

SOLAR OBSERVATIONS IN CLEAR CREEK CANYON 1985-1987

BY

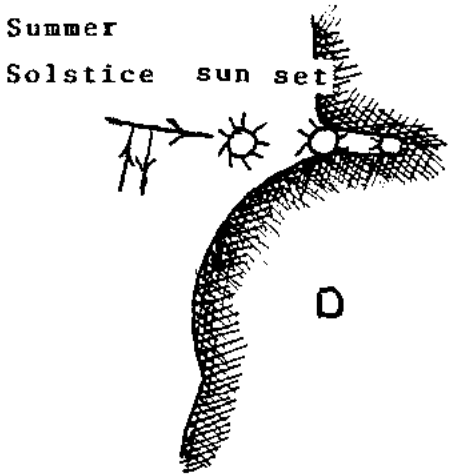
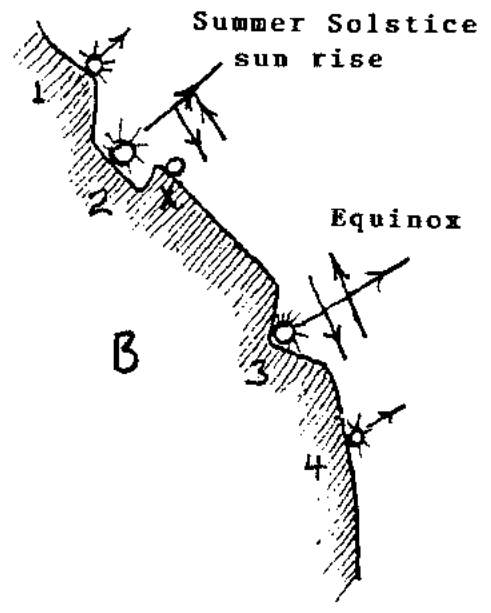
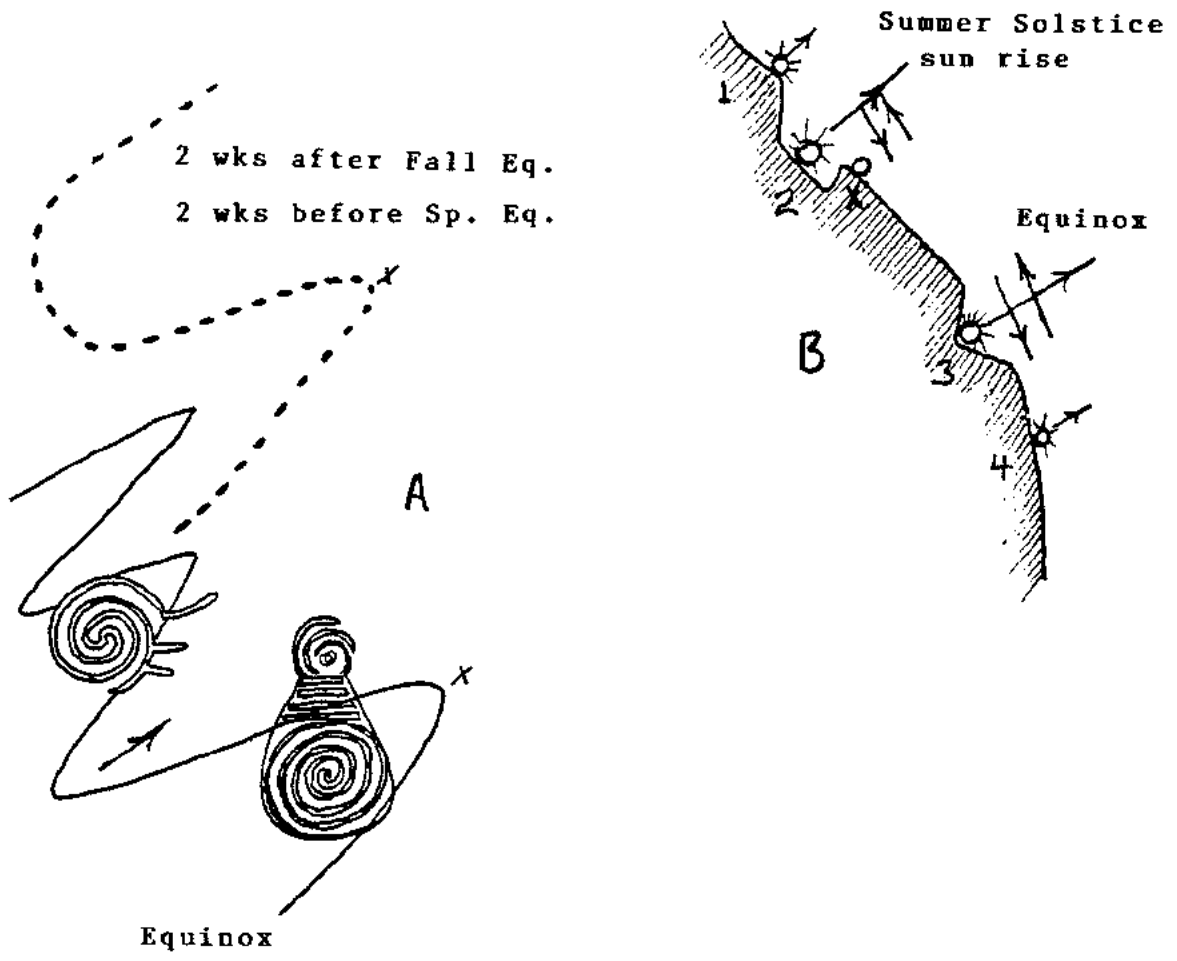
JESSE E. WARNER

Because of Clear Creek Canyon's unique place in the local geography and the heavy archaeological remains, it is only feasible that this canyon would hold many sites where solar observations were made. Because of the nature of most solar observation shrines, I did not expect that the majority would occur so close to Five Fingers Knoll. Even though we have viewed interacting panels up and down the full length of the canyon, most of the interacting or active observation sites viewed so far are among the panels which are very close to Five Fingers Knoll.

I first began to watch for solar interacting panels in the canyon one week before Summer Solstice in 1984. At that time Richard Morrey, Asa Nielson and myself made a presentation to the Sevier Chamber of Commerce for The Clear Creek Canyon Archaeological Association. That presentation was to help promote the museum in which we are now meeting. On that weekend I located and partially observed about 12 panels that from my notes had the best potential for interaction. I did this so I might have some idea before our presentation of the amount of solar observation that occurred in the canyon. From the first beginning I realized this was another rock art treasure in that this area will be a great laboratory in which to investigate these and other problems for many years to come.

During the meeting in the Sevier County Court House in June 1984 it was my intent to stress the unusual importance the inscriptions in Clear Creek Canyon will play in helping us to understand what has transpired in this area. This information will undoubtedly add to what the archaeological record will or will not reveal. Clear Creek Canyon is in an unusual and even unique position in that it is a major passage between two north-south corridors which has a considerable amount of available rock surfaces suitable for rock art. As a passage it contains rock art left over an extremely long period of time by many different peoples. It also occurs at the boundary of several different styles of Fremont Rock Art as well as other different cultures. Given these circumstances there must have been a tremendous intercourse of goods and ideas from all directions. If such was the case, there should be a considerable record left in the rock art.

With the heavy population between here and Richfield we should be able to expect a higher localized development of both ceremonial activity and solar observations manifested in the inscriptive record. That is one of the major questions that will need to be answered by those who have an interest in this area. This museum will hopefully play a major part in that process, in part as a clearing house for information, center for coordinating research, and the impetus of organization.



Moab



FIGURE 1.

One of the problems that the rock art in this canyon creates is the many distinctive and uniform localized variants that evidently developed here and occur at so very few sites beyond this canyon. With just a cursory overview the stylistic indicators here have a distinctive style specifically divergent from other contemporaneous groups in the vicinity. These are different enough that this area may eventually be labeled as either a distinct or strong substyle of the Sevier Fremont, beyond Schaafsma's definitions. This pattern will probably predominate the stylistic profiles as they are compiled with more data from the local areas and across the state (Schaafsma 1971).

By the end of 1986 we estimate that there will be at least 160 panels that need to be observed to provide a more complete record of the types of observations that were made here. In 1985 and 1986 several local researchers helped observe some panels. We would like to open the invitation to others to join us in the thrill and excitement of discovery and also the moments of sheer boredom which are only some of the rewards of this type of research.

