbte Erdklumpen (Ecsedy 1979:40). Dadurch tritt die symbolische Bedeutung von «Ocker» in diesen Gräbern nur noch deutlicher hervor. Ähnliches ist auch für die meisten anderen ur- und frühgeschichtlichen Kulturen anzunehmen. Daneben ist aber auch eine einfachere, profane Deutung der Verwendung von «Ocker» nicht auszuschließen, wie das von den Ureinwohnern Australiens bezeugt ist (Timm 1964). Deshalb wäre es problematisch, von der Auffindung von Ocker in Siedlungsschichten oder Gruben automatisch auch auf eine rituelle Verwendung in den betreffenden Kulturen zu schließen.

[It is very gratifying to see Wreschner taking up the problem of ochre in prehistoric times. Bachofen (1925 [1859]) was aware of the significance of ochre, and it has been widely discussed ever since (e.g., Timm 1964; Ecsedy 1979: 39–40).

Evidence of the perception of colour, which is not confined to red alone, has apparently come down to us from the time of Neandertal man (Smolla 1967). There is a close relationship between the use of ochre and burial rites among Eurasian hunting and fishing cultures, but this custom lost its significance during the transition from an adaptive to a productive economy (Häusler 1974, 1976). In the Epipalaeolithic, Mesolithic, and sub-Neolithic hunting and fishing groups of northern Eurasia, the ochre colouring of the dead (i.e., the sprinkling of the bodies and often also the grave objects with ochre) is an especially striking phenomenon (Häusler 1962). The bearers of the Ochre-Grave culture (3d–2d century B.C.), located between the Urals and the Carpathians, who had adopted agriculture and especially cattle raising, still show signs of the persistence of this burial custom associated with fishing and hunting groups. Thus it is quite striking that the custom of using ochre lost its significance with the passage of time. It cannot be firmly established what actual changes in ideology brought about the decrease in this custom. Ochre appears in this culture as a powder for strewing, but it is also found as lumps or egg-shaped pieces in graves, which are sometimes present in large numbers (Häusler 1974, Ecsedy 1979:39–40). The relationship between the egg-shaped pieces of ochre and the large number of actual birds' eggs found in the graves (Häusler 1974:96; 1976:66) is clearly an expression of the concept of rebirth. Bachofen (1925 [1859]) has investigated this symbolism in some detail.

We should, however, be aware that the terms “ochre dye” and “ochre” are used only in a general way to designate a red, reddish, or yellow colorant. Very few chemical analyses of this substance have been carried out. It can be shown that the material found in certain Hungarian Ochre-Grave culture sites was actually hematite (which does not occur in the area) or red-coloured clumps of earth (Ecsedy 1979:40). Thus the symbolic significance of “ochre” in these graves stands out even more clearly. Similar assumptions can be made for most of the other prehistoric and early historic cultures. In this connection one cannot rule out a simpler, nonreligious significance for the use of “ochre,” such as that evidenced by the Aborigines of Australia (Timm 1964). For this reason it would be questionable to conclude definitely that the presence of ochre in graves or settlement sites automatically means that it had a ritual purpose in that particular culture.]

by ALBERT HEINRICH

Department of Anthropology, University of Calgary, Calgary, Alta., Canada T2N 1N4. 12 II 80

Wreschner performs a valuable service and also leaves something to be desired. In writing a longish—perhaps overlong—article about an already rather well-known set of facts, he demonstrates once more that the science of archeology lies within the realm of anthropology and is not, as some have tried to make it, digging things out of the ground. Its essence lies in theoretical interpretation of the materials themselves. Ideas, not things, are what count in our discipline.

The something to be desired consists of three sorts of things:

1. There should be something more concrete than a Frazer-like enumeration of hints about the uses of red—the myth of the Maori woman, Durkheim's remark that "the blood coming from the genital organs is especially sacred," the mention of red dresses worn in marriage ceremonies, etc.

2. Having shown that red is archeologically as well as synchronically salient, he (or somebody) should again begin working where Gladstone, Geiger, Magnus, Allen, Bucke, and other early workers in the field left off (see Heinrich 1978), i.e., filling the gap (protohistory) between archeology and ethnology.

3. To complement a fascination with the emergence of red, it would be interesting to collect and interpret evidence of the early occurrences and the consistent use of other materials that are color-related.

by ANITA JACOBSON-WIDDING

Department of Cultural Anthropology, University of Uppsala, Kungshusetgatan 19, 75322 Uppsala, Sweden. 13 III 80

Wreschner has raised questions which call for joint efforts by anthropologists, physiologists, and psychologists in order to be answered. I shall confine myself to some methodological comments from a structural anthropological point of view.

I have two main objections to Wreschner's approach to the interpretation of the colour red as a symbol in "early" cultures. One is to his "phenomenological" view of red as a symbol of blood. The other is to his contention that this symbol can be analyzed without reference to its relations with other symbols on the same level of expression, that is, other colours.

Wreschner interprets the colour red as a symbol of blood. Nevertheless, he treats it as a polysemic symbol. Any "dominant symbol" (cf. Turner 1967:31) has varying references in different contexts, even within the same culture. In the matrilineal cultures of Central Africa, for instance, the colour red may signify father, woman, man, mediator, certain categories of relatives (i.e., in-laws), rainbow, morning, birth, emotions, sexual desire, mystic power, transitory stages in rites de passage, etc., according to the situation and context in which it is used (Jacobson-Widding 1979).

In order to serve as a public symbol, a polysemic symbol must retain a general meaning which is common to all its varying references. In the case of Central Africa, the general meaning of red is connected with ambiguity. Red denotes anything that is felt to be "neither one nor the other"—neither right nor wrong, neither true nor false, neither "own clan" nor "stranger clan," neither heaven nor earth, etc. It signifies virtually everything that defies classification according to the a priori criteria for demarcation of distinct categories employed by the peoples of this region. Since red is a symbol of indeterminacy in a society which believes in a perfectly determined order, it has dynamic properties and is connected with magical power.

