

GESTURE AND SIGN LANGUAGE; READING THE ROCK ART

In this paper, I argue that anthropomorphic figures in the selected rock art panels are used to communicate through a reference to body language, or non-verbal communication. The nonverbal communication systems, gesture, posture, and proxemic behavior are of special interest here. Signed languages are considered to be a more structured gestural communication system. It has been argued by Armstrong, Stoke and Wilcox (1995), Armstrong (1999), and Corballis (1991:1999) that the development of human language originated with gestured signs. They point out that even in cultures with highly developed spoken languages, people still use gestural signs to augment speech. Nonverbal communication is common to all humans. It begs the question as to whether depictions of anthropomorphic figures in rock art portray aspects of this kind of communication in a structured and understandable way.

HISTORY OF THE RESEARCH OF GESTURE

From the time of the Renaissance, studies of gesture have been made by many observers. Francis Bacon, for example, believed gestures were like 'transitory hieroglyphics', and 'a kind of emblem'. Giovanni Bonifacio and John Bulwer believed there was a universal, natural language of gesture which was understood by all nations and could be used to facilitate the conduct of international trade between European and native peoples (Thomas 1991). Charles Darwin was probably the first scholar to write about nonverbal communication. In *Expressions of the Emotions in Man and Animals* (1872), he describes animal and human body motions that he thought communicated information. Researchers of animal nonverbal communication have described the signals given by dogs, monkeys, chimps, horses, etc. that show a similarity in

communication using facial/ear/eye/mouth expressions with those that humans also use to communicate information and emotions. Body posture is especially important in the animal kingdom although it is not considered a language per se, but rather, a set of *signals* that trigger responses in other animals (Argyle 1975). Animal communication is very often unconscious. The signals that a dog picks up at scent-marked posts or curbs may cause the back hairs to rise or bristle, or the tail to wag in response. The dog is not consciously trying to send a message, but rather responding to signals unconsciously. Whether conscious or not, the dog is still decoding information in the form of signs and responding with encoded body communication that a witness, be it a dog or human, could interpret. Animal signals are interpreted by human societies which are in constant interaction with animal life. People of hunting societies depend upon their ability to "read" or interpret animal behavior in order to understand what is being communicated in their environment. The signals given by animals are, for the most part, innate. They have evolved through time into social signals that are specific to each species. The human uses of signals are both innate and culturally constructed forms of nonverbal communication.

Boas (1921) described the body language of the Kwakiutl, Northwest Coast Indians who walked and danced in ways foreign to Europeans. Boas was able to use motion picture film to record Kwakiutl oral histories, songs and animated gestures that referred to characters in their mythology. With his early films he analyzed film footage frame by frame to compare body postures and gestures. One of his students, Edward Sapir (1931), proposed that successful communication depended upon coded information that had to be learned. David Efron (1941), another of Boas'

students, studied the cultural relativity of gestures and body language among the south-eastern European, Jewish and Italian communities. A psychological approach was applied by Weston LaBarre (1947), who described nonverbal communication as a 'pseudo language' that was inseparable from vocal language.

Research has shown that gesture is not a universal language but is a socio-cultural construct that is not mutually intelligible by people of different cultural affiliations. Studies by social scientists, linguists and anthropologists have shown how gestures vary from culture to culture (Kendon 1981). Students working in the field invariably learn the meanings of gestures so as not to offend the host, nor miss out on important information. LaBarre gives examples such as hissing in Japan as a polite deference to social superiors; the Basuto applaud by hissing whereas in England it is rude and is meant as an insult. Spitting in many parts of the world is a sign of contempt, yet among the Masai of Africa it is a sign of affection and benediction. The spitting of an American Indian medicine man upon a patient is a curing device (LaBarre 1947).

Are there 'innate' gestures that are common to all human beings? It cannot be assumed that simple gestures like head nodding mean "yes" and turning from side to side means "no." Holt (1931) believed that the motions of "yes" stemmed from an infant seeking its mother's breast, and the avoidance motion of 'no' was refusal of the breast. But there are many exceptions when looking at this simple gesture, as demonstrated by LaBarre (1947) who calls this a "sub-linguistic" gesture language that is marked by cultural variances. Cross-cultural studies of human societies have shown that some aspects of nonverbal communication have similarities in all cultures. But others, for example symbolic gestures, vary greatly from culture to culture. The differences stem from cultural conditioning

rather than biological 'hard-wiring' of the brain.

Theory of Gesture

Anthropologically speaking, all cultures 'communicate' through gestures, whether consciously or subconsciously. Linguists believe that gestures accompany spoken languages for nearly all cultures of the world. In some instances, a formal sign language has been retained, especially with hunter/gatherer tribes in Australia, Africa, Asia and North America (Umiker-Sebeok and T. Sebeok (eds). 1978). These sign languages are culture specific and require a knowledge of the culture to interpret, but there are a few universal signs common to the biological properties of all humans. They can be interpreted cross culturally and the meaning is self-evident.

Gesture is treated as a functional unit by Armstrong (1999, 46) "an equivalence class of coordinated movements that achieve some end." Morris (1994) argues that there are both conscious and unconscious gestures that are recognised as cultural communications even though we are unaware of making some of them. According to Armstrong symbolic gestures have three kinds of structures; conceptual, neuromuscular and symbolic. Gestures are bipolar; that is they are meaningful as an action and as a concept. It is this status that gives them their communication capacity (Armstrong 1999).

Efron (1941) investigated whether gestures were culturally determined, and through his studies demonstrated how immigrant Italians and eastern European Jews changed their gestural habits as they became assimilated into American society. He categorized gestural movements as meaningful units that either accompany speech or add pictorial and symbolic information. A gesture is meaningful, first, by the emphasis it lends to the content of the verbal and vocal behaviour it accompanies. Second, by the connotation it

possesses independently from speech of which it may, or may not, be an adjunct (Efron 1941). The first kind may be “baton-like” representing a sort of “timing out” with the hand the successive stages of the referential activity, or ideographic, in the sense that it traces or sketches out in the air the ‘paths’ and directions’ of the thought-pattern (Efron 1941). These categories may be further broken down into (a) deictic, referring by means of a sign to a visually present object (actual pointing), (b) physiographic, depicting either the form of a visual object or a spatial relationship (iconographic gesture), or that of a bodily action (kinetographic gesture), and (c) symbolic or emblematic, representing either a visual or a logical object by means of a pictorial or a non-pictorial form which has no morphological relationship to the thing represented (Efron 1941, 96). Efron was followed by McNeill (1992), and more recently Armstrong (1999), in describing the components of gestural systems of communication. The debate continues as to whether gestures conform to the definition of ‘language’ or should be considered as a structured communication system unique in itself.

The Difference Between Gestures and Signed Language

McNeill (1992) argues that there is a clear difference between gestures and signed languages. Gestures do not convey meaning in the same way as a signed language or a spoken language that segments and delineates meaning. Gestures are instantaneous with the thought process while sentences composed of words, necessarily, have a temporal component. The process of segmentation and linearization to form a hierarchy are essential characteristics of all linguistic systems, including signed languages. According to McNeill, “gestures are different in every way. They are multidimensional and present meaning complexes without undergoing segmentation or linearization. Gestures are global and synthetic and never hierarchical”

(McNeill 1992, 19). Gestures are closely linked with speech but have characteristics of their own that are different from spoken language.

Armstrong (1999) argues that the differences between signed language and spoken language can be traced back to the differences in the capacities of the brain’s methods of perceptions. “The human brain has a much greater sensory acuity in the visual medium making, and this makes possible the use in signed languages of icons to a degree not possible for spoken languages” (Armstrong 1999, 19). He agrees with McNeill that signed languages are lineal constructs, but believes they communicate many bits of information simultaneously, like gestures (Armstrong 1999).

Structure of American Sign Language and Aboriginal Sign Languages

Stokoe (1960; 1972) approached American Sign Language (ASL) as a semiotic system and worked out the three major characteristics he called First Articulation, Second Articulation and Syntax of ASL. The main units of meaning were termed *signs* and *gSigns* (gestural signs). He characterised them as *emic* units of ASL in contrast to the *etic* units of sign language which he defined as gestures. Using the linguistic model he defined the non-signifying differential units of gestural signs as *cheremes* (Stokoe 1972). In contrast to phonemes (units of meaning in spoken language), cheremes are not elements in a sequence, but signed simultaneously as components of a gestural sign. These elementary components are termed 1) *dez* (designator), the acting (handshape) configuration, 2) *sig* (signation), the performed movement, and 3) *tab* (tabula), the location of the action. Stokoe was able to identify fifty-five cheremes (12 tab, 19 dez, and 24 sig) and describe the ASL lexicon of about twenty-five hundred signs (Stokoe et al. 1965).