One of the best rewards is that this type of information can be incorporated within this museum as an educational tool to help those who have no idea what rock art is, to understand that these people were much more than ignorant savages, a bigoted image that still too often persists. By demonstrating the ethnographical background of such activities, it cracks the wall in the minds of the uneducated and begins to let a little light in. It also helps us to have a great deal more appreciation for the harmony and contact that we have lost with our environment. It helps remind us that we cannot be totally whole or complete unless we stop, pause and harmonize ourselves with these life-giving forces. By so doing, those who do receive far greater benefits in the physical world because of the peace and harmony they have achieved on the spiritual level.

At Mill Creek Junction, on a panel known as "Newspaper Rock" is a conspicuous looking folded spiral (Fig. 1A). This spiral has a tail that bends at an angle and points up into open space on the cliff above. The interior of the spiral folds and returns back out, ending on the right with a line that simply points down. Above the end is another line that points up to the right. It just so happens that there are two obvious notches up to the right on the skyline in the vicinity of these pointers. It is not an exact alignment between the two notches and the attached lines but it is close enough to have given me the impression that this marked the spot of sunrise on Summer Solstice and Equinox. While in the canyon a week before solstice 1984, I stood on top of the large pedestal below and placed my head on the spiral to see the sun rise just short of the upper notch (Fig. 1B,X). This was enough to convince me of the fact that this was a significant sun shrine.

At that time I was not aware of any other similar type of glyph marking a sunrise location with such a pointer. Not long after that I viewed the sun setting into a notch in Seven Mile Canyon which was marked by a tailed spiral on Summer Solstice, 1985 (Fig. 1C, D). Because of a tight observation schedule, it was not until June 22 of 1986 that I was able to return to watch the sunrise, centered in the upper notch. However, on Fall Equinox 1985 I watched the sun rise out of the lower notch from the same location. This was again observed on Spring Equinox, March, 1986.

Point X is two different illustrations of the same boulder

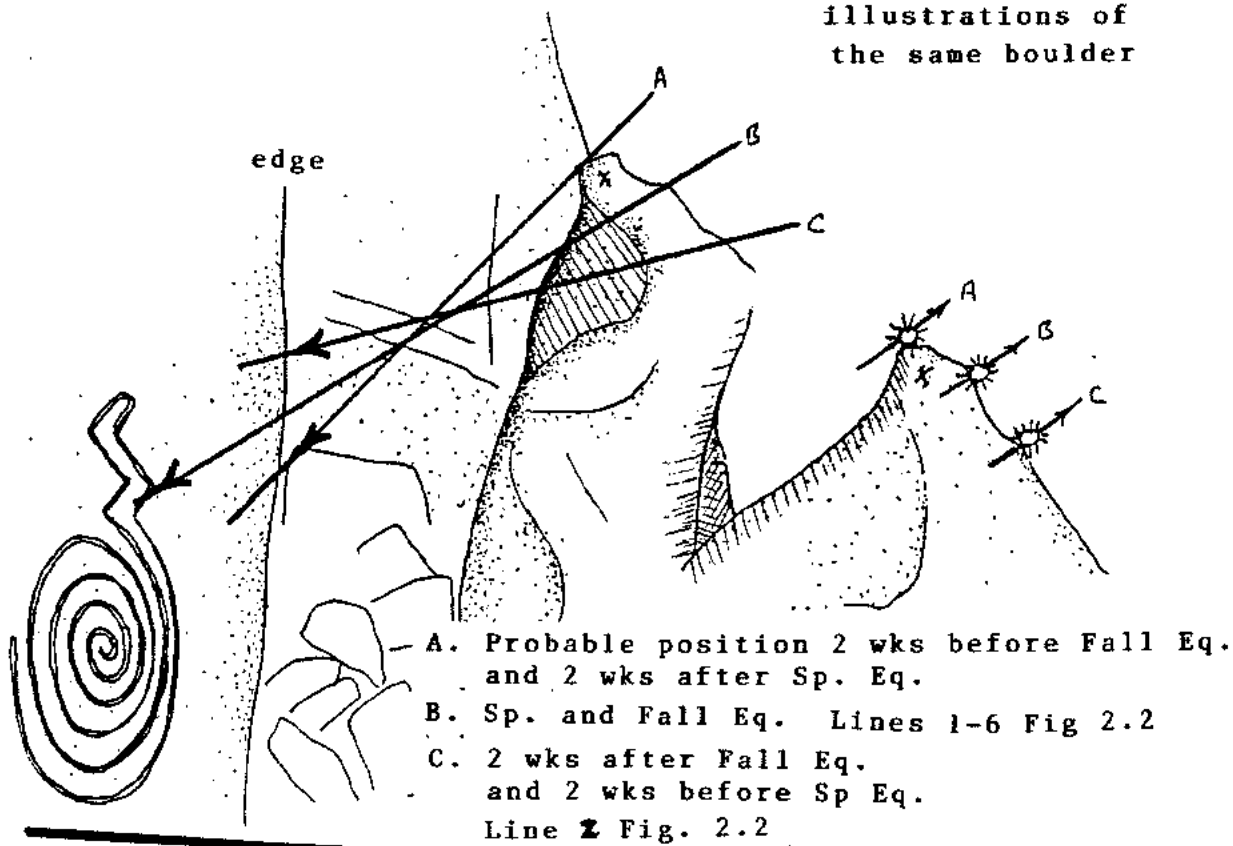


FIGURE 2-1

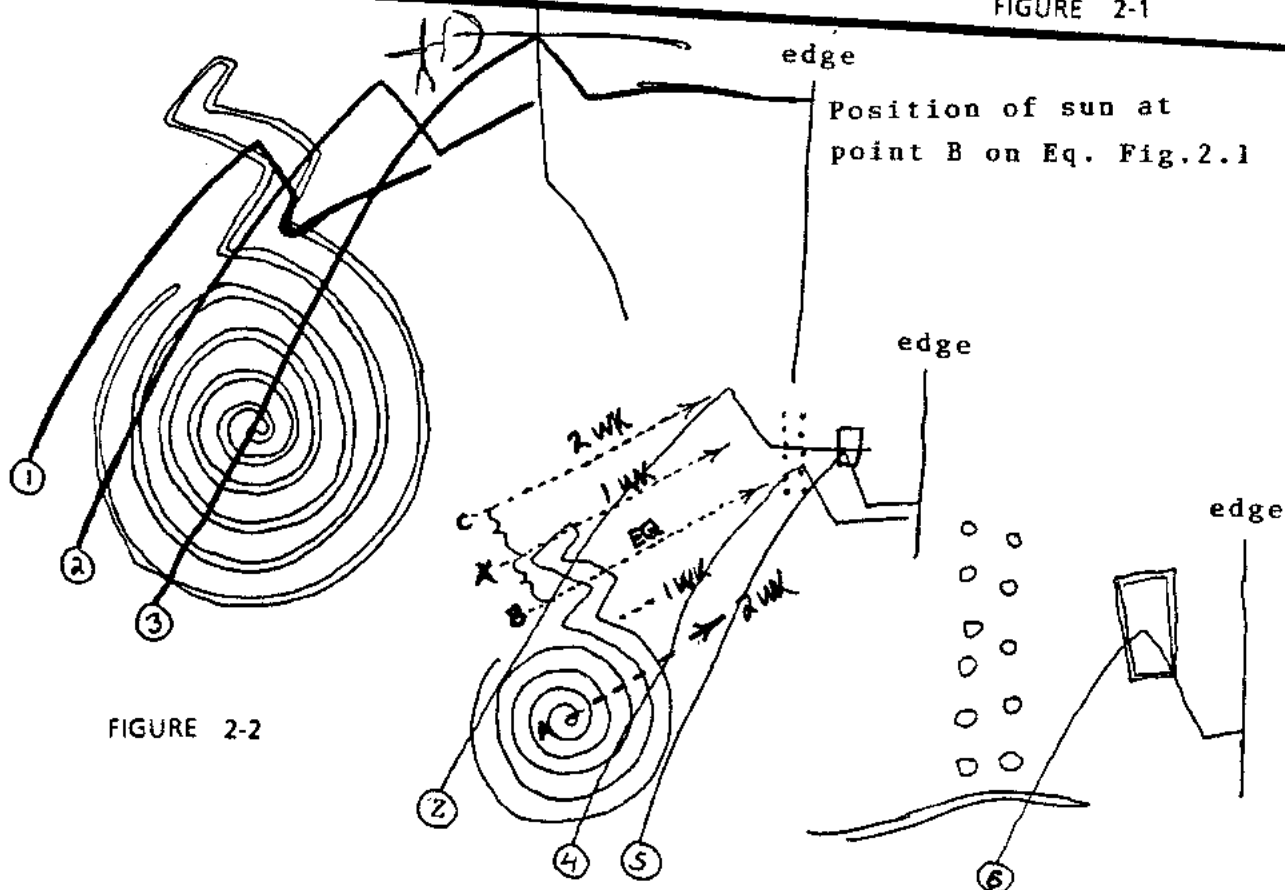


FIGURE 2-2

There is a third, much fainter line that extends from the spiral just under the Equinox marker that probably marks the position for sunrise on Winter Solstice where the far canyon meets the edge of the cliff. I haven't returned for that observation.