If a polysemic symbol retains the same general meaning across its varying references, it must represent something more abstract than just another tangible object, whether it be blood, milk, or excreta (cf. Turner 1967:88-89). Representing some abstract notion, the symbol must be interpreted with consideration for its relations with other symbols on the same level of expression. Understanding of a symbol in isolation from other symbols is possible only if the sign is regarded as an icon of some concrete phenomenon, such as blood. Blood is blood, irrespective of its potential relations with milk or excreta. If, however, a sign is viewed as a symbol of an abstract concept (cf. Langer 1953, Firth 1973), it cannot be understood without reference to its "syntagmatic neighbours."

An abstract notion cannot be defined or even approximately focused as a "fuzzy set" (cf. Kay and McDaniel 1978) without being related to at least one more concept—whether in terms of opposition, comparison, or dependence. The same must

apply to the symbols of abstract notions. For example, the concept of "right" cannot be understood without being related to "wrong," and the concept of "moral neutrality" cannot be comprehended without reference to "right" and "wrong." If a certain culture were to have visual symbols of these three concepts, for instance, "white," "black," and "red," none of these symbols could possibly be interpreted without reference to at least one of the other two. Hence, the syntagmatic relations between symbols on the same level of expression must be taken into consideration in interpreting symbols of abstract notions.

According to Berlin and Kay (1969), no culture can be expected to identify only one colour. There are at least two colours for which any culture has basic terms, white and black. When there is a third term, it is always red. If we assume a consistency between the basic colour terms and the colours actually used in any culture, no society will content itself with the use of red only. Furthermore, if we assume that cultures with a few colour terms really mean something with their choice of colours for identification, these few colours may be expected to play an important role as ritual symbols or as devices for classification. Hence, there is good reason to believe that red is accompanied by at least two more colours whenever it is found as a salient symbol, as is the case with those early cultures to which Wreschner refers. These other colours should be white and black. There is no reason for leaving them out of the analysis of the colour red as a symbol or for disregarding the relations among the three colours.

by TADEUSZ MALINOWSKI

Wyższa Szkoła Pedagogiczna, Zakład Historii, Arciszewskiego 22a, 76-200 Słupsk, Poland. 5 III 80

Z dużym zainteresowaniem przeczytałem bardzo skrótowo potraktowany artykuł Wreschnera. Choć kwestii znaczenia kolorów—zwłaszcza czerwieni wraz z jej odcieniami—poświęcono już pokaźną ilość publikacji (a sam Wreschner przytacza najistotniejsze wnioski, jakie wysunięto na ten temat), interesująco przedstawia się sprawa możliwości bardzo wczesnego wykorzystywania ochry.

Polskie materiały archeologiczne stosunkowo późno—w środkowej kulturze magdaleńskiej—poświadczają użytkowanie ochry: jej grudki, m.in. ze śladami ścierania, znaleziono w Jaskini Maszyckiej. Jeszcze młodsze—późnopaleolityczne, są natomiast dowody użytkowania innego barwnika—hematytu. Jednakże, jak się wydaje, znaczenie hematytu jako środka dla uzyskiwania kolorów czerwonych jest w tym czasie poważniejsze, niż znaczenie ochry. Świadczy o tym okoliczność, iż hematyt dobywano sposobem górniczym w kopalniach odkrytych na północno-wschodnich stokach Gór Świętokrzyskich, zaś w rejonie jego eksploatacji występuje niezwykle nagromadzenie śladów ówczesnego osadnictwa (Schild 1975:325). Ziarna hematytu uzyskane we wskazanym rejonie były częściowo przerabiane na barwnik na miejscu, w części zaś przenoszone przez wędrujące gromady ludzkie w odległe okolice, co poświadczają jego znaleziska w obrębie kilku badanych stanowisk—obozowisk łowieckich. Najodleglejsze stanowisko, na którym natrafiono na niewielkie zagłębienie wypełnione pyłem hematytowym, usytuowane w zachodniej Polsce, jest położone ok. 400 km w linii prostej od miejsca eksploatacji tego minerału.

Wydobywanie hematytu w kopalniach u podnóża Gór Świętokrzyskich trwało nadal w mezolicie, a także w neolicie. Nadal też—jak o tym świadczą znaleziska z terenu osad—służył on do wyrobu barwników przy użyciu kamiennych tłuczków i rozcieraczy, przy czym również na obszarach znacznie oddalonych od rejonu eksploatacji (Więckowska 1975:410; Kulczycka-Leciejewicza 1979:82, 134). Jednakże najstarszy pochówek z ziem polskich, mezolityczny, odkryty w Janisławicach, miał jamę grobową zabarwioną ochrą, którą

posypano zwłoki (Więckowska 1975:417). Analogiczny zwyczaj towarzyszył też obrządkowi pogrzebowemu niektórych plemion neolitycznych rozmaitego w dodatku pochodzenia—kultur ceramiki dołkowej i dołkowo-grzebykowej, wchodzących w skład kręgu kultur subneolitycznych (Wiślański 1979:323, 331) oraz w starszych i młodszych kulturach wywodzących się z kręgu naddunajskiego: w kulturze ceramiki wstęgowej rytej i w kulturze lendzielskiej (Kulczycka-Leciejewiczowa 1979:94, 162). Do pierwszej z tych kultur naddunajskich należy również pochówek kobiety, trzymającej w dłoniach naczynie gliniane wypełnione ochrą. Zwyczaj barwienia zwłok—zapewne ochrą—był także znany niektórym neolitycznym plemionom z kręgu kulturowego ceramiki sznurowej, np. w kulturze złockiej (Machnik 1979:382). Jednakże w wielu innych kulturach młodszej epoki kamienia zwyczaj ten nie był praktykowany—brak bowiem śladów jakichkolwiek barwników w niekiedy dosyć licznych grobach reprezentujących te inne kultury.

W epoce brązu i we wczesnej epoce żelaza brak jest na ziemiach polskich zupełnie wyraźnych śladów używania barwników w obrządku pogrzebowym, jednakże w kilku grobach ciepłopalnych oraz bez śladu pochówka (szkieletowy?) ludności kultury łużyckiej znajdowano grudki ochry oraz naczynie wypełnione czerwonym piaskiem (Malinowski 1962:88).