Klima and Bellugi (1979), have developed this system further using chereimic analysis to show distinctions in the features of hand shape such as 'dual,' 'radical,' 'touch,' and 'cross.' They demonstrate the relationship of time and space by the proxemial positioning of the signing, 'in front'(future), 'beside'(present), and 'behind'(past) the head (see Figure 1).

Australian Aboriginal and Plains Indian Sign Languages have been studied in detail and both differ from ASL in their communicative functions. Plains Indian sign language (PSL) has a higher degree of iconic and indexical motivation (Umiker-Sebeok and Sebeok 1978) and is a universal language because of its use to communicate between speakers of different languages (Mallery 1881). In contrast, Aboriginal sign languages are used for communication within a group, in circumstances when speech is not possible, as during hunting and in ceremonies when language taboo has to be observed (Kendon 1988).

The Function of Gesture as Narrative

McNeill (1992) describes gestures as part of a narratological structure allowing them to embody specific information about the discourse structure. Figure 2 shows the different channels or modules of communication during a narrative, or performance (Armstrong 1975).

The narratological structure of gesture can be diagrammed to show each branch leading to a specific type of gesture according to McNeill (1992).

McNeill gives a schematic illustration of how gesture and narration work in combination to produce what is considered human language. He writes:

Gestures have relationships in storytelling, they mark various elements of story; that is, they participate in the depiction of action, person, space, and time (narrative events);

and gestures participate in the articulation of the discourse (metanarrative and paranarrative events): that is, the role of gestures in narrative phenomena such as voice, perspective, order, etc., that take a given set of abstract story components and realise them in a particular way in a particular story (McNeill 1992:189).

For the purposes of this paper, I regard gestures as one channel of the multi-channelled phenomena of human language. Like Armstrong et al. (1995), Armstrong (1999) and Wilkins (2001). McNeill believes gestures and spoken language are parts of a single system. Language is more than just words because "images and speech are equal and simultaneously present in the process of the mind" (McNeill 1992, 2). He gives evidence from childhood development studies that speech and gesture develop in parallel, which demonstrates that they are both components of a single system (McNeill 1992). Gestural communication requires a different model for studying its structure and its relationship to other modes of language. The misconceptions around gesture have led linguists to study it in terms of spoken language "as a system for translating the hierarchically organised contents of the mind into linear strings of arbitrary symbols" (Armstrong 1999, 5). To correct this, McNeill has provided an understanding of gestural constructs in terms of 'global and synthetic' terms, rather than within the framework of linguistic analysis (McNeill 1992).

Figure 3 illustrates gestures and postures that are easily identified by people of Western European cultures, and figure 4 is a clue to the era in which terms like "affected" were used. The generation of the 21st Century probably would not identify some of these gestures and postures in the same manner. But the dynamism of gestures in conveying meaning, whatever it is, remains unchanged through time.

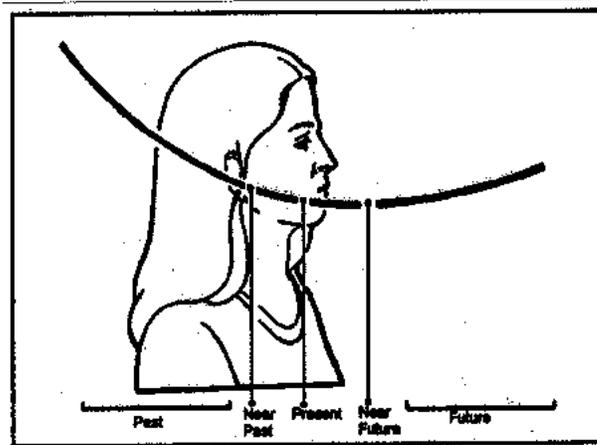


Figure 1 Proximal positioning of signing for future, present and past. (From Klima and Bellugi 1979).

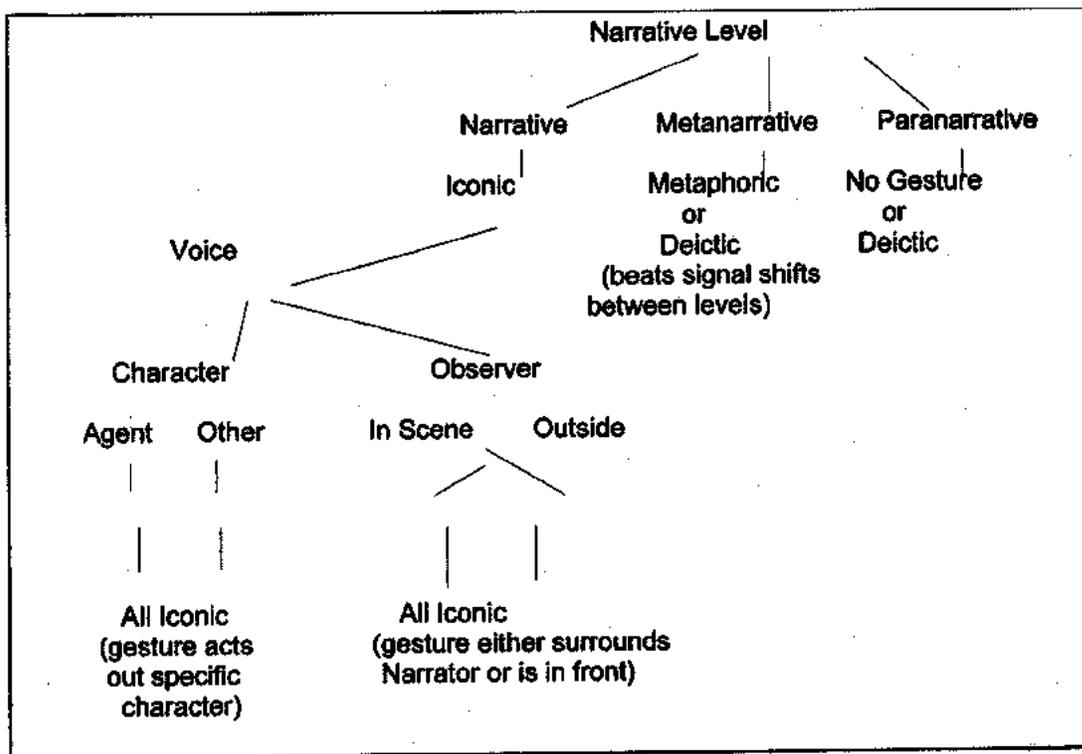


Figure 2. Narratological structure of gesture. As shown each branch leads to a specific type of gesture that is the gesture for that combination of narratological features according to McNeill (1992).

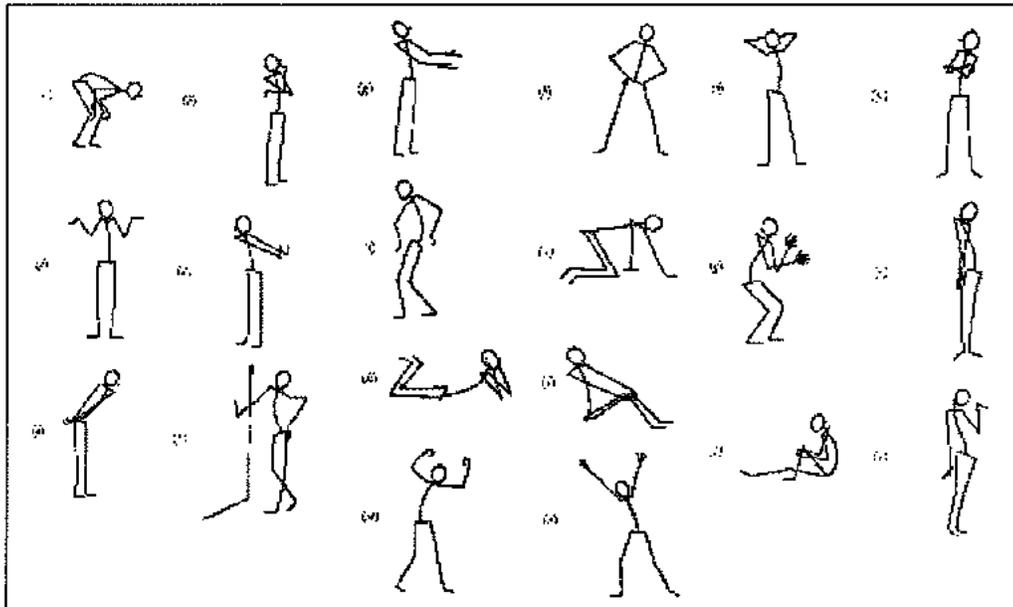


Figure 3, Gestures and postures interpreted as : *a* curious, *b* puzzled, *c* indifferent, *d* rejecting, *e* watching, *f* self-satisfied, *g* welcoming, *h* determined, *i* stealthy, *j* searching, *k* watching, *l* attentive, *m* violent anger, *n* excited, *o* stretching, *p* surprised, dominating, suspicious, *q* sneaking, *r* shy, *s* thinking, *t* affected, (gay). (illustrations from Sarbin and Hardyk, 1953 reproduced in Argyle 1975, 273).