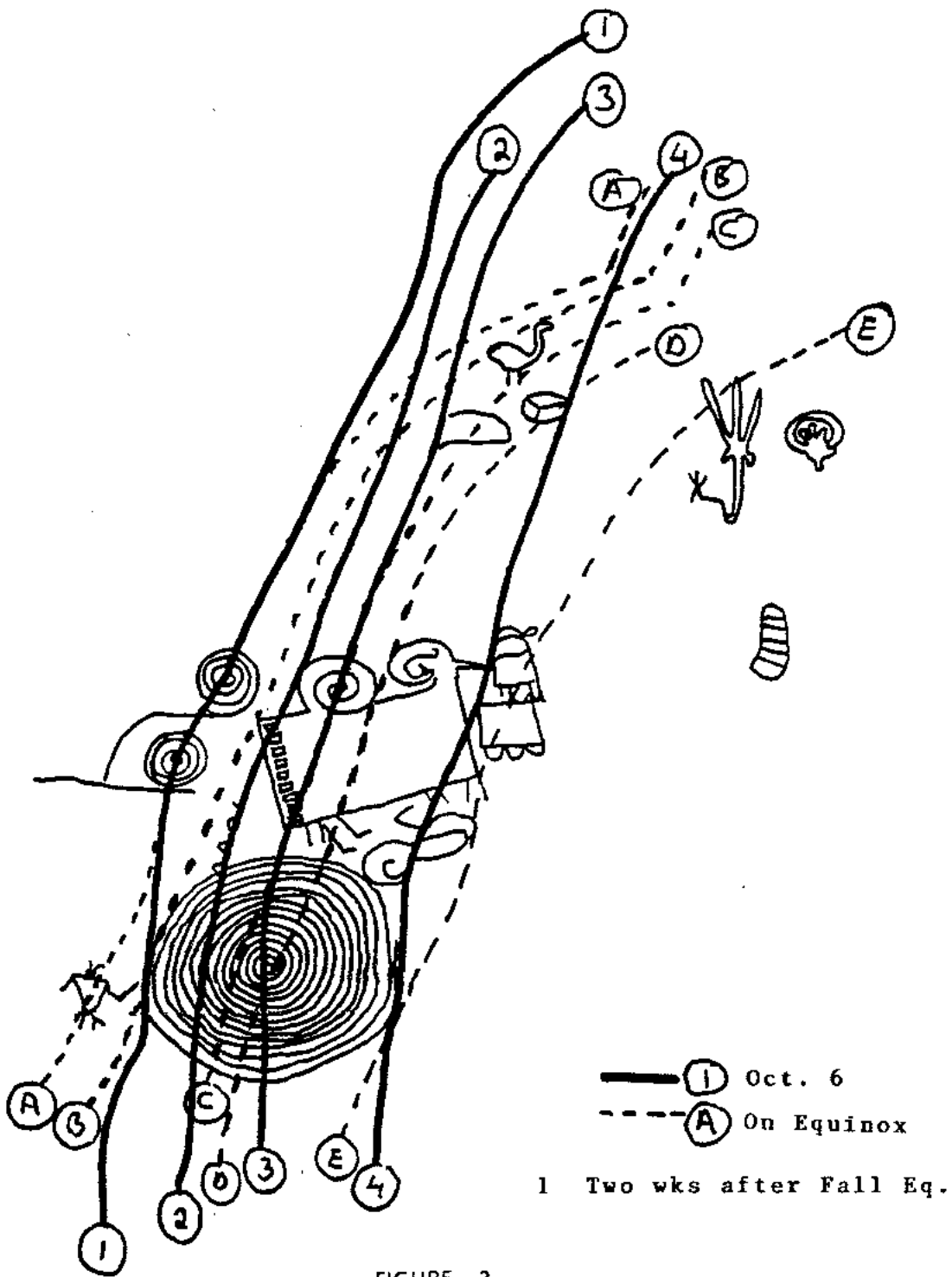
Down the cliff just a short distance and on an upper ledge is another spiral with an odd form. This was first watched on Oct. 6, two weeks after Equinox. At that time the point of the rock to the right cast a triangular shadow that was above the center of the spiral (Fig. 2.1 line C, 2.2 line Z). On the next Equinox, the sun was still below the point of the boulder from the spiral, but the interaction with the spiral was interesting. Notice the form of line 1 (Fig. 2.2), as it moves across the zig zag folded extension. Making adjustments between the movement of the shadow two weeks after Equinox (Fig. 2.2 dotted line C, solid line Z), and on Equinox (Fig. 2.2 dotted line B, solid line 4), would probably place the point of the shadow in the vicinity of the top of the upper zig zag extension Fig. 2.2 dotted line X), about one week after Fall Equinox or one week before Spring Equinox. It is obvious this spiral needs to be observed at several periods between Equinox and Summer Solstice before its total significance is understood.

By examining the difference in the sun's positions on the point of rock two weeks after as well as on Equinox, it seems that the period of time that the sun would be visible on the exact point from the center of the spiral would be approximately two weeks before Fall Equinox. At that period the point of shadow should touch the center of the spiral (Fig. 2.1 line A, 2.2 dotted line A). Because not knowing if that was an important period or if that was the interaction for which the design was created, no subsequent trips have been taken to observe that possibility, when possible it will be. At a later date I will make some observations on the probability of their dividing the year into 16ths as well as 8ths.

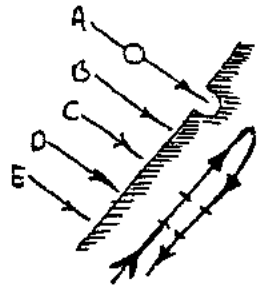
This demonstrates very well the movement of the sun into an alignment and then out again. On many panels we are beginning to notice elements that seem to mark periods other than one of the prime solar or cross-quarter dates (Preparatory or Conformation).

The large panels around the cliffs to the right of Newspaper Rock raises some interesting questions. It was first observed two weeks after Fall Equinox. At that time there was an exact center-to-center bisection of the large intersected spiral and the spiral on the large sheep's back (Fig. 3 line 3). On Equinox, this alignment does not occur (Fig. 3 line C). On Equinox, however, a line does bisect the centers of the left concentric circle and spiral (Fig. 3 line A). On the date two weeks after Equinox, however, that alignment is still about the same. On complex panels like this one, it is almost impossible to immediately identify all the calendrical periods that a panel was used for to mark throughout the year.