Z powyższego zwięzłego przeglądu polskich materiałów archeologicznych zdaje się wynikać, że barwniki mineralne czerwonopodobne były przez wiele spośród pradziejowych ludów, lecz przede wszystkim w starszej, środkowej i młodszej epoce kamienia. Ludy te są bardzo zróżnicowane pod względem pochodzenia, reprezentują także różne formy gospodarki. Barwniki były zaś wykorzystywane zarówno w obrządku pogrzebowym, jak i w innych przejawach życia (znaleziska z terenu osad). Oprócz ochry duże znaczenie miał w tym zakresie także hematyt.

Na marginesie tego przeglądu warto zasygnalizować, że najprawdopodobniej również czerwone barwniki roślinne odgrywały rolę w rozmaitych zwyczajach ludów pradziejowych, choć ich ślady są oczywiście nadzwyczaj trudne do uchwycenia. Sądzę tak na podstawie grobowego znalezienia owoców nawrotu lekarskiego (*Lithospermum officinale* L.) w okolicy głowy jednego z nieboszczyków należącego do kultury lendzielskiej (Kulczycka-Leciejewiczowa 1979:162–64), a także w związku ze znalezieniem owoców głogu (*Crataegus* sp.) w kilku grobach ciepłopalnych ludności kultury pomorskiej z wczesnej epoki żelaza (Łuka 1971:72).

[I have read Wreschner's very concise article with interest. Though a great number of reports have been devoted to the meaning of colours—especially of red and its shades—and though Wreschner himself cites the most essential conclusions set forth in this matter, there is still another question which interests me, and that is the earliest use of ochre.

The Polish archaeological record testifies to the use of ochre as early as the Middle Magdalenian; lumps of it bearing traces of abrasion were found in Maszycka Cave. Later, in the Late Palaeolithic, there is evidence of the use of another colouring substance, haematite. It seems that during this period the significance of haematite as a source of reddish tints prevailed over that of ochre. In the northeastern Holy Cross (Świętokrzyskie) Mountains, haematite was extracted from primitive mines, and traces of settlement are exceptionally abundant in the surrounding area (Schild 1975:325). The haematite mined in the region was partly processed for dyestuff on the spot and partly transported far away by migrating groups that left remains of it in their hunting camps, known from numerous explored sites. The farthest site in which haematitic powder has been discovered is in western Poland, some 400 km from the spot where this mineral was exploited.

The extraction of haematite from mines in the Holy Cross Mountains went on throughout the Mesolithic and far into the Neolithic. Remains excavated in settlements testify that it

continued to be produced as a dyestuff by using beaters and grinders, even in regions at a considerable distance from the source (Więckowska 1975:410; Kulczycka-Leciejewiczowa 1979:82, 134). The oldest burial in Poland, discovered at Janisławice and dated to the Mesolithic, had its pit-walls tintured with the ochre used to sprinkle the corpse (Więckowska 1975:417). A very similar usage accompanied the funeral ritual among certain Neolithic tribes of different origin, belonging to the Subneolithic Pit-marked Pottery and the Comb-and-Pit-marked Pottery cultures (Wiślański 1979:323, 331) and to earlier and later cultures originating in the Danubian cultural area, namely, the Linear Pottery and the Lengyel (Kulczycka-Leciejewiczowa 1979:94, 162). For example, the burial of a woman bearing in her hands a clay pot filled with ochre belongs to the first of these Danubian cultures. It seems that the custom of dyeing—probably with ochre—mortal remains was practised by certain Neolithic tribes belonging to the orbit of the Corded Ware culture, for instance, the Złota culture (Machnik 1979:382). Among numerous other cultures of the Neolithic, however, there are no hints at all which would point to the presence of dye substances in tombs.

In the Bronze Age and Early Iron Age in Poland, traces of the use of dye substances in funeral ceremonies are almost completely lacking, but in several cremation tombs and in some tombs without skeletal remains of the Lusatian culture there were lumps of ochre and pots filled with red sand (Malinowski 1962:88).

Summing up the above abbreviated sketch of the Polish archaeological record, we can conclude that reddish mineral colouring substances were used by many prehistoric populations, mainly in the Early, Middle, and Late Stone Age. These populations differed considerably in origin and in form of economy. Moreover, there is evidence that dyes were used not only in funeral ritual, but in everyday life. Besides ochre, haematite had marked significance.

Red vegetal dye substances probably played a considerable role in the various customs of prehistoric populations. Of course, their traces are not easy to detect. My supposition in this matter is based on the gromwell (*Lithospermum officinale* L.) remains found near the head of the corpse in a tomb ascribed to the Lengyel culture (Kulczycka-Leciejewiczowa 1979:162–64) and the hawthorn fruits (*Crataegus* sp.) found in several cremation burials of tribes of the Early Iron Age Pomeranian culture (Łuka 1971:72).]

by CLAUDE MASSET

Laboratoire de Préhistoire, Collège de France, Place Marcelin-Berthelot, F-75005 Paris, France. 29 i 80

La plupart des colorants utilisés naguère, que ce soit pour teindre des peaux, de la vannerie, des tissus, pour des peintures corporelles, etc., étaient des extraits de plantes: sucs de baies ou de racines, feuilles, fleurs, écorces, plantes entières, fermentées ou non (à cette liste ajoutons le charbon de bois). Les pigments d'origine animale, comme la pourpre ou la cochenille, étaient moins répandus. Les colorants minéraux étaient eux aussi largement utilisés, mais parfois pour des emplois un peu différents: peinture proprement dite de surfaces rigides (parois rocheuses, maisons), et naturellement céramique. Pour ces usages et bien d'autres, on se servait beaucoup de la gamme des ocres, et de minéraux apparentés comme l'hématite; moins souvent, du noir bioxyde de manganèse et de diverses argiles colorées.