Gesture and Mental Imagery

Recent work by McNeill (1992) examines gesture in its revelation of the idiosyncratic imagery of thought and argues that gestures are an integral part of language as much as are words, phrases and sentences. He states that "Gestures are not just reflected thought but have impacts on thought and are what help to constitute thought. Gestures occur because they are part of the speaker's ongoing thought process" (McNeill 1992, 245).

It has been suggested that gestures - not words - are the medium of thought. Not all people think in words. Mathematicians have stated that they think in other symbol systems. Einstein professed that:

The words or the language, as they are written or spoken, do not play any role in my

mechanism of thought. The psychical entities which seem to serve as elements in thought are certain signs and more or less clear images which can be 'voluntarily' reproduced and combined. The above mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for labouriously in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will (Einstein, quoted in Hadamard 1945:142-143).

In trying to find the "inner voice" that transmits thought. Klima and Bellugi (1979) have interviewed deaf people who have never heard spoken words. They report that deaf people dream in signs and plan conversations in signs. Armstrong argues that if gesture, instead of speech, was the basis of graphic

communication we would have something like ideograms as writing.

This writing system would not evolve into an alphabetic system – in its latest stages, it might be something like the writing system of modern Chinese . . . (A)n ideographic (actually logographic) writing system has proved adequate to the needs of the Chinese, one of the worlds' most complex societies, through many centuries (Armstrong 1999, 76).

The value of ideographic writing is that it transcends different languages. China has many different language groups that make it difficult to use a phonetic writing system. A pictographic system communicates the same information in different languages. It can be *read* cross-linguistically.

Categories of Gesture

McNeill's (1992) classification of gestural categories is useful and is summarised below:

Iconic - a gesture that bears a close formal relationship to the semantic content of speech. Iconic gesture display in its form and manner of execution, aspects of the same scene that speech also presents.

Metaphoric - gestures are similar to iconics in that they present imagery, but present an image of an abstract concept, such as knowledge, language, itself, the genre of the narrative. More complex than iconics. A metaphoric gesture must depict two things, the Base which is the concrete entity or action that is actually presented in the gesture, and the Referent, which is the concept.

Deictic - gestures are pointing movements, which are prototypically performed with the pointing finger, although any object or body part can be used.

Beats - are defined as movements that do not present a discernible meaning, but can be recognised by their prototypical movement characteristics (McNeill 1992: 80).

Table 1, (McNeill 1992:76) shows four gesture classification schemes that have been

proposed. It compares McNeill (1992) with earlier versions from Efron (1941), Freedman and Hoffman (1967) and Ekman and Friesen (1969).

Like Armstrong (1999) and Corballis (1999), McNeill believes that:

speech and gesture are elements of a single integrated process of utterance formation in which there is a synthesis of opposite modes of thought - global-synthetic and instantaneous imagery with linear-segmented temporally extended verbalization. Utterances and thoughts realised in them are both imagery and language (McNeill 1992: 33).

Is it possible, therefore, to do any more than identify possible gestures in prehistoric art, knowing it is without cultural context and accompanying verbal dialogue? In the Western media, talented photographers are aware of the absence of spoken language and compensate by capturing gestures that supply to the viewer the information missing from a vocal dialogue. Paintings of the Western European tradition are characteristic of employing gesture in their human (and animal) figures that communicate meaning beyond the necessity for a title or supplied story. Silent movies of the 1920s and 1930s were brilliant at conveying a story with minimal textual dialogue. The humour of Charlie Chaplin and the famous mime artist, Marcel Marceau are prime examples of gestural communication without speech. Mental images can be created and "meanings" communicated without the accompaniment of text or verbal dialogue.

Cultural Studies of Postures

Early studies of postural habits of different cultural groups include those carried out by Mauss (1935), Bailey (1942) and Mead and Macgregor (1951). Kroeber claimed that posture "is one of the most interesting matters in the whole range of customs "(Kroeber 1925, 728). Hewes (1955) compiled a cross-

McNeill 1992	Efron 1941	Freedman and Hoffman 1967	Ekman and Friesen 1969
iconics	physiographics kinetographics	literal-reproductive	kinetographs pictographs
metaphorics	ideographics	concretization minor and major qualifying	ideographs underliners spatials
deictics	deictics		deictics
beats	batons	punctuating	batons rhythmics

Table 1. Gesture Classifications

cultural analysis of body posture in his *World Distribution of Certain Postural Habits*. Saitz and Cervenka (1962) followed with *Colombian and North American Gestures: A Contrastive Inventory*. But it was Hewes who found the ethnographic record so deplete on postural information that he carried out his own research from published photographs. He surveyed 480 different cultures and found that thirty-four of these cultures were extinct or known only from archaeological data consisting of figurines, carvings, or paintings (Hewes 1955). Hewes found that culturally specific postures could be identified. One, for example, is the *nilotic* one-legged resting stance. As shown in Figure 4. Hewes writes:

The 'classic' Nilotenstellung occurs not only among the Shilluk and their neighbors in the southern Sudan, but in Nigeria (Elkin and Fagg 1953), Iran (Singer and Baldrige 1936), India (Koppers 1944), Ceylon (Buschan 1923), Australia (Elkin and Fagg 1953), in South America among the Nambicuara and Yecuana (Steward 1948), and, if we can accept the California element survey data, rather widely in the American Southwest (Gifford 1940; Steward 1948)...All instances of this stance seem to

be represented by males. Aside from the Nilotic Sudan, where this posture is known to be assumed by cattle herders, we have little information on its cultural functions. Gifford notes that men of the Walpi pueblo at Hopi rest this way in the fields while hoeing (Hewes 1955: 236-37).

Although some of Hewes' data sources are problematic, if nothing else, he has drawn attention to the variations of posture cross culturally and pointed out that some postures are culturally specific. Argyle's illustrations of posture identify states of emotion and communicate moods and attitudes. Along with the postures and gestures discussed so far, another aspect of nonverbal communication must be considered: the way humans use space (proxemics) as a communication system.

Proxemics

The term, "proxemics" as defined by Hall (1979), is the study of people's perception and use of space. It pertains to the complex behavioral activities associated with what is known to ethologists as *territoriality*. It deals primarily with unconscious (out-of-

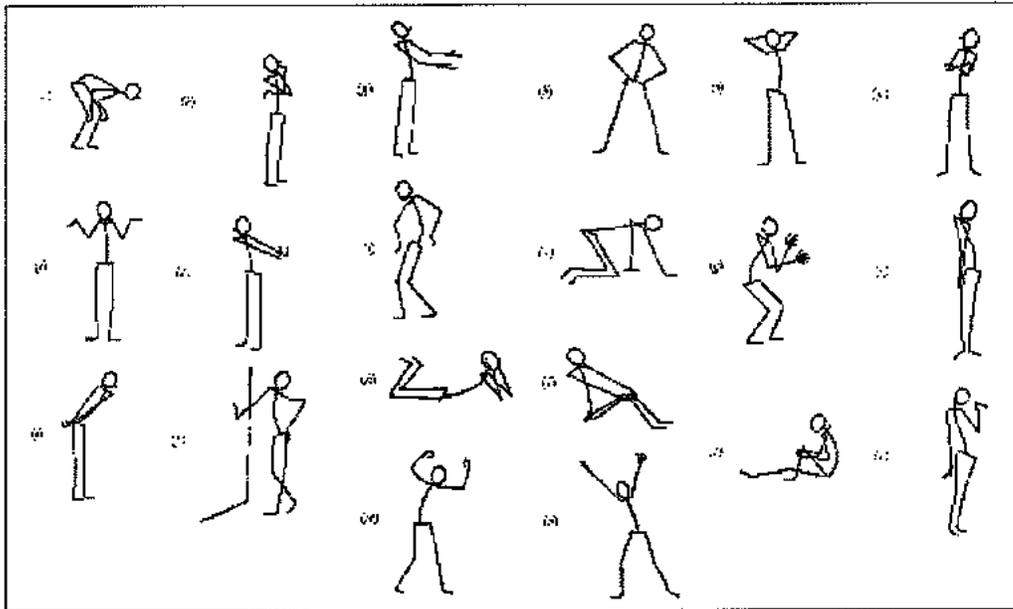


Figure 4. Cross Cultural Postures showing the nilotic one-legged resting stance.
(From Hewes 1957)

awareness) distance-setting or spatial boundaries. Hall bases much of his work on that of Sapir (1927) and Whorf (1956). Proxemics is the study of how humans use space and distance in day-to-day interactions. People of different cultures not only structure their spaces differently, but experience them differently. This influences the spatial experiences of the individual. For example, some people perceive "crowding" while others do not. There are no universal constants in human proxemic behaviour (Hall 1979).