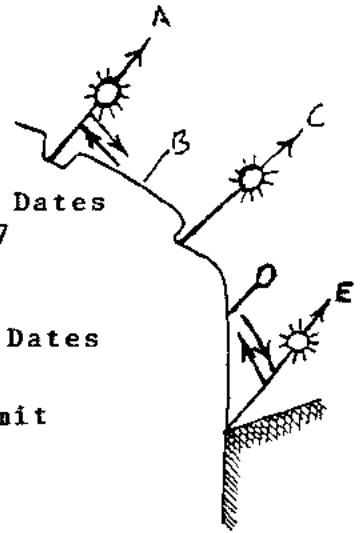
Figure 4 illustrates that at two different periods throughout the year the sun will be at the same position in the sky as were the shadows on the cliffs. Thus a period two weeks after Spring Equinox will have the same shadow configuration as two weeks before Fall Equinox. Also, two weeks before either Summer or Winter Solstice would be the same as two weeks after, but



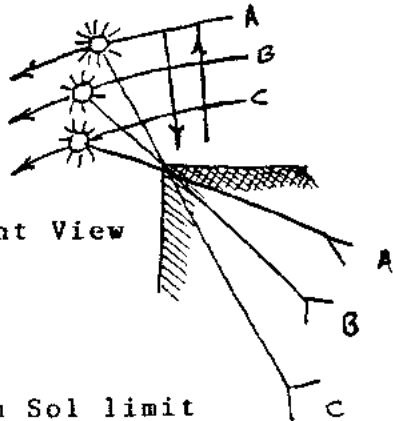
A- Summer Solstice limit
 B-E Equal pds before and after
 Sum Sol



A- Sum Sol limit
 B- Cross Quarter Dates
 @ May-Aug. 6-7
 C- Equinox
 @ Mar-Sep 21
 D- Cross Quarter Dates
 @ Nov-Feb 6-7
 E- Winter Sol limit

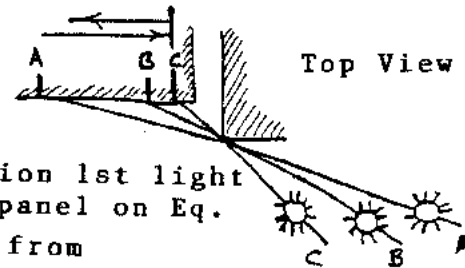


Front View



A- Sum Sol limit
 B-C Equal pds before and after
 Sum Sol

Top View



A- Position 1st light
 hits panel on Eq.
 4.5 in from
 1 day to the next
 B- Evidence the sun slows down
 C- As far right as the 1st light ever
 appears, Wint Sol.

slot in roof
 of overhang

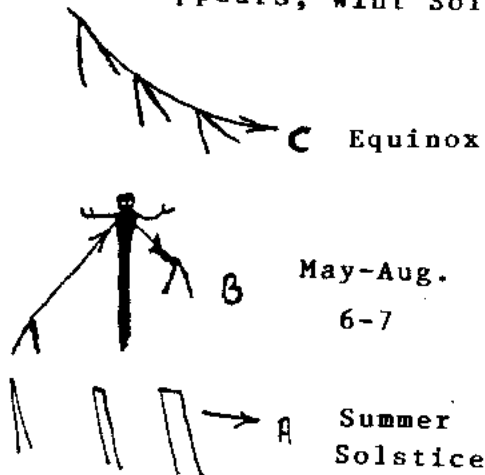
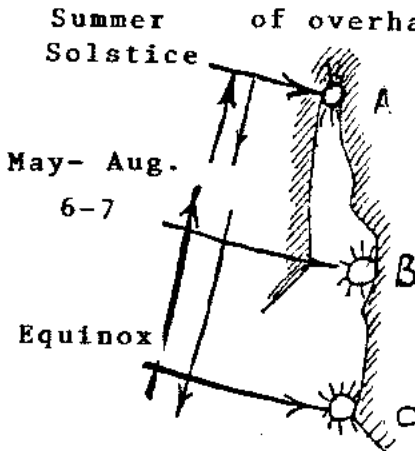
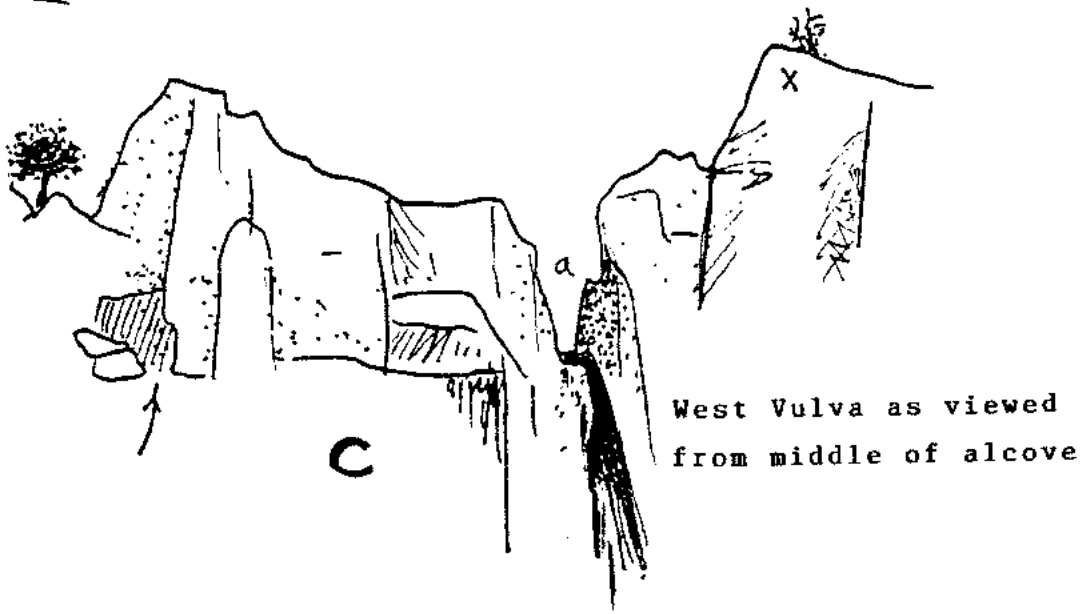
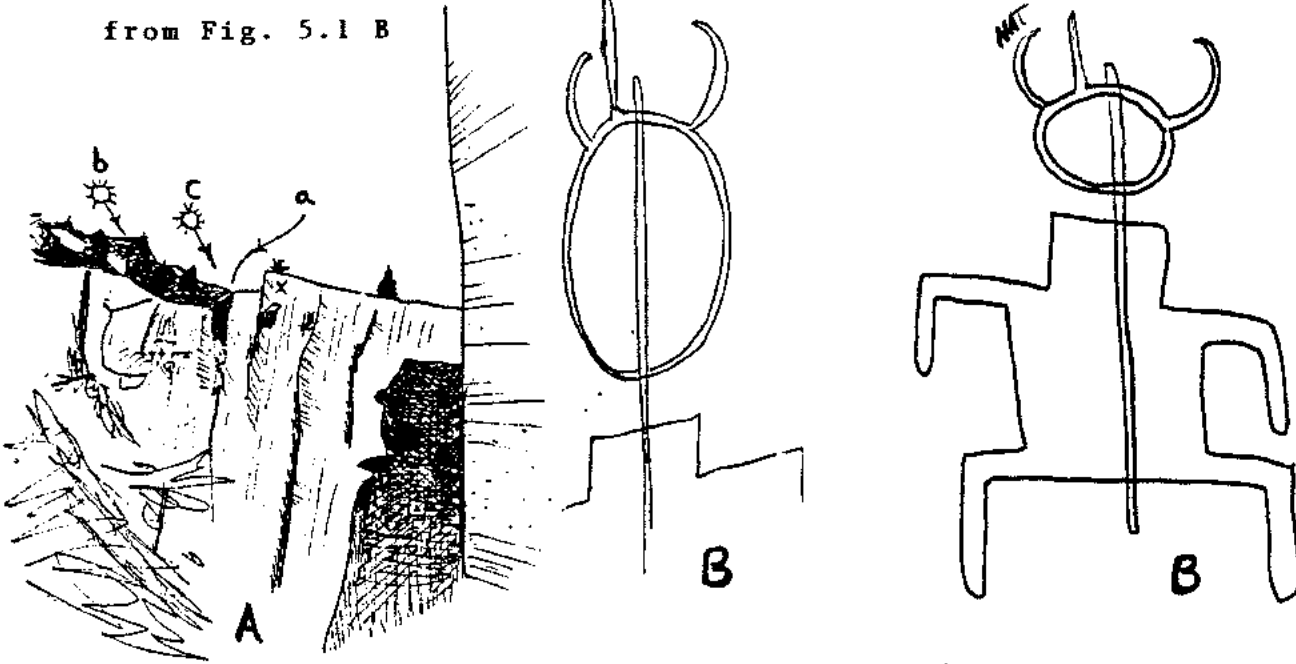
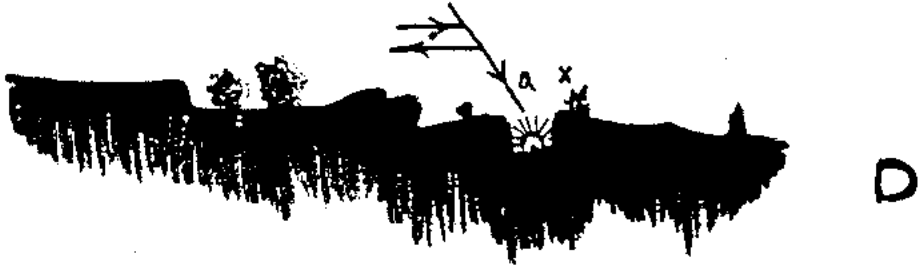


FIGURE 4.