De tous ces colorants, quels sont ceux qu'un archéologue peut espérer retrouver en fouillant? Un bien petit nombre. D'abord, la plupart sont biodégradables. Ensuite, le charbon de bois, par exemple, est trop commun pour qu'un archéologue y voit spontanément autre chose qu'un déchet de combustion; quant au bioxyde de manganèse, il lui ressemble trop pour que nous puissions croire que les fouilleurs d'antan ont toujours

su faire la distinction. La palette de l'art rupestre franco-cantabrique est assez riche, mais de ces pigments à l'utilisation spécialisée, bien peu sont retrouvés dans les sites de sépultures ou d'habitat. Il est vrai qu'ils ont pu être confondus avec les sédiments, ou que des fouilleurs n'en aient pas reconnu l'importance. Restent l'ocre et l'hématite.

Je ne voudrais pas sous-estimer le travail fort intéressant auquel s'est livré Wreschner mais seulement relativiser certaines de ses interprétations. Assurément, l'ocre frappe parfois par son abondance; mais quand, à côté de gisements riches en ocre, d'autres sites d'une même culture préhistorique paraissent ignorer les colorants, il est permis de se demander si nous sommes réellement en présence d'un manque: peut-être s'agissait-il simplement de colorants rouges d'origine organique—ou même d'autres couleurs, également organiques. Il est même possible qu'il ne s'agisse dans ce cas que subsidiairement de couleur: l'ocre peut servir aussi à tanner les peaux (je regrette que Wreschner n'ait pensé à rappeler ce fait). Une autre de ses observations, selon laquelle, au cours de la pré-histoire, les cultures utilisatrices d'ocre étaient minoritaires, pourrait, tout en étant juste, induire le lecteur en erreur. Il ne faudrait pas, sous prétexte que nous ne trouvons pas de colorant dans une fouille, nous imaginer que la culture intéressée faisait peu de cas des couleurs: ce serait perdre de vue le peu de chose que sont les vestiges par rapport à la richesse des réalités défuntes. Pour la même raison, la primauté du rouge risque de n'être qu'une illusion d'optique, n'exprimant que la disparition des autres couleurs. Dans les cultures modernes, écrit l'auteur, le noir, le blanc, le rouge, le vert, le jaune et le bleu jouent un rôle important dans les systèmes de communication et dans la technologie. Il n'y a pas de bonne raison de penser qu'il en ait été autrement à l'époque préhistorique.

[Most of the colorants used in the past, whether for dyeing skins, baskets, and fabrics, for body painting, etc., are extracts of plants: juices of berries or of roots, leaves, flowers, barks, whole plants, fermented or unfermented (charcoal could be added to this list). Pigments of animal origin such as purple or cochineal are less common. Mineral colorants were also widely used, but often for slightly different purposes: for the painting of rigid surfaces (rock or house wall paintings, for instance) and, of course, for ceramic articles. For these purposes and many others, ochres and related minerals such as hematite and, less frequently, black manganese dioxide and various types of coloured clay were used.

Of all these colorants, which ones can an archaeologist expect to find in an excavation site? Very few. First of all, most of them are biodegradable. Secondly, charcoal, for example, is too common for the archaeologist to recognize it immediately as anything other than the product of combustion; as for manganese dioxide, it resembles charcoal so closely that we cannot imagine many past excavators' being able to see the difference. The range of colours in Franco-Cantabrian rupestral art is fairly rich, but not many of the specialized pigments are found in graves or settlements. It is true that they could have been confused with sediments or that the excavators may not have recognized their importance. This leaves ochre and hematite.

I do not wish to underestimate the very interesting work Wreschner has done, but I would like to place some of his interpretations in perspective. Of course, ochre is striking in its abundance; but when we find some sites rich in ochre while other sites of the same prehistoric culture appear to have no colorants at all, we should ask ourselves whether this really reflects a lack in the latter: it may simply reflect the use of red colorants of organic origin—or even the use of other colors, also organic in origin. It is even possible that the question of colour in this case is secondary: ochre can be used to tan leather (I'm sorry Wreschner has not thought to mention this). Another of his observations, namely, that prehistoric cultures

using ochre were few and far between, could, in fact, mislead the reader. We should not imagine, just because we find no colorants in a site, that the culture in question did not attach any importance to colour: this would be to lose sight of the scarcity of the remains in relation to the richness of the past reality. For the same reason, the primacy of red may merely be an optical illusion, simply reflecting the fact that other colours have disappeared. In modern cultures, as the author says, black, white, red, green, yellow, and blue play important roles in communication systems and in technology. There is no reason to believe that the situation was otherwise in prehistoric times.]

by SHERYL F. MILLER

Department of Anthropology, Pitzer College, Claremont, Ca. 91711, U.S.A. 13 III 80

Throughout his discussion, Wreschner slights evidence from sub-Saharan Africa. For example, concerning upper Palaeolithic and more recent times he states, "During most cultural stages—the Magdalenian and the North American Archaic are probably an exception—ochre users have been in the minority." In fact, through a large part of sub-Saharan Africa during the Later Stone Age ochre use has been fairly common. It occurs in many sites of the Nachikufan industrial complex, a cultural manifestation of wooded regions in southeastern Africa lasting in several phases from approximately 18,000 years ago to the past century. Ochre occurs in Nachikufan sites in small lumps, commonly less than 3 cm maximum dimension. Frequently these lumps exhibit signs that the ochre was powdered by rubbing; a flattened face often shows parallel striations from the abrasion of the rubbing stone. Some ochre lumps have several such facets. Stones on which the ochre was processed also occur in Nachikufan sites. It is even possible that some ochre lumps were used as crayons with which to produce designs directly on cave and shelter walls. Nachikufu Cave itself contains a well-preserved specimen, a complex geometric design entirely in red. It is more likely, however, that pigments to be used in this manner were first powdered and then mixed with a binder before being applied to cave walls. Another Later Stone Age cultural complex, the Wilton of southern African savannah regions, is famed for its naturalistic art in polychrome. Ochre and other pigments were used. In contemporaneous sites in eastern Africa, rock art utilizing ochre also occurs in association with Later Stone Age artifacts.