The development of proxemic studies really began with ethologists like Hediger (1950; 1955; 1961) who studied how people interact with other organisms. He believed that humans found it necessary to understand every aspect of game animal communication in order to survive. Hall credits Hediger as one of the first to systematically describe the various distances employed by birds and animals and to introduce the concept of individual space (Hall 1979). Hall designed a research technique free of cultural subjectivity

in order to effectively study proxemics in other cultures. He writes:

It is possible to learn a good deal about how members of a given culture structure their space at various levels of abstraction by setting up simple situations in which they manipulate objects. I used coins and pencils and asked my subjects to arrange them so that they were 'close' and 'far apart' and 'side by side,' and 'next to each other' and then tell me whether two objects were 'together' or not. Arab subjects were unable or unwilling to make a judgement as to whether two objects were close together or not if the surrounding area was not specified. In other words, Arabs saw the objects in a context. Americans saw the objects only in relation to each other (Hall 1979:299).

For American culture, Hall identified four proxemic dimensions, each with a close and a far phase (Hall 1966). The measurement of Hall's spatial categories is based on the length of the human arm and its ability to hold or strike and the stride of the human legs to flee or defend. These physical limitations create the spatial definitions. (I have retained the

imperial measurements of Hall). Hall's distances for humans can be summarised as:

1) **Intimate Distance** ranges from zero to six inches at the close phase and six to eighteen inches in the far phase. This area is reserved for physical involvement, and sensory inputs. The close phase can include wrestling and love-making, comfort and protection. The far phase includes interfamilial interactions. The arms can easily reach around and hold another person.

2) **Personal Distance** ranges from one and a half to two and a half feet at the close phase. This space is defined kines-thetically by what each participant can do to the other with his/her extremities. "At this distance, one can hold or grasp the other person . . . Where people stand in relation to each other signals their relationship, or how they feel toward each other, or both. A wife can stay inside the circle of her husband's close personal zone with impunity. For another woman to do so is an entirely different story," (Hall 1966: 120).

The far phase is a distance of two and a half to four feet. This is "keeping someone at arms length." It extends from a point that is just outside easy touching distance by one person to a point where two people can touch fingers if they both extend arms. This is the limit of physical domination in the very real sense. Beyond it, a person cannot easily "get their hands on" someone else. Subjects of personal interest and involvement can be discussed at this distance. All the details of the other person's features are clearly visible (Hall 1966:120).

3) **Social Distance** The close phase is a distance of four to seven feet. Impersonal business occurs at this distance, and in the close phase there is more

involvement than in the far phase. "People who work together tend to use close social distance. It is a common distance for people who are attending a casual social gathering. To stand and look down at a person at this distance has a domineering effect, as when a man talks to his secretary or receptionist," (Hall 1966:121).

The far phase is a distance of seven to twelve feet. This is the distance to which people move when someone says, "Stand away so I can look at you." Business and social discourse conducted at the far end of social distance has a more formal character than if it occurs inside the close phase.... At the far phase of social distance, the finest details of the face, such as the capillaries in the eyes are lost"(Hall 1966, 122).

4) **Public Distance** is generally used to address an informal group at the close phase (12 to 25 feet), and the far phase, ranging from more than 25 feet, is used when addressing a formal gathering. This distance is also used between the public and an important official.

Hall strongly emphasised the variables that exist with proxemic behavioural studies. People's behaviour is influenced by the way they feel, as well as other emotional, cultural and socio-economic factors. There is no known universal distance-setting mechanism. Each cultural group sets distance in its own way. Figure 5, Hall's Proxemic Chart, illustrates proxemic space in American culture.

These three aspects of non-verbal communication, posture, gesture and proxemic arrangement, are applied to the interpretation of anthropomorphic figures in Native American rock art panels. How have gestures been identified in Western art? Can studies of gesture language be applied to North American rock art? How has it been studied previ-



Figure 6. Family Group, 1559 from a northern Netherlands painter (From Spicer 1991).

Gesture in Rock Art World Wide

A review of the literature shows very little research carried out around the world that addresses body language or the significance of gestures and postures in rock paintings and engravings. Wright (1985) observed variant hand motifs from central western Queensland, Australia and questions whether they represent mutilation practices or depict sign language gestures that illustrate totemic faunal species. His study is limited to hand motifs and does not consider other forms of body language. A few researchers have interpreted rock images using gesture and posture as a reference to their interpretation. Malaiya (1988,1992) is more inclusive in her comparison of what are interpreted as dance scenes in the rock paintings of central India with examples of ethnographic analogies from tribal groups in India. The body gestures, postures and spatial positioning support Malaiya's argument that the paintings do depict dance. Fushun (1991), describes a major site of rock paintings in the southernmost region of Huashan, Guangxi Province, China. He analyses their iconographic con-

ventions and suggests meanings based upon the gestures of anthropomorphic figures. Novellino, (1999) explores the Pálaqwan rock drawings of the Philippines, using indigenous explanations and descriptions. Novellino interprets much of the rock art as a narrative of mythology that is communicated through cultural conventions of gesture and posture in the paintings. Tilley (1999) claims that the carvings at Högsbyn are "a narrative about becoming human" and uses gesture and body posture to support his theory.

Gestures in North American Rock Art

In North America, the independent works by Martineau (1973, 1981) and Rajnovich (1993) refer to gestures as the key to interpreting rock paintings and engravings. Their predecessors were scholars including Schoolcraft (1853), Mallery (1881; 1893), Seton (1918) and Tomkins (1948), who compiled extensive data on North American Indian pictography specifically to identify gestures portrayed in rock art. For example, Mallery claims:

The reproduction of apparent gesture lines in the pictographs made by our Indians has, for obvious reasons, been most frequent in the attempt to convey those subjective ideas which were beyond the range of an artistic skill limited to direct representations of objects, so that the part of the pictographs which still is the most difficult of interpretation is precisely the one which the study of sign language is likely to elucidate. (1881:370)

The work of John Maclean on the Canadian Indian tribes includes the observation that:

It (sign language) has been systematized among some tribes into pictographs, which comprise a native system of hieroglyphs. These pictographs are the visible representation of the gestures. They are found painted on the face of cliffs in some of the strangest places, seldom visited by the white man... Human figures are drawn in the attitude of making gestures (Maclean 1896:45).

A small handbook on Indian Sign Language for Boy Scouts (Tomkins 1926), contains several pages of symbols from painted hides and engraved rocks. A section of the book provides charts illustrating the sign language gesture and the equivalent graphic depiction or 'pictograph' of that gesture. Tomkins writes:

The attentions and investigations of the author have been for a long time devoted to pictography and to sign language, two studies so closely connected that neither can be successfully pursued to the exclusion of the other (1948:74).

Based on the work of Mallery (1881,1886,1893) and Tomkins (1948), Martineau published *The Rocks Begin to Speak* (1973), which addresses mostly historical rock art panels in North America and shows links between sign language gestures depicted by the anthropomorphs and ethno-historic documentation. In 1981, with the help of B.K. Swartz, he co-authored *The Use of Indian Gesture Language for the Interpretation of North American Petroglyphs: a trial analysis*.

Martineau's work focuses on petroglyph panels that have been interpreted from information derived from interviews with tribal members and historical documentation of the events believed to be depicted in the panels. Martineau spent most of his life learning different Indian languages, speaking with elders of many tribes in their own language and studying Indian Sign Language. He communicated in signs with elders in Canada, Alaska, throughout North America and into Mexico. He found little variation among tribes with only specific signs like land forms or names of rivers difficult to interpret. His experience led him to believe that Indian Sign Language was a universal sign system that all Native people in North America could understand, with only a few signs that were specific to each tribe. The

work of La Mont West (1960), concluded that American Indian Sign Language was composed of iconic and lexical signs, of which 90% (mostly indexical) were understood or shared across cultural boundaries, while 10% (mostly iconic) were culturally specific.