West Vulva as viewed
from Fig. 5.1 B



West Vulva as viewed
from middle of alcove



Summer Solstice sun set as viewed from
the other side of Fig. 5.1 B

FIGURE 5-1

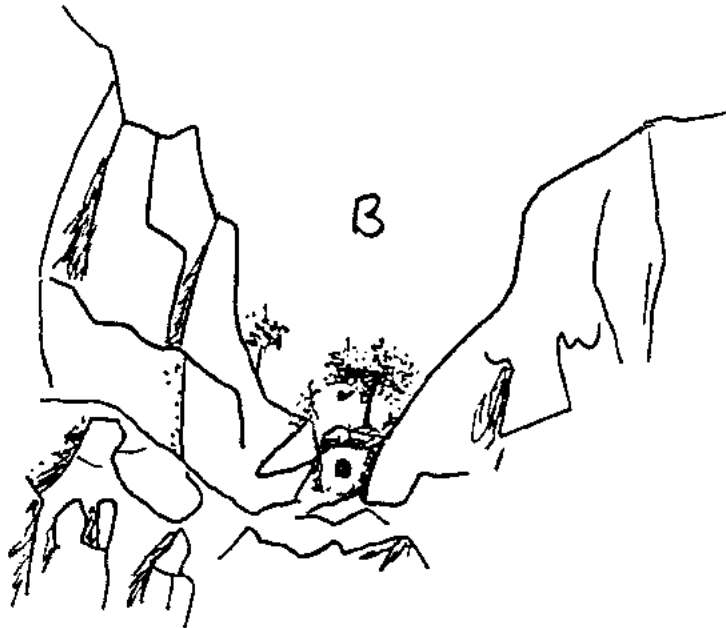
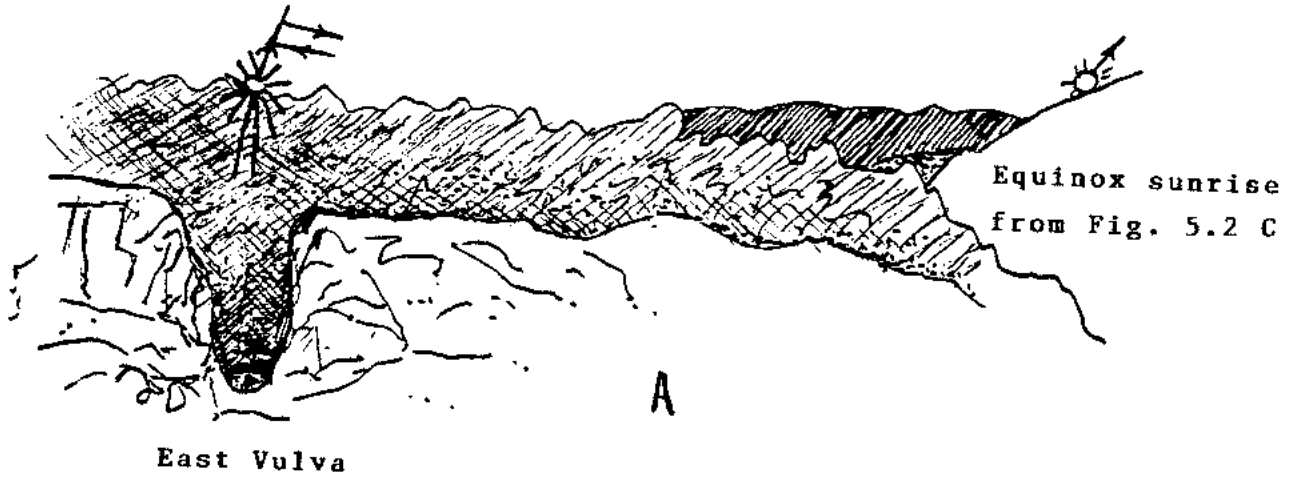
each would be different than that visible on either Equinox or Solstice. This makes it possible that some of these interactions may be predeterminers of solar events for possible ceremonial preparation. Among modern Pueblos these dates were also important to observe.

Figure 5.1B suggested a possible location to observe Summer Solstice sun set since a very distinctive notch can be viewed from it (Fig. 5.1A,a,c). On Summer Solstice, however, the sun set just short of reaching the notch (Fig. 5.1A,b). To get the sun in the notch I had to move around to the other side of the rock with the possible sun watcher (Fig. 5.1D). On that side the rock is unsuitable for inscriptions, but this is the only position where the sun can be viewed to set in the notch from those cliffs. That observation is not as definitive as would be hoped for, but it is usable. To test the validity of that observation it was felt that if the sun could be viewed to rise out of the east notch (Fig. 5.2B), from a marked location it would support the intentionality of the sun set observation. Surveying the other side of the canyon where one would have to be on Summer Solstice for a sun rise position located Figure 5.2C.

This panel consists of four circles in a box-like pattern to the left. Across a small blank space to the right is a sun-like symbol with rays at the top and one line at the bottom enclosed in a box. Above it is a square U-bracket above some vertical random hack marks. To the upper right of these is a circle. The composition does seem to have some possibilities implying sun rise observations. On Summer Solstice the sun rises directly above the east notch from this location (Fig. 5.2A). On Equinox the sun rises far to the right (Fig. 5.2A). The Summer Solstice position marks the left (northmost) limit of the suns movement from the March Equinox position, where it will return back to in September. Martineau, in his Clear Creek Canyon interpretive work prepared under the auspices of the Piute Tribe, refers to these two notches as the east and west vulvas. He interprets a near by panel to relate a story of the sun represented by two personages fertilizing the two oceans. He also interprets another nearby panel to imply the sun rising out of a notch (Martineau 1985). During our last conversations he stated that he did not particularly believe in the validity of solar interactions and that he had not attempted to make any solar observations.

It is obvious that there is a great deal of mythical lore associated with these notches. The east notch does look very much like a vulva. It is very graphic in its natural depiction of a female lying on her back, thighs spread in the receptive position and a natural cavity representing the vulva exposed (Fig. 5.2B). These panels, it seems, could also just as well relate to the conception of the Hero Twins as when the sun entered the daughter of Spider Woman. Natural pits have been considered as vulvas (Tse josh in Navajo) (Magowen 1977, Judy Warner 1984). The natural cavity in Figure 5.2B is probably just as much a vulva as the natural pit in the groin of Figure 5.3A near by. This natural feature is surrounded by a patinated ring and pecked circle. A similar ring occurs on several others (Fig. 5.3C). Since some of these are exaggerated they probably stress the significance or meaning behind their representation (Dalton, Tuchins 1967 personal communications). Since a patinated ring, or a simple circle can represent the sun and many do interact, it brings up the question could this graphically represent the same thing that