Wreschner devotes his closest attention to uses of ochre associated with mortuary customs. Art, as indicated above, constitutes another important function for such pigments. Wreschner dismisses a further possible use of ochre, body painting, as "of secondary interest." It is true that we have few means of testing hypotheses concerning prehistoric body painting. However, it is perhaps relevant that the abundance of ochre in prehistoric sites generally increases along with archaeological evidence for other forms of personal decoration such as beads and pendants.

by AVRAHAM RONEN

Department of Eretz-Israel Studies, University of Haifa, Mt. Carmel, Haifa 31999, Israel. 7 III 80

The very stimulating problem on which this article touches—the use of red ochre and its biological basis—would also require an account of the reaction to colors of animals endowed with color vision. As it stands, the article consists of citations of anthropologists and ethnographers and a concise worldwide survey of the archaeological record. Some of the information in the survey is misleading. Thus, the number of ochre-bearing sites per period per region ought to be given as a percentage of the sites excavated; also, the definite and clear-cut numbers of

sites are difficult to accept for anyone who knows how dispersed the archaeological information is. Such statistics should be preceded by the qualification "very approximative" (cf. Delporte 1979:214). If the use of red ochre is archaeologically documented only from the late Mousterian, what is the evidence that it was collected in the "early middle" Mousterian? The author suggests that Natufian burials accompanied by red ochre may reflect status differences; why not earlier or later than the Natufian?

The significance of ochre in human mental evolution has not been grasped here. The oldest recorded use of ochre—if accepted—does not imply the oldest categorization. This human trait is attested by any repeated manufacture of stone implements, even the crudest. The characterization of ochre, red or another color, took place within the domain of the spiritual, the nonutilitarian. How does this relate to the knowledge of death? To man's growing perception of his uniqueness? Without these aspects, ochre does not constitute a case for discussion.

by RALPH SOLECKI

Department of Anthropology, Columbia University, New York, N.Y. 10027, U.S.A. 29 I 80

Wreschner is dealing from the outset with one of the most difficult problems in archaeology, that of ideology, compounded by the added difficulty in trying to assess cognitive links across diverse strains of hominids from *Homo erectus* to *H. sapiens neanderthalensis* to *H. sapiens sapiens*. How can a modern gauge for color preference be extrapolated to *H. erectus* preferences? The assumption may be valid, but we'll never know. In any case, now we can be sure that early prehistoric man was not color-blind. Wreschner makes no comment as to what other color materials were available to early man. Admittedly, it is very difficult to determine the range of the color palette from prehistoric sites. The source material for the red ochre and a short review of the mineralogy germane to the theme would be helpful to the nonspecialist reader. How much of the use of red color in burials was independent invention or contact or something else can only be guessed. The occurrences given appear to be without real geographical links. Could it be that the Levantine and North African Palaeolithic and Epi-Palaeolithic groups, which reportedly used red pigments on a much smaller scale than their European counterparts, have simply been deprived of sources of the material? Wreschner is to be commended for tackling a most difficult subject in prehistory, and we are clearly indebted to him for this discussion.

by PETER H. STEPHENSON

Department of Anthropology, University of Victoria, Victoria, B.C., Canada. 22 I 80

This is a very interesting collection of evidence, and Wreschner is to be congratulated for bringing it all together as well as for approaching color symbols as phenomena at the nexus of linguistic, cultural, and biological approaches. Assaying prehistory to clarify these relationships is both ambitious and necessary. Like Wreschner, I agree with Bornstein, Kessen, and Weiskopf (1977) that human beings are "wired" to perceive segmentally the psychophysically distinct chroma (red, yellow, green, and blue). Macaques have been used to study the neurological underpinnings of color response because their hue-discrimination curves are nearly identical to those of humans. This research reveals that within the lateral geniculate nucleus cells respond to wavelengths differentially: the most generalized response is to brightness, and particular cells change (either increase or decrease) rates of firing when exposed to red, green, yellow, or blue (Devalois, Abramov, and Jacobs 1966). Because the atmosphere is saturated with long wavelength light at dawn and dusk (Herzberg 1965), species moving

from nocturnal through crepuscular and into diurnal habitats would be exposed to increasing frequencies of light. Herein, I have suggested (Stephenson 1973a), lies the basis for the differential salience of colors: black/white > red > yellow > green > blue. Thus it is *change* in color which from the very outset has served to establish the basis for both perception and meaning (Stephenson 1979a). The changes at dawn, of ripening, bleeding, molting, etc., are a few examples. In this respect I would suggest that change from bright (oxygenated) red blood to the earthy brown of coagulated blood is naturally associated with danger and death. The change from a dull lustre to bright red during firing or with the addition of liquid might likewise represent life. The reversal (to red or from red with brown) implies the life-death dichotomy.

Symbols which change their referent when social contexts are altered are termed multivocal by Turner (1967). Red may represent one of the earliest multivocal symbols. Interestingly, when I compared the level of abstraction of color symbols (multivocal or unireferential) with their respective levels of abstraction in language (basic term or metonym) for five cultures with different-sized color vocabularies, I discovered an almost exact correspondence (Stephenson 1973b). Only colors which were basic terms were also used multivocally in the cultural domain. In metonymic situations, the meaning of the symbol was limited to the meaning of the word used to describe it. I should also note that one society which intentionally eschewed the use of most color symbols as idolatrous (the Hutterites) sustained the use of red to represent blood and to imply life and death (Stephenson 1979b).

The transition from limited to widespread utilization of ochre which Wreschner documents may be a useful yardstick for studying the elaboration of language. Unlike flowers, shells, etc., whose colors may have been important but are likely to have been metonymic, ochre was mined, traded, refined, and used in multiple contexts. Thus the tempting speculation arises that Neanderthals spoke and may have even had a basic color term for red.

A few caveats: (1) The degree of consensus as to the meaning of red on flags may reflect more the meaning of flags than the meaning of their constituent colors. (2) The fact that a body is buried in ochre does not logically mean that the ochre was applied at death. For all we know, people may have painted themselves while they were alive and merely buried the dead as they were. Bowls of ochre could merely represent future supplies of body paint for the afterworld. (3) Neanderthals needn't have spoken; they doubtless communicated, but sign language might have been used (see Hewes 1973; Stephenson 1974, 1979c).

by LYNN L. THOMAS

Department of Sociology and Anthropology, Pomona College, Claremont, Ca. 91711, U.S.A. 7 III 80

In his interesting and useful discussion, Wreschner does not minimize the problems of inference and interpretation involved in trying to understand the nature and roles of prehistoric ochre use, but more clarification of two issues may be possible.