Following Martineau's direction of research with the Ute, Paiute, and Shoshone, I investigated the Pueblo myths and petroglyphs found in the Rio Grande Valley, New Mexico. My research compared the existing sign language of the Pueblo people with the symbols and gestures of anthropomorphic figures depicted in the rock engravings near Cochiti Pueblo, New Mexico. (Patterson-Rudolph 1987, 1992) The Pueblo elders I worked with were versed in sign language and the iconography associated with their creation myths. My research then turned to older, prehistoric rock images located in the 4 Corners area of the Southwest that was abandoned by Pueblo people around A.D.1300. Many of the previously identified iconography associated with Hopi, Navaho, and Keresan mythology was present in this research area. In this study, I published several charts illustrating rock art symbols that have sign language gesture equivalents (Patterson-Rudolph1997).

This paper not only provides support for previous research in Indian sign language as it is applied to petroglyph interpretation, but applies the structure of non-verbal communication systems outlined by Hall(1979), Hews,(1955) and McNeill (1992). The following analysis of the McKonkie Ranch petroglyph panel illustrates how this information can be applied.

McKonkie Ranch Rock Art

Figure 7 comes from the McKonkie Ranch site of the Ashley-Dry Fork valley situated in north eastern Utah. This panel is categorized as "Classic Vernal" style (Schaafsma 1971),

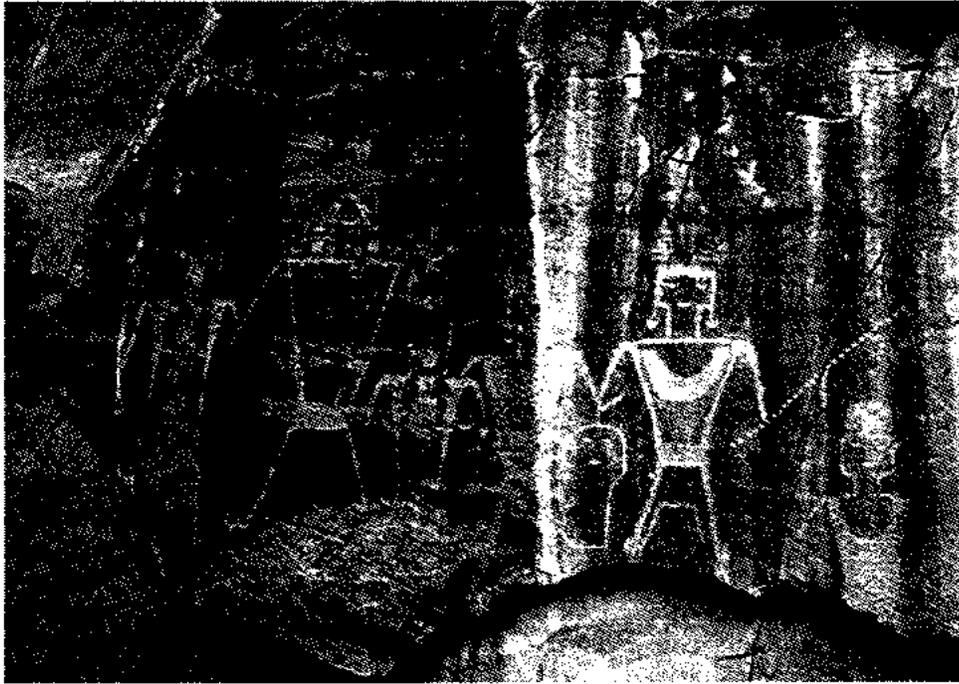


Figure 7, Photograph of the panel at McKonkie Ranch (C. Patterson 1998).

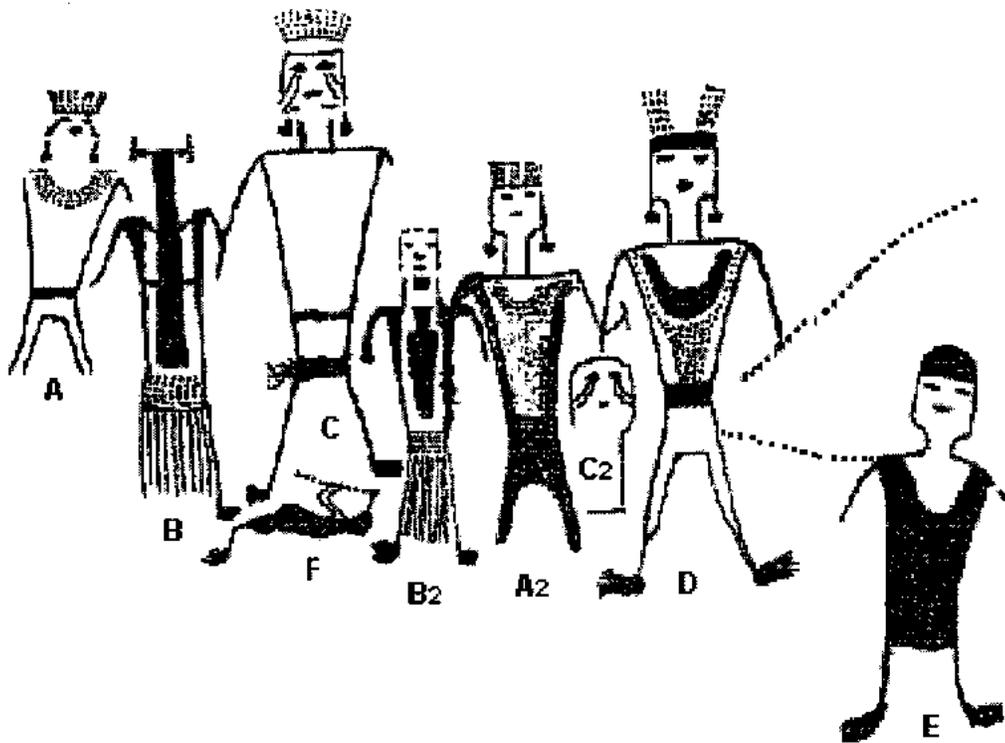


Figure 8, Drawing of Classic Vernal style figures at Ashley-Dry Fork Valley. (From Castleton 1984:21).

petroglyphs. These petroglyphs are probably AD 400 to 1500, (Cole 1990). They are characteristic of flat heads with headdresses, ear bobs, elaborate beaded neck pieces and chest ornaments. Females are depicted with belts of dots and skirts of grass or skin strips while males have only belts. Males are usually broad shouldered.

I have studied each figure within this panel and prepared a separate photo with a paired drawing to clarify the subtle gestures that can be identified. See Figures 8-15.

The first figure on the left, A, is shown here, with many rows of dots incorporating his headdress. He has round ear bobs and five rows of beads on his necklace. He does not have hands or fingers, but displays his right arm diagonally down towards the shoulder of the next figure. Notice that he is not touching the shoulder. There is a clear gap between his arm and the next figures shoulder.

Figure B is assumed to be female, characterized by the skirt depicted here. Figure B has both arms depicted, one is nearly vertically down, while the other is diagonally outstretched and attached to the arm of a third figure. The juxtaposition of a supposed 'male' and 'female' can sometimes indicate a relationship of husband and wife. In the Indian Sign Language, this relationship is indicated by the 'husband' grasping the shoulder of the 'wife' and holding it at a perpendicular angle.

When a woman requests a divorce, she gestures by casting her left arm downward, as if to 'throw away' or 'abandon' something. This gesture for 'throw away' can also refer to 'bad' and 'discard'. In this scene, figure B has 'thrown away' figure A, by the gesture of a down cast arm. The idea of 'divorce' is reinforced by the large gap between her

shoulder and his arm that contrasts what would otherwise represent 'married' if his arm were touching her shoulder.

The other arm of figure B, is attached to the figure C's arm. The gesture for 'hold' is indicated here, by the perpendicular position of her arm intersecting figure C's arm. Figure A has been discarded but what is more interesting, figure B is turned with her back to the viewer in order to portray this gesture with the left arm correctly. She is shown here with a skirt and long hair down her back. There is no face indicated, only hair ornaments and a few bullet holes. Facing backwards allows her to 'throw away' with her left arm, and 'hold on to' with her right arm. See Figure 10, Gestures for 'abandon' or 'divorce'.

Seton writes that this sign means *abandon, divorce, bad, hate and charge*. It is illustrated with the *left* hand cast downward. So convinced was he that pictographs represented gestures, he adds the pictograph equivalent to many of his gesture illustrations, as shown here (Seton 1918:3).