Summer Solstice sun rise from Fig. 5.2 C



View of East Vulva from valley floor



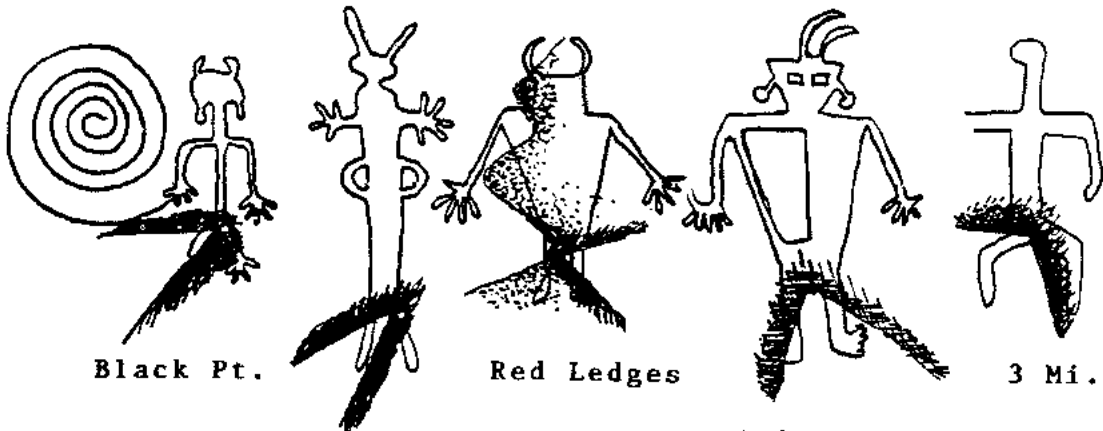
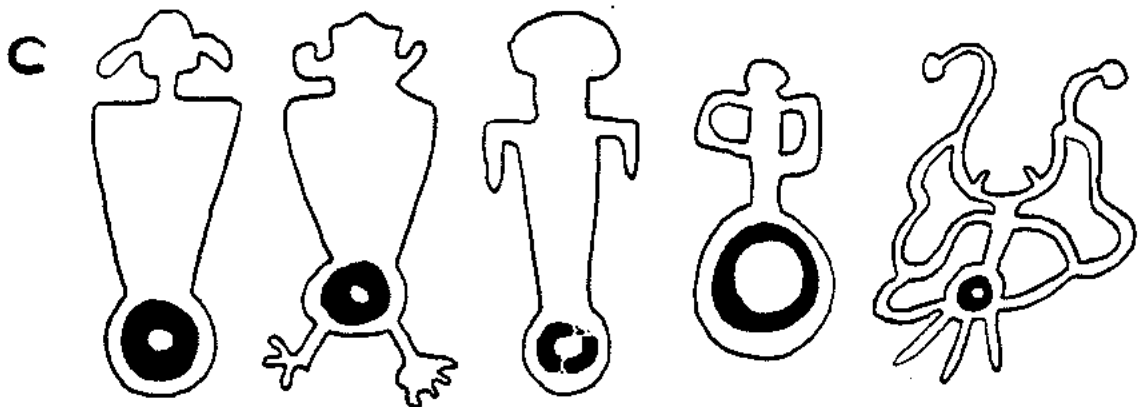
C. Sun rise panel

FIGURE 5-2



Pet. Nat. For. B
Nat. Prk. Ariz.

POSSIBLE "SUN WOMBED" FIGURES



D Quitchupah

Salina Can.

OUT OF GROIN

FIGURE 5-3

is also represented visually (symbolically) not much more than a couple hundred yards away in "Vulva Canyon".

The possibility of it being a sun symbol in the place of the vulva would be highly symbolic and also highly speculative. It was then felt that if it would be possible to find some of these interact, where a shaft of light would come out of that circle like it does the groin of other figures (Fig. 5.3D), that may strengthen the possibility of that concept.

Not all of the observations on these figures have been completed. So far four have been observed. Two performed and it is anticipated that several have a strong possibility to have that interaction. On Equinox an angle of light moves across the face of Figure 5.3A and on the cross quarter date of May 6th that same angle of light moves up into position to penetrate the "Sun vulva". From the fourth figure in the row, the sun was observed to come out of a notch on Equinox. Those specific symbolic applications will be the subject of a subsequent presentation.

After this research began, it was discovered that the copulating couple in the Cave of Life, in the Petrified National Forest, Arizona, had an interaction that relates to this concept. The solid lines were positions of the shadow, but the dotted line was neither illustrated or mentioned, but maintains the same trajectory.

At Kimberly Junction, on Equinox, a Sunheaded Double Entity has a very special interaction. The figure consists of a head with a dot centered circle face with another head, neck and arms extending out of it's head, a Category 2 Double Entity (Fig. 6A). Just before sunset on Fall Equinox, the shadow that comes through what appears to be a man made notch casts a notch of light that brackets the emerged portion of the figure. This is similar, but different to an interaction at Quitchupah where the emerged portion of a Double Entity is also highlighted by bracketing it with light (Fig. 6B). The repatination in the man-made notch is lighter than any of the other surrounding surfaces and the angle of percussion to create this feature was horizontal, in two opposed directions.

The important part of this interaction is that the shadow also simultaneously brackets the dot centered circle Sunheaded face on the lower figure. This type of symbolic interaction was also observed on a figure from Quitchupah during Spring Equinox (Fig. 6C). Later that year on Nov. 6th a similar interaction was discovered on another figure in Emery County (Fig. 6D,E).

The concept of this special context has been labeled "Figures with Double Vision", because one eye, or head, is in the light and the other is in the dark. This seems to symbolically represent the ability of shamen to see and function in both the world of light, the natural, mortal world and the world of darkness, of the supernatural and unknown. So far, there are only three examples of this concept that have been located, all found in the same year. Like all the other important symbols, if they were significant they will repeat again and again.

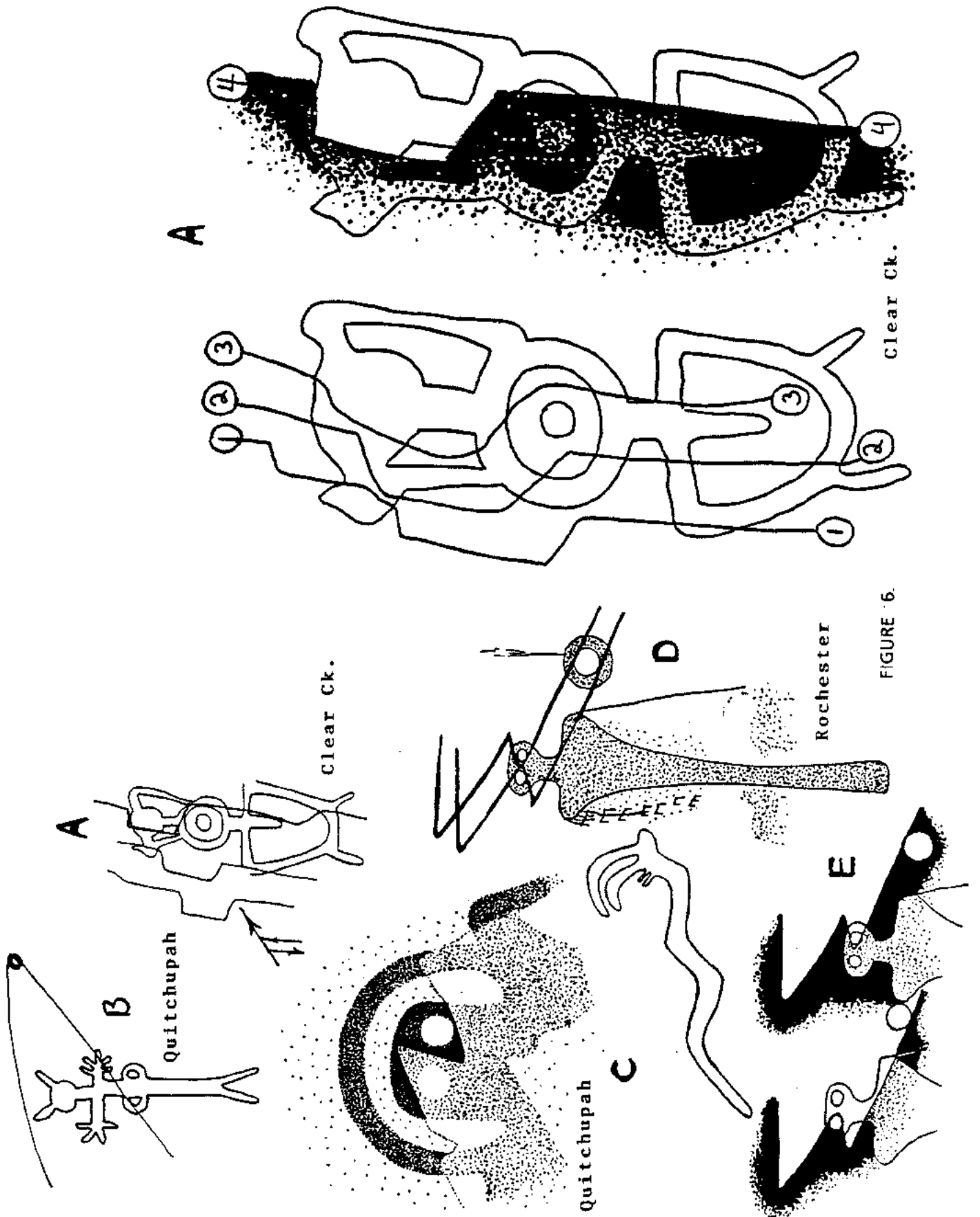


Figure 7.1 contains several figures that are interesting, one of which is a multiple Double Entity. On Equinox as the sun begins to appear out of a notch in the cliff to the right, it casts a corresponding notch of light on the panel (Fig. 7.1X, on line 1). As the sun moves across the small figure with arms and the larger figure without arms the sun appears and then rises out of the notch. That process is registered from line 1 to line 3. Notice the shadow's edge touches the left side of an upper dot at the time it crossed the lower figures' face, providing a line of sight. That type of situation is being found to occur quite often. Also notice the bulge in the shadow that curves around the two horned figurine's shoulder. As the sun moves farther south and lower the point of light (X) will rise at first light. Observe how on Equinox it moves horizontally to the right. At a later date, probably half way to Winter Solstice, it may cross the small figures' face and move to the right to penetrate the center of the spiral.