First, Wreschner mentions the rarity (save in the Magdalenian and North American Archaic) and uneven archeological evidence of ochre. Do the inferential problems concerning evidence of use and dating preclude distributional analyses (e.g., distribution in space and time, analysis of association with other artifacts)? Wreschner gives the impression that either the evidence does not warrant much of such analysis or he is not very much interested in doing it. Are the data just too few? Are there no patterns?

Second, can the concepts concerning cognition, perception, use, and symbolic attribution be sharpened? For example, with regard to the two lumps of red ochre found in BKII at Olduvai,

Wreschner argues that “we are here confronted with evidence of a social action probably stimulated by the capacity for color categorization.” He then asks: “Do we have here the first evidence of a capacity for perceptive color categorization?” He seems to answer the question affirmatively. What seems problematical here is the placing of significance on perceptual categorization per se, however specified (the sociology of the ochre use is another matter). For one thing, it is highly likely that bare perceptual abilities in regard to reddish colors long preceded BKII at Olduvai in hominid phylogenesis. This notion should be indirectly testable in the case of nonhuman primates (cf. Kay and McDaniel 1978). What seems more at issue—and the more interesting question—concerns the patterns of uses and the involvement of cognitive (and social) constructions in uses, whether our concern is with significant discontinuities or continuities in human evolution or with panspecific or variable patterning, say, in the later part of the record. The associations of reddish ochre with mortuary customs and the inferences concerning meanings (e.g., those involving life and death, blood and danger), even if not early attestations of “color preference,” are the more interesting. What sorts, then, of cognitive and social capacities underlie such specific constructions of meaning? Constancies in perception may well be involved; categorization and recognition are certainly involved (and the latter would seem, in Wreschner’s usage, to be implied by the former). But how, and in relation to what? Do the ochre colors have the meanings attributed to them, either originally or after the fact, in a given setting because of the similarities to other colors, e.g., that of blood? Or do they have these attributes because of particular hue-saturation-brightness values? Are there interactive or additive effects of these? One lead is provided by Berlin and Kay, Sahlins, and D’Andrade and Egan. Sahlins argues that the strong cross-cultural regularities in attributions of *foci* of the basic color categories of Berlin and Kay are understandable on the basis of saturation, given hue. D’Andrade and Egan notice that “the emotional associations usually found with ‘color’ do not seem to be due primarily to the actual hue, or light wavelength, involved but to the degree of saturation and brightness” (1974:62). In the light of the Berlin and Kay arguments and evidence to the effect that there is considerable cross- as well as intracultural variation in *nonfocal* attributions (see also Kay and McDaniel 1978), the question becomes, first, What are the ranges of the ochre and ochre-derived colors, especially brightness and saturation (and controlling for effects of wear-and-tear on the archeological specimens)? Then, are the ochre meanings to be interpreted as associated with “redness” per se (which perceptual aspects thereof?), and, if so, is it focal red, or do the ochre reds “call to mind” focal red, or is it saturation and brightness alone? Or are the ochre meanings to be interpreted as associated with other aspects of ochre color or material (e.g., texture?) or such things as salience in the environment and similarity to the color of blood?

Such questions as these might lead Wreschner to reconsider the appropriateness of his dismissal of Sahlins, who does indeed espouse a relational—but not merely relational—point of view. However the above questions are answered, it becomes clear that the dismissal of Sahlins is neither implied nor particularly suggested by Wreschner’s evidence and arguments. The questions also require our asking if we have here to do with biology being purely and simply “at the root of human color behavior” or rather with relatively complex constructions of reality (apologies to Berger and Luckmann 1966) which may (or may not) be similar because of the modes of manipulation and the concerns of the attributors of meaning. The same sorts of questions, it would seem, need to be asked concerning notions of death, danger, and the like. But, as D’Andrade and Egan put it, a metaphoric darkness descends, a darkness in this case compounded by antiquity.

by HEINRICH ZOLLINGER

Eigenössische Technische Hochschule, 8092 Zürich, Switzerland. 19 II 80

As Wreschner has noted, Berlin and Kay (1969) have demonstrated clearly in a cross-cultural linguistic study that the simplest color lexicon contains words for black and white only. A word for red is then added, followed by words for yellow, green, blue, etc. With the help of color-naming tests, we have shown (von Wattenwyl and Zollinger 1979, Zollinger 1979, and earlier papers) that this sequence is related to a neurobiological basis, namely, Hering’s opponent-color scheme. This scheme predicts, however, only the dominance of black, white, red, yellow, green, and blue relative to other hues, not their sequence. A linguistic basis for the color sequence can be found in Jakobson (1968 [1941]), as I have recently pointed out (1979). Jakobson showed that the development of language in the child takes place in a regular sequence; he also recognized close relationships between speech sounds and color perception, arguing that sounds are chromatic in different degrees, *a*, for example, being most chromatic among the vowels and least affected by the light-dark opposition. That sounds are psychologically related to the perception of color had already been recognized early in this century, e.g., by Köhler and Stumpf, but the specific recognition that the development of sounds parallels that of colors is Jakobson’s: *a* as the primary chromatic vowel is symbolized by *red*, as various analyses of psychological sensations have demonstrated. My correlation of Jakobson’s ontogenetic investigation of child language with the cross-cultural linguistic results of Berlin and Kay on color terms fits well into Wreschner’s phylogenetic discussion of the role of red ochre in human evolution.

It may be added that Williams’s (1976) investigation of the metaphorical use of adjectives related to the five senses parallels the biological evolution of the senses, i.e., their phylogenetic development in animals and man, the visual and acoustic senses being the most highly developed (see Zollinger 1979). This allows an—admittedly speculative—extrapolation to periods even earlier than 500,000 years ago.