Figure C is shown with ear bobs, a headdress and face decorations or eye stripes. He is shown with a belt and chest ornaments. He is even shown standing over a reclining flute player. This image shows up more clearly in Castleton's illustration than in the actual rock panel. As shown in Figure 12, the fourth figure (B₂) is again a female. This time a face is indicated, with eyes, and chin or mouth. The beaded belt is shown and accompanying skirt. Within the torso is an anthropomorphic figure consisting of a head and torso. This may indicate a pregnancy. Her left shoulder is attached to the right arm of the next figure. Here it is established that she is being 'held' or owned. This grip on her shoulder is a sign language gesture for 'wife'.

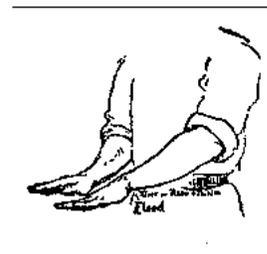
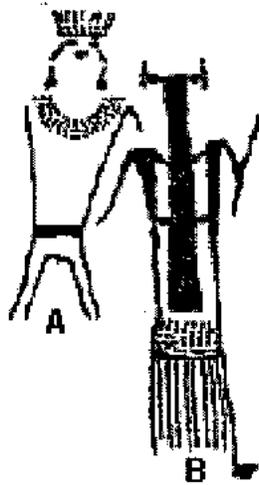


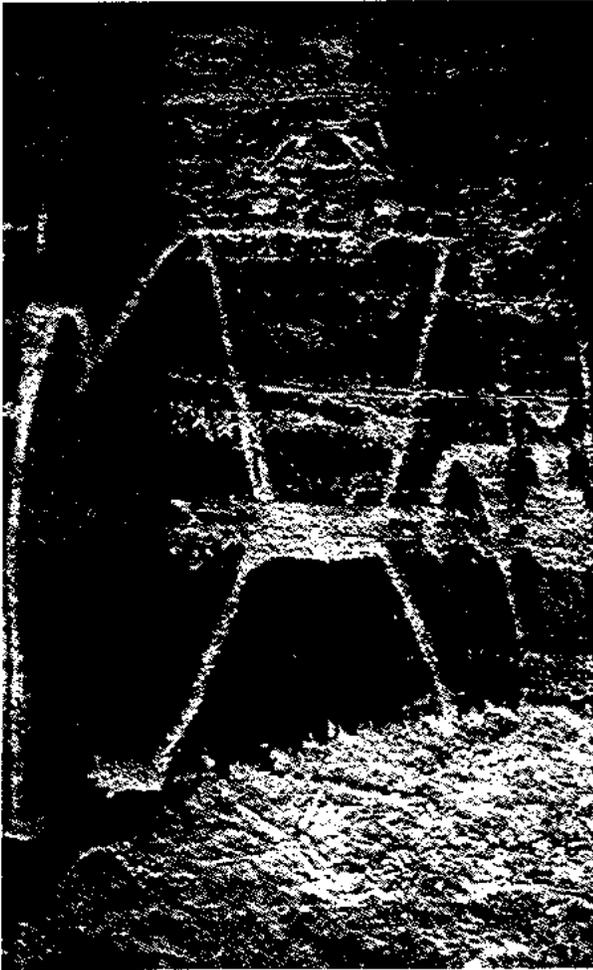
Figure 9, photo and drawing of figure 1 and 2.

I have determined that a new sequence has occurred and these figures are repeats of A and B. Figure A₂ has beaded chest ornaments, ear bobs, a dotted crown and a waste band, in much the same manner as A in the beginning inside her torso.

Figure 10, Gesture for 'abandon' or 'divorce'. Figure B has left arm cast down and broken the attachment with figure A. Figure B is turned with her back facing out and grabbing the arm of figure C. The gesture for 'abandon' or 'divorce' is given with the left arm cast downward (illustration from Seton, 1918).

B₂ is now facing the reader with facial features and she appears to have a smaller anthropomorphic figure inside her torso.

As shown in Figure 13, A₂ has his left arm touching the arm of Figure B. Notice that



together they are holding an object that is round like a 'head'. It has eye stripes, and a mouth that is actually a replica of Figure C in the previous episode.

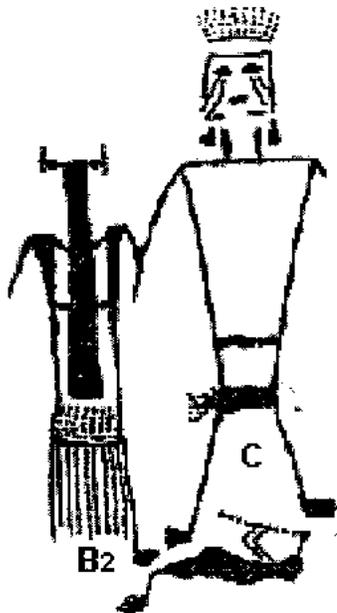


Figure 11. Drawing and photo showing figure B2 holding the arm of figure C and a reclined flute player below the legs of figure C.

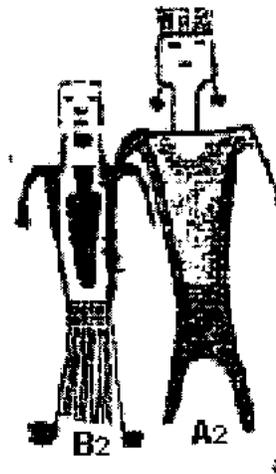


Figure 12. Photo and drawing of figure B2 and A2 who has returned to reclaim her in the second sequence.

Figure D2 has a very different head crown, and chest ornament. Much of his torso is dotted with pits. Figure D2 together with

Figure A2 are holding the 'head' of C2. There is a dotted line from Figure D2 extending diagonally upward. This symbol is often interpreted as a 'trail' or pathway because it represents 'foot prints' going in one direction. In this case, D2 is 'holding' the trail to indicated his arrival from somewhere in the distance.

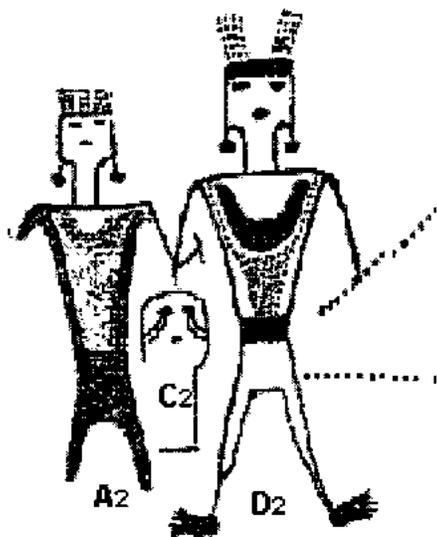


Figure 13. Photo and drawing of A₂ and B who together are holding the head of figure of C.

In Figure 14, drawing E is different still, with a very plane skullcap and clothing. It most likely represents a child of uninitiated member of this group. A trail from the previous sequences intersects his shoulder, indicating the family history that 'owns' him.

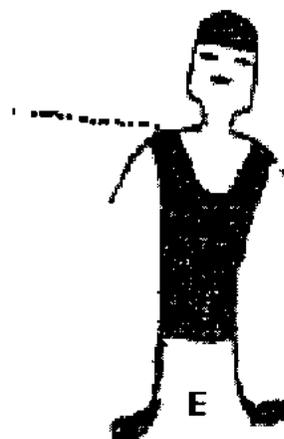


Figure 14. Figure E with a simple costume and a trail leading to him from the past events

Figure 15 includes guide lines and labels to help facilitate a proxemic analysis that leads to my interpretation. Figure A or Adam is smaller and diminished in size in comparison

to his reappearance farther along. Starting with him, we see he is 'detached' from the other figures. His is on level 1 signaling the first event in this narrative. The next event occurs at level 2 and introduces figure C or Beth and C, Carl. Although Carl has his foot slightly elevated, as if 'stepping' down to the same level as B, I have marked the average special position for them both. Carl has a flute player below him (F) that is show

positioned below his legs. The next event is illustrated with Figure B2, A2, C2, and D who are lower still, with feet on level 3. Both Beth and Adam are repeated and a new figure, Dave, has joined hands with Adam. Beth has a smaller anthropomorphic figure inside her torso. I interpret this as a 'pregnancy' following the given context of a reclined flue player and what I see as Carl's romantic agenda.