On Figure 7.1, lines 2 to 4 have a small notch in the shadow's edge that approach and curve down onto the two upper curved claw-like lines of the spiral below it. Notice how they curve right around the angle of the arched lines. When line 3 bisects the lower spiral it cuts across the right eye-like dot in the center of the upper spiral.

The Double Entity beneath line 6 is a complicated figure. Notice the small partial figure-like form attached to the phallus of the long body. The top of the figure is constructed much like the Double Entities in Figure 7.2. Some of these characters have their arms raised up over their heads. In the Clear Creek example, another head with two horns rises up out of the bisected circle formed by the main figures' head and upraised arms. Like the enclosed face at Dry Wash that speaks with light, there is an angle of light that comes from Figure 7.1 line 6. As the edge of the shadow moves to the right notice another angle of light that is similar in shape to the angle of light that crossed the lower face of the main figure, crosses the upper emerging figures' face (Fig. 7.3 lines 6, 8).

Thus this Double Entity has two faces, each sequentially speaks with light on Equinox. This is a rare and unusual situation among figures with those types of contexts. Figure 7.3A is another odd form. Whether it is a Double Entity isn't certain. An angle in the shadow cups a dot on line 2, then moves across the "eyes", and an area that may be in the vicinity of the mouth on Winter Solstice. Figure 7.3B shows the position of Winter Solstice sun rise on the horizon across the canyon from this panel, and the one next to it to the east (Fig. 8A). From Figure 7 Winter Solstice sun rises exactly on top of the mountain peak.

In Figure 8A there is an odd, crudely produced element that seems to have a head and an amorphous body. From that mass of abrasion is an extension with two parallel grooved lines in an extended arm-like position. Because of previous research with figures we refer to as Supplicators, this looks suspiciously familiar. Most Supplicators consist of diminutive characters that reach out toward another more dominant element or toward the horizon and an Equinox or solstitial sun rise or set, like occurs in Black Dragon Canyon (Warner and Warner 1985A).