Reply

by ERNST E. WRESCHNER

Haiifa, Israel. 2 v 80

It is encouraging to observe that the responses to my short paper open a first round in an interdisciplinary critical appraisal of red color finds in archaeological contexts. The similar questions raised and the similar suggestions concerning the validity of the archaeological evidence and the role of colors other than red in past human behavior illustrate the need for a methodological approach to the topic and an understanding of its inherent objective limitations. It must be stressed that it is the color red that is the focus of my discussion, and here it becomes quite obvious that the term “ochre” can be misleading. I therefore find Butzer’s observations important. While reflecting an understandable hesitation to elaborate on the implications of red color materials in early Palaeolithic sites (the presence of which is an archaeological fact), they tend to throw out the baby with the bath. I agree that “ochre” is not a satisfying or accurate term for a variety of red-colored materials of mineral origin. What is important, however, is their intentional collection because of their color. Whether red-colored minerals were collected by early human beings out of curiosity, whether their properties were discovered by chance, whether the use of red pigment was invented at different times in different places by different peoples or diffused by contact, it seems that the color attracted man because it could be endowed with meaning. Therefore finds of red objects, whether archaeologists have termed them ochre or not, are fossil

indicators of human behavior whenever their intentional collection can be established. A reddish siltstone "collected for curiosity purposes," as Butzer concedes, is therefore no less significant than the 75 pieces of partly or thoroughly fired limonite reported by de Lumley at Terra Amata or the red pigments from later prehistoric sites that he does acknowledge. Further, though Howell may have mistaken a natural fracture on the reddish siltstone at Ambrona for an indication of probable rubbing, it is the presence of the siltstone and its find circumstances that are important. The same criteria apply to Castillo and the sub-Saharan Middle Stone Age sites. The frequency of red pigments in the latter may have a bearing on the claims for the antiquity of hematite and specularite mining in Swaziland reported by Boshier and Beaumont (1972) and Beaumont, de Villiers, and Vogel (1978). Beaumont has informed me of the pronounced scarcity of colorants in the Acheulian sites preceding those of the Middle Stone Age. To accept the intentional presence of ochre in later prehistoric sites only and to conclude that "perhaps a majority of the claims for ochre in particular archaeological associations are inconclusive or simply wrong" is a position that has yet to be justified.

Delporte advocates the gathering of "objective information," and I agree. Controlled experiments with ferruginated shales, sandstones, and sesquioxide-rich clays should be performed to find out if these materials yield results similar to those of water-dissolved or fat-mixed powdered hematite and fired limonite, which produce, according to my experience, a smooth, homogeneous paste that adheres well to wood, bone, and skin. Relevant pioneering work has been done by Couraud and Laming-Emperaire (1979) with colorants of mineral origin used in Palaeolithic rock art. We need to learn more about the behavior of red mineral pigments under the influence of percolating water in subsoils and about the influence of ochre-stained soils and the extent of their responsibility for staining artifacts and bones. We need to know more about the causes of the red coloring on the edges of flint tools and the red traces on stone and bone left by ochre-related human activities. I am currently engaged in some experiments of this sort, and I hope that other appropriate studies will soon be undertaken. One relevant examination of color traces on Magdalenian scrapers is that of Rosenfeld (1972).

Now to the question of other than red pigments in archaeological contexts: To my knowledge, manganese oxide has been found in Mousterian and later levels. Apart from its occurrence in rock art, we have no indications of its probable use. Charcoal might have served to produce black coloring, but this can hardly be determined. Lumps of white clay foreign to the site have been retrieved from an Aurignacian layer at Hayonim Cave in Israel, a layer rich in red ochre pieces and ochre-coated grinding stones and palettes. Green malachite and antimony (black) are known from Dynastic strata and supposed to have been used for cosmetic purposes.

The ochre-derived color shades are dull red tending to reddish-brown, the color of dried or coagulated blood, whereas cinnabar (mercury sulfide) produces a bright red very much like the color of fresh blood. Cinnabar appears in mortuary customs and in the painting of shrines in later Neolithic contexts only, and the earliest evidence for cinnabar mining comes from the late Neolithic. Evidence for plant-derived and perishable red colorants is lacking in prehistoric sites.

The examination of red in its relationships with other colors recommended by Bolton and Jacobson-Widding cannot be undertaken on the basis of archaeological evidence. Archaeology cannot provide the means to reconstruct color relationships in past symbolic structures as ethnography does in present ones. However, archaeology may be able to reveal the linkage of various structural elements in ochre-related ritual and symbolism as early as the late Middle Palaeolithic. The similarity and persistence of such elements as shells, animal teeth, and

incisions on bone and stone are astonishing. Utterances and movements, an integral structural part of ancient ritual and symbolism, remain forever hidden. I believe that the salience of red for man and the pattern and scope of its persistence can and should be observed through a diachronic approach to their synchronic manifestations in the archaeological contexts—something like a chronological-stratigraphic recording of red color phenomena, which enables us to observe regularities in specific situations. Ethnography thus constitutes the "youngest level" and cannot be ignored as Delporte thinks it should.

The questions formulated by Thomas are of prime importance for a discussion of ochre practices. I do not, as he reports, dismiss Sahlins; I simply object to Sahlins's conclusion that recognizing plays no role at all. Thomas argues that Sahlins's point of view is "not merely relational." I agree that this can be observed in his reasoning, but this makes his conclusion all the more questionable. I interpret the evidence as pointing to an interaction of recognizing and relating.

It is known that primates have color vision. Identifying an orange or red fruit or other feature against a not monochromatic background can be seen as of selective value. Reactions to hue, brightness, and saturation may have become decisive for categorisation and relating, as Stephenson's and Zollinger's contributions indicate.

The wealth of ideas offered by Bolton and his intriguing reasoning on relevant aspects of ochre practices make his response a valuable complementary paper for discussion. I cannot do justice to it here, but I would like to make a few remarks on his observations on the use of red ochre in the context of death. Of course, we cannot know what specific beliefs were involved in the use of red ochre in the mortuary customs of ancient hunters, pastoralists, and farmers. We call them primitive religion and, out of some deep compulsion, speculate about their origins. Ochre practices might be interpreted as a defiance of death. For these ancient humans, however, death was perhaps or probably not the "ultimate fact," but a transformation or transfiguration to another state, another reality. Red may have been conceived as containing the power (or being the power) of ensuring life. In many primitive societies, red ochre and red things are conceived as powerful medicines against disease and death, but they are equally thought effective in ensuring life after death. (Those opposed to the citation of ethnographic examples will, I hope, forgive me for this remark.) We moderns find it difficult, but not impossible, to construct and to accept other realities. Playing "as if" is not confined to children. In substantial numbers, modern humanity still does not accept the ultimate fact of death as nonexistence.