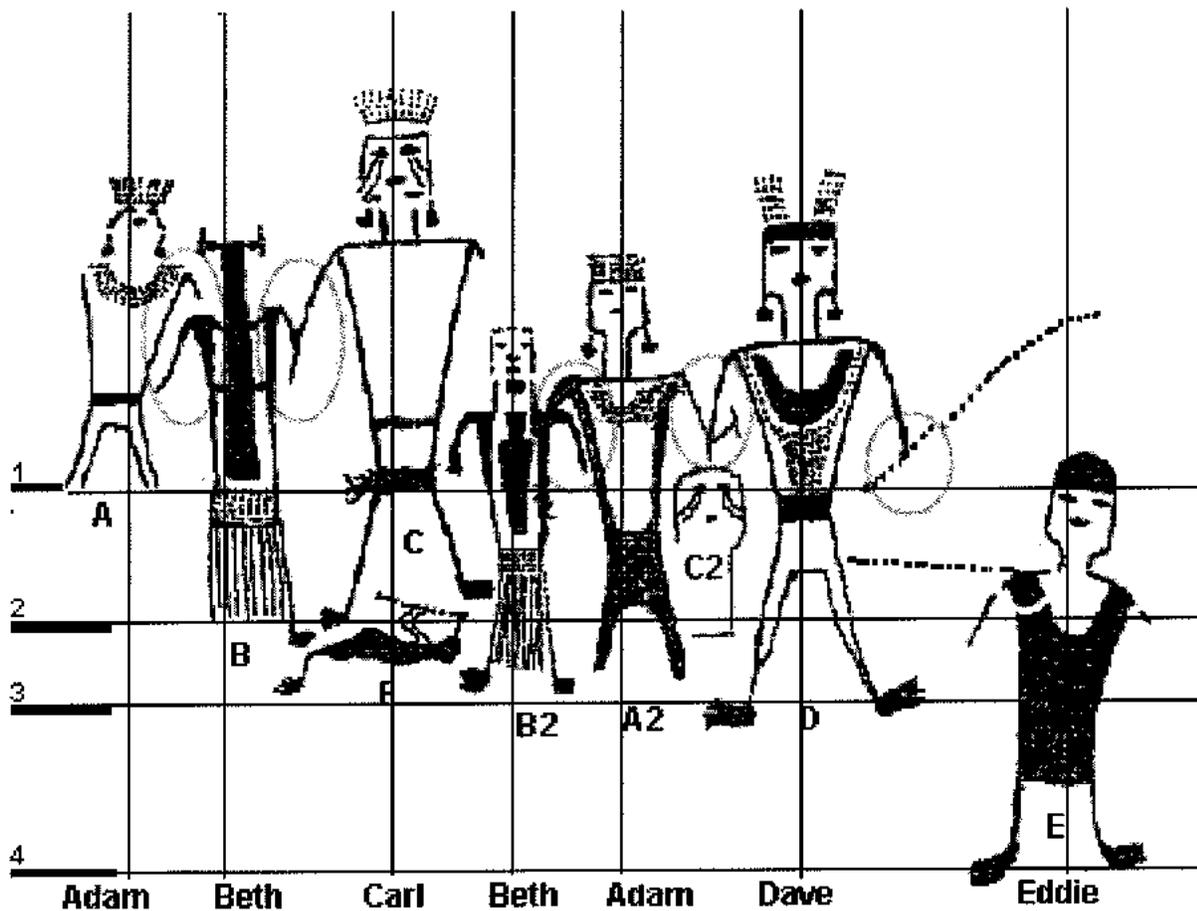


Figure 15. Schematic drawing showing 1,2,3,and 4 levels of time with the names figures, A,B,C,D, and E as participants in a narrative in time and space. Circled areas are iconics representing known gestures of 'divorce', 'hold' 'own/wife', 'join' and 'having come from (trail)'. Figure F, B2, C2 are metaphors.

Together they are holding Carl's head. These figures have lower feet positions indicating a closer time to the present. Level 4 introduces Eddie. Though partially spalled off in the panel, Castleton's illustration shows the

approximate level of this figure's feet. Eddie's costume is very simple and unadorned in contrast to the beads of head-dresses of the adult figures. Eddie's shoulder is touching a dotted line leading back to Dave

indicating an ownership relationship. It is plausible that Eddie, an illegitimate child of Carl, has become the slave of Dave in a deal worked out with Adam to solicit Dave's help in slaying Carl.

The subtle positioning and juxtaposition of every element in this panel has important significance. Circled in grey are gestures that can be interpreted from a working knowledge of Indian sign language. They are abbreviated into simple graphics that I call graphemes, and they fit with McNeill's (1992) terms for gesture categories. Within the grey circle is the grapheme abbreviation for a gesture/world or phrase.

Parallel Structure to Gesture

Returning to McNeill's structural analysis of gesture as a guide, it can be demonstrated that the graphic depiction of a gestural narration contains the same components.

The **iconic** gestures are *words* that have sign language equivalents. Circled in gray in Figure 15 are 5 iconic gestures: between A and B is *Divorce*; between B and C is *Holding*; between B2 and A2 is *Own/wife*; between A2 and D are two gestures, *Joined* and *Holding* (two arms joined and one arm ending in a holding symbol).

There are eight **metaphoric** gestures. These are refined by a **base** icon combined with a **referent** concept. Again in Figure 15 A, C, and D are identified as males, while B is identified as female. Figure E is a child. These are the **base** or concrete entities. The concept or **referent** is metaphoric. A is a male that has been *thrown away*. B is a female *leaving one man for another*. C is a male with a flute player between his legs, that implies *seductive power*. B2 is a female that is *pregnant*. A2 is the same male as previously shown, who has reclaimed or *taken hold*

of his wife. D is a male who has joined forces with A2. Together they have *decapitated* C2 who has lost his body and is obviously *dead*.

Deictic devices point out *direction* and are also used in this panel. The male figure D is touching a dotted line indicating the direction from which he has arrived. Figure E has a dotted line touching his shoulder and traveling back in the *direction* of Dave. In this case it represents a tie or relationship between the two.

In summary, the postures first appear to be static, but under closer investigation the subtle gestures and dynamic proxemic arrangements create a narration that has depth in terms of time and space, intrigue in terms of gender and sexual liaisons, and social repercussions in terms of family relationships.

Iconic and Metaphoric Gestures

The following discussion regarding Figures 16-23 pertains to iconic graphic depictions of sign language gestures. However, full investigation of metaphoric elements has not been attempted.

Figure 16, with the parent illustration from Martineau (1973), shows the use of a metaphoric gestures that incorporate anthropomorphic figures (base) with iconic elements (reference), such as "sky", "rain", "snake", and "mud" to illustrate a narration. Martineau interprets this portion of the Buckhorn Wash panel as a description of the Hopi Snake Dance that is done to bring rain in the late summer. Inside the Figure 16 drawing is a box illustrating 'coming rain' from Mallery (1972: 662) based on a recording of the Moki (Hopi) symbol of Aloseka, associated with rain. Martineau (1973) writes that it is a symbol of the foot stepping in soft mud, the result of rain. In context with the other iconic elements associated with rain, I think this is a logical interpretation.



Photo by Steven Manning

Figure 16. Buckhorn Wash showing the anthropomorphic left of the far right figure with legs terminating in concave lines. Graphics of Buckhorn Wash showing abbreviate symbol for 'mud' or soft ground

All three anthropomorphic figures illustrated in the graphic, are metaphoric in that they have additional iconic elements. Anthropomorph (a) has an arch (sky) and arm extended with vertical lines (rain) descending. Next is (b) holding a 'snake' that is often found associated with water in Pueblo ethnography. And (c) has extended legs that terminate in concave lines that combine the concept of "stepping down" with "soft ground" giving the reference of stepping into mud.

In Figure 17, we see another example of this symbol found at Virgin Springs. Here again, are dancers with legs terminating in the "mud" gesture. These figures are found within the same context of rain making, resulting in soft mud that splashes up and outward as one steps into it.

Both panels have depictions of 'rain' falling from outstretched limbs of the dominate figure.

There is meaning portrayed in the actions and gestures of the animals on the left and icon associations with the bird-like figure held

overhead spewing blood/water/rain from its head. This panel displays a narration the meaning of which would not be readily understood to outsiders without its reference to gestures. It is not within the scope of this paper to give a full analysis of this panel, but it does display similar attributes to those of Buckhorn Wash.

Examples of iconic and metaphoric gestures can also be found in pictograph panels from north-eastern Utah at 3 Canyons ranch, on Westwater creek. Located at the convergence of East and Middle Canyon, this rock art panel serves as a warning to passers-by of possible flash floods occurring at this junction.