To speak of "man's growing perception of his uniqueness" in connection with ochre, as Ronen does, is inappropriate. I notice also that his conclusion that I have failed to grasp the significance of ochre in human mental evolution is not shared by the other commentators.

Finally, I did not claim that the numbers of sites in my paper were definite and accounted for all the known ochre finds. I am therefore grateful to Häusler and Malinowski for their additional information and references. Such information is needed for the further studies that I hope will be undertaken as a result of our discussion.

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Indigenous Anthropology in Non-Western Countries: A Further Elaboration¹

by HUSSEIN FAHIM and KATHERINE HELMER

Department of Anthropology, University of Utah, Salt Lake City, Utah 84112/Department of Anthropology, State University of New York, Binghamton, N.Y. 13902, U.S.A. 6 x 79

[we] have to remind ourselves that anthropology does not merely apprehend the world in which it is located, but the world also determines how anthropology will apprehend it.

TALAL ASAD, *Anthropology and the Colonial Encounter*

In response to a preliminary statement of intention from the organizer and a letter of invitation from the sponsor, the Wenner-Gren Foundation for Anthropological Research, 20 participants from 17 countries² met at Burg Wartenstein, Austria, July 15-24, 1978, to present papers and discuss issues related to indigenous anthropology in non-Western countries. The term "indigenous anthropology" was proposed as a working concept referring to the practice of anthropology in one's native country, society, and/or ethnic group. The label "non-Western" was conceived as appropriate for the purpose of this symposium because anthropology had originated and developed in a Western intellectual, economic, and political milieu and the increasing number of anthropologists trained and operating outside this tradition has raised new issues within the discipline.

¹ © 1980 by The Wenner-Gren Foundation for Anthropological Research 0011-3204/80/2105-0002\$02.00. These comments expand on a brief report of the conference published in CA 20:397.

² The conference was the result of the initiative and cooperation of many individuals. The selection of participants was guided by a concern for a wide range of regional representation, academic training, intellectual perspectives, and age. Four participants came from the fields of sociology, psychology, and linguistics. A graduate student served as rapporteur. The participants and their institutional affiliations are as follows: Soraya Altorki (American University in Cairo), John Barnes (Churchill College, Cambridge), Michael Cernea (World Bank), Yehudi Cohen (Rutgers), Elizabeth Colson (University of California, Berkeley), Jean Cuisenier (Musée National des Arts et Traditions Populaires), Hussein Fahim (University of Utah), Epeli Hau'ofa (Nuku'alofa, Tonga), Katherine Helmer (State University of New York, Binghamton), Mubanga E. Kashoki (University of Zambia, Ndola Campus), Herbert C. Kelman (Harvard), Koentjaraningrat (Komplex Universitas Indonesia), T. N. Madan (Institute of Economic Growth, Delhi), Luiz R. B. Mott (Universidade Estadual de Campinas), Nader Afshar Naderi (Iranian Institute for Peasant and Rural Studies), Chie Nakane (University of Tokyo), Carlos Buitrago Ortiz (University of Puerto Rico), Lita Osmundsen (Wenner-Gren Foundation for Anthropological Research), Robert Petersen (Institute for Eskimology, Denmark), Gunnar Sorbo (University of Bergen), and Arturo Warman (University of Mexico). The participants extend their gratitude to Lita Osmundsen and the entire castle staff, in particular the director, Karl Frey, and the symposium secretary, Kristina Baena.

Several recent developments have made the exploration of this theme timely. Many of the countries that previously constituted favorable settings for Western anthropologists' fieldwork have become politically sensitive developing nations. As a result, they have set restrictions on foreign anthropological research, while vigorously encouraging indigenous anthropologists to conduct research relevant to nationally defined developmental goals. Expanding cadres of local social scientists are currently conducting fieldwork "untainted" by nationalist accusations of imperialist and colonial connections. Some speak of "decolonializing" anthropology (Maquet 1964, Stavenhagen 1971), while others are developing new concepts and methodologies for the practice of indigenous research (Nash 1975, Fahim 1976).

Parallel to the growth of indigenous anthropology in the Third World, many Western anthropologists, especially in the United States, are turning to domestic social interests and problems. While this trend may be seen as a way of coping with the difficulties of overseas research, unfavorable domestic job markets, and tight academic research budgets, there is a lively and creative indigenous anthropology developing in the United States (e.g., Spradley 1970, Arens and Montague 1976). "Already we have some foreshadowing of the advances that may take place when anthropologists who have worked in other countries turn their thinking to our large-scale American and European societies and their associated institutions" (Colson 1976:268).

In this period of rethinking, reviving, and reassessing anthropology, the discipline has recently begun to examine the fieldwork process and to question results on the basis of methods and techniques. Anthropologists in the United States, for instance, are publishing accounts of their fieldwork experience and procedures (e.g., Freilich 1970, Wax 1971, Foster and Kemper 1974). The experiences of non-Western anthropologists, however, remain to be adequately investigated. Third World anthropologists must be given an equal opportunity to report on the state of anthropology and fieldwork experiences within their local settings.

Many argue that the fundamental premises of the anthropological enterprise are, or should be, the same regardless of the identity of the researcher or the locus of investigation. Nonetheless, the underlying assumption in this working concept of "indigenous anthropology" is that a change in the actor (i.e., local in lieu of foreign) implies a change in the anthropologist's role and perspective. Methodologies may change from one setting to another, but anthropology in Third World countries may also require a "set of theories based on non-Western precepts and assumptions in the same sense that modern anthropology is based on and has supported Western beliefs and values" (Jones 1970:251). The concept of native anthropology, as proposed by Jones, clearly identifies the re-