Three Canyons Ranch, Westwater, Utah.

In Figure 18, the red paint has been over-painted with white paint to obscure the red figures. They are not shields, but are 'flash flood' warnings to travelers wishing to camp at this site.

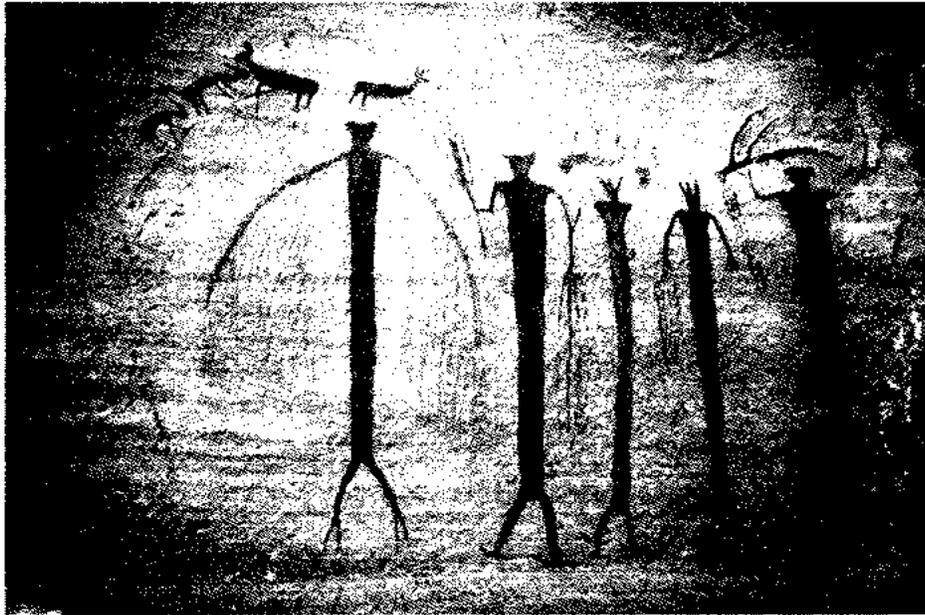


Photo by Steven Manning

Figure 17. San Rafael Reef panel showing four figures holding objects with their legs terminating in concave lines. The 'winged' figure has legs terminating in forked lines.



Figure 18. Red painted figures above Westwater Creek.

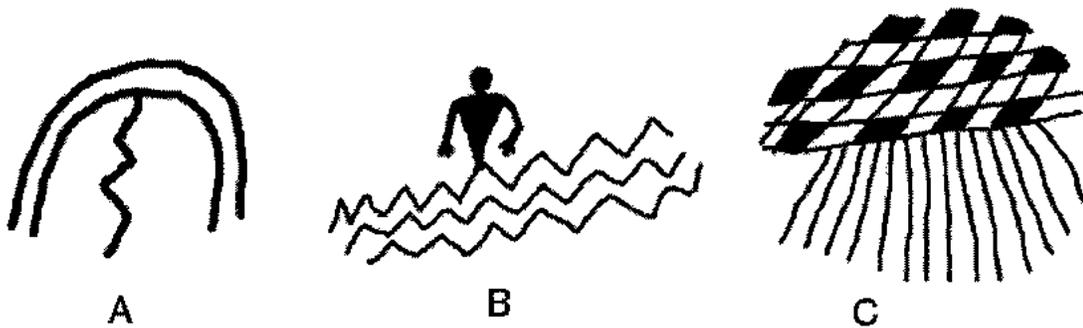


Figure 19. Graphic of the panel with iconic elements A and C and the metaphoric element B.

In Figure 19, the iconic element A is a combination of a pair of arched lines represent a 'sky', and zigzag line representing a 'lightening bolt'. The double line represents an 'empty' sky. This symbol comes from the combination of an 'arc' representing the sky, and two lines parallel to each other with open space between that represents 'empty'. The zigzag line descending down represents lightening.

Compare Mallery's example of the Ojibwa example of a 'clear sky, and a stormy sky contrasted with an Ojibwa 'night sky' with stars in Figure 20. All utilize the arc to represent the sky.(Mallery 1972).

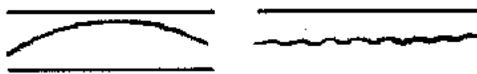


FIG. 1134.—Clear, stormy. Ojibwa.



FIG. 1140.—Ojibwa.

Figure 20. Symbols for 'clear sky, stormy sky and night sky', Ojibwa. All use the arch to represent the sky.

The lightening bolt is an iconic element that has its sign language equivalent. Mallery writes that lightening is portrayed as follows:

"Right hand elevated before and above the head, forefinger pointing upward, brought down with great rapidity with a sinuous, undulating motion, finger still extended diagonally downward toward the right. (Mallery 1972, 702).

The center graphic B, in Figure 19, depicts an anthropomorph standing waist deep in water. Water is represented by wavy lines. The symbolism derives its meaning from the gesture sign 'to go back and forth'. It is signed by extending the hand and moving it back and forth, like waves on water.

Panel B shows a human figure about waist deep in 'water'. The figure is not of any specific 'style', as Schaafsma (1971,7 or Ute (Kelen and Sucec 1996, 102)and Cole (1990) contends, but simply a representation of a human waist deep in water. See 'water' symbol d, Figure 21, from Mallery (1972). The sign language gesture for "flood" is :

If a river, make sign for it; then hold the extended hands, backs up, near each other and little to the right of body, hands in same horizontal plane, and height of waist... If from cloud, frost, or other cause, make signs and proper position of hands to indicate the rushing waters (Clark 1885).



Figure 21. The top panel shows an anthropomorphic figure waist high, and the symbol for 'water' similar to Mallery's illustration for water (d), (Mallery 1972, 642). The bottom panel is the gesture for 'flood' with hands held at waist level (Seton 1918).

Seton (1918), writes: **Flood:** "indicate source of Water, then hold up both flat hands, backs up, side by side, waist high."

The third panel C, shown in Figures 19 and 22 has to do with rain coming down out of a night sky. The sky is checkerboard a motif that in some contexts represent a cloudy sky or the Milky Way.

Rain is represented by descending parallel lines in Mallery (1893) "rain" and "lightning", Martineau, Tompkins and Patterson-Rudolph, Figure 22 and the sign language equivalent, Figure 23.



FIG. 1149.—Rain. Moki.

Figure 22. Rain symbols from Mallery 1893. Compare with graphic of end panel from Ranch site showing "night time sky" with "rain" coming down (Figure 19C)



FIG. 1002.—Gesture for rain.

Figure 23. Illustration from Mallery (1881) showing sign gesture for 'rain'.

The literal translation of these elements, from right to left would be 'lightening' from 'open' 'sky'; 'waist deep' 'water' ; 'rain' from 'night sky'. It is a warning that flash floods can occur when it has been raining up in the highlands even though below in the mouth of the canyons the skies appear clear. Watch the evening sky for lightening on the horizon and beware of flooding waters.

The pictograph panel is located at the convergence of two canyons. Water is carried down

Hay and East Canyon from high up in the Book Cliffs. Rain storms that occur up high might not be visible from down below at the end of the canyons. Camping near this panel would put one in the direct path of a flash flood. Ranchers living here have given testimony to the "30 ft. of water" that has suddenly comes roaring down the river bed without warning on a seemingly calm clear night.

CONCLUSIONS

This paper has briefly discussed a limited number of sites that illustrate the parallel structure of gesture language, as described by McNeill and others, and its graphic equivalency in Numic rock art panels. By Numic, I mean a linguistic stock of people, predecessors of the Shoshone, Ute, Paiute and Hopi who are most likely the authors of these panels. All were versed in gestural communication and at the time of contact had developed a formal sign language. The McKonkie ranch site depicts Shoshonean costume characteristics, while the Buckhorn and Virgin Springs site depict Hopi rain ceremonies. The 3 Canyons Ranch site lies directly on a well known Ute migration trail with Ute camps present at the time of contact.

Mallery, Martineau, Seton, and Tompkins of the nineteenth and twentieth centuries have pointed out the correlations between pictographs and gestures/sign language. They have illustrated the graphic equivalents for each gesture in their publications. I believe that recent information in the twentieth and twenty-first century regarding the structure of gesture language and acknowledgement of sign language as a "language" by Stoke, Corballis, Armstrong and Wilcox, among others, will facilitate a closer analysis of certain petroglyph panels demonstrating that a narrative 'writing' is present. This *picture writing* can be interpreted using a working knowledge of sign language as the key to unlock its emic meaning.

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