Eq. Sun rise at line 1-3

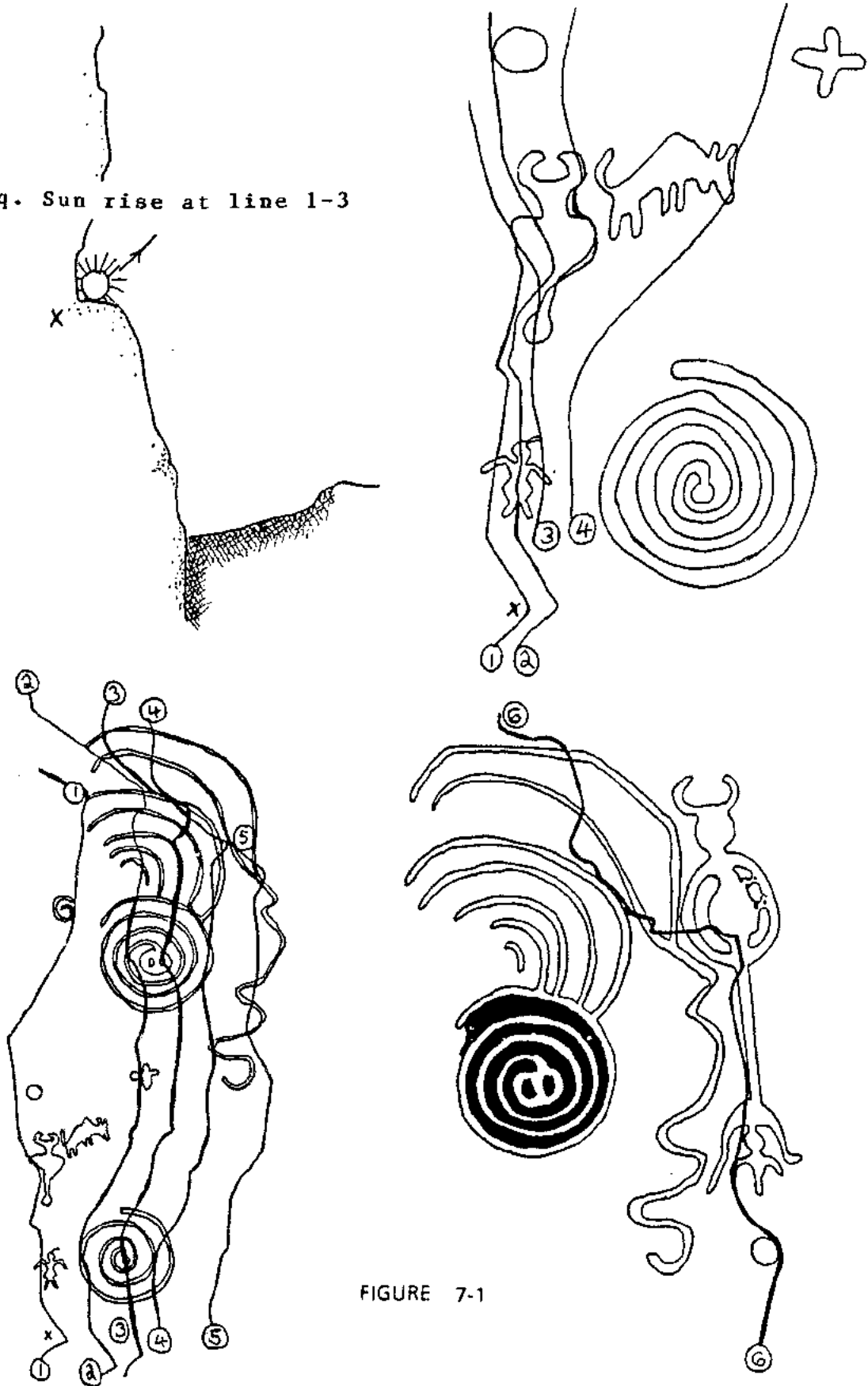


FIGURE 7-1

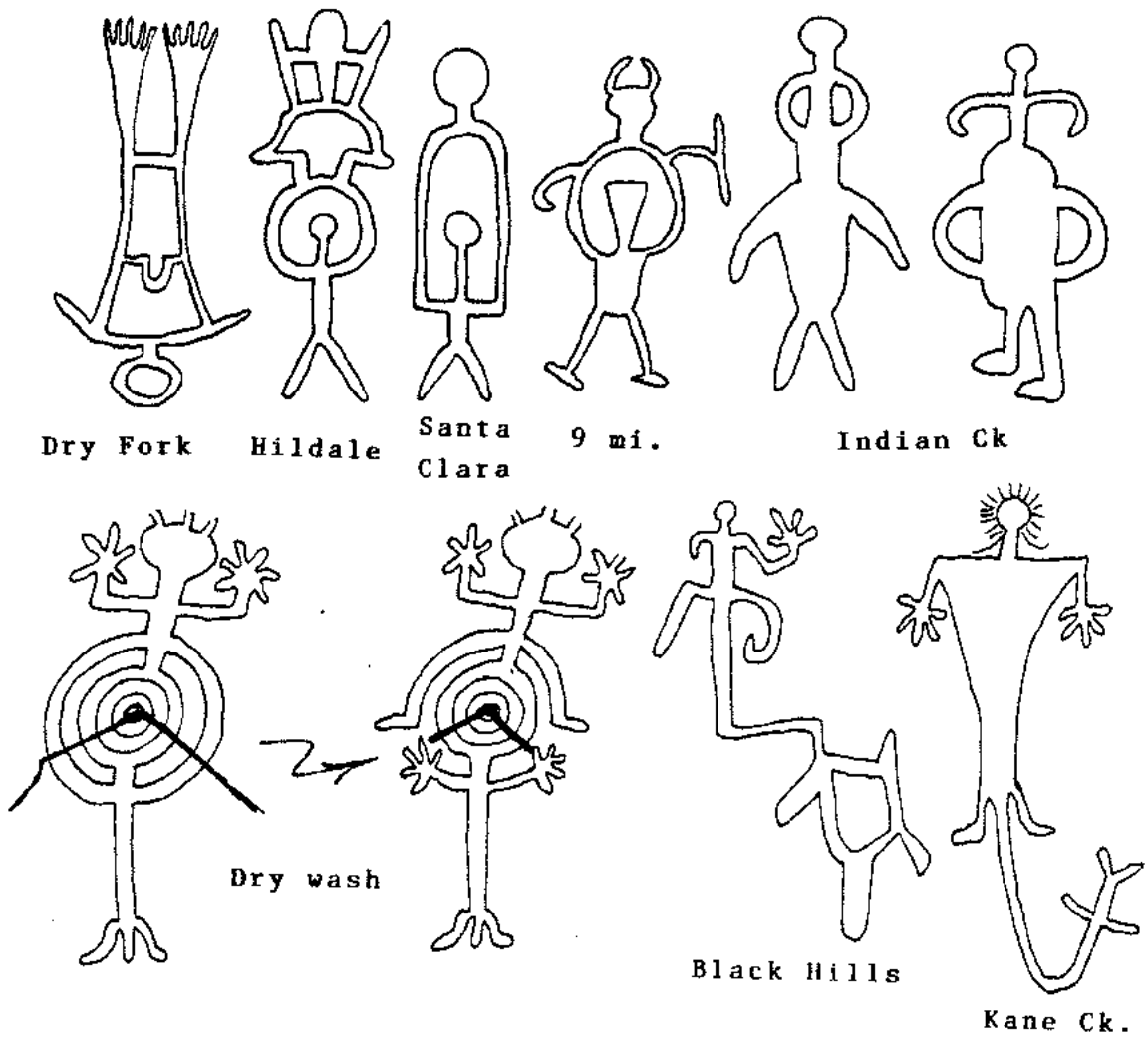
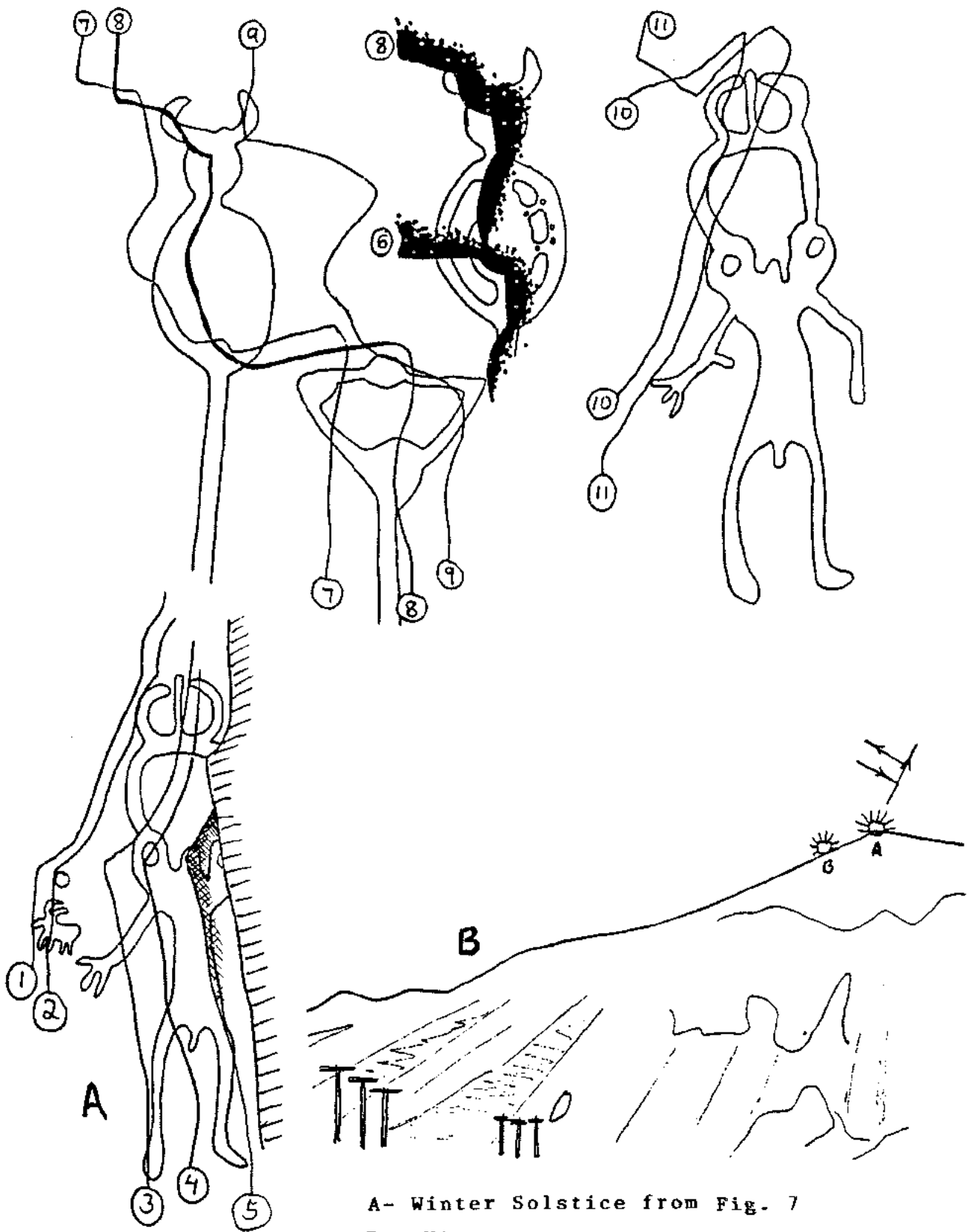


FIGURE 7-2



A- Winter Solstice from Fig. 7
 B- Winter Solstice sunrise from Fig. 8

FIGURE 7-3

On Equinox standing with one's body up against the cliff and looking in the direction that the arms are reaching the edge of the cliff splits a small pinnacle in half. If one's head is next to the figure, on Equinox the sun rises exactly on that pinnacle. So far the anticipated interactions have not been observed on the two spirals. On Nov. 6th another small Supplicater-like creature reaches out toward the the position where the sun disappears into a position on a rather flat cliff (Fig. 8C). In the area where this occurs several more dramatic locations could have been selected, but this is where it occurs. It does reach for the sun, but it is not at its limit so it will pass through the area within the reach of that figure.

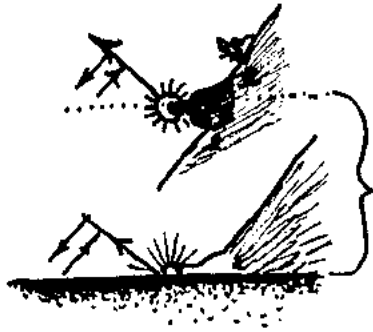
Figure 9A is a U-Bracket faced figure (a variant of a Double Entity) almost identical to the one in Pleasant Creek (Fig. 9C). Both figures have an angle of light cross their faces on Summer Solstice as they look up out of a notch in the cliff (Fig. 9B). Both notches mark the northern limit of the sun's movement. Figure 9D is a four armed, Category 1 Double Entity, that has a triangle of light cross its face on Equinox. These add to the ever growing list of interacting Double Entities, which helps us better understand the connection between the concepts behind their forms and solar observations.

There are two other odd figures that could also relate to interacting Double Entities. One occurs as a simple bisected spiral (Fig. 10A) and the other forms a set of intersected, connected and stacked spirals. Figure 10B, the Bowen panel, has several obvious solar symbols. This panel has been observed to interact on both Equinox and Summer Solstice.

The manner in which it was constructed provides us with the possibility that the vertical shaft that completely penetrates the lower spiral and only enters the upper spiral half way could represent the body of a very abstract figure. Visualizing that at the junction of the shaft and the center of the upper spiral there is a bubular expansion that could possibly represent the head of the shaft-like body. Notice how the first inside revolution from the center of the spiral crosses the "neck" area just below the "head" and forms two arm-like lines which are composed to raise upward and encircle the "head" like those in figure 7.2. Each subsequent revolution crosses the body line to form rings that encircle the head creating both a spiral variant Sunheaded effect, as well as create a rib-like structure and encircling arms for the body in a Double Entity emerging type of situation (Fig. 10C). The lower spiral could be another body duplicating this construction. This would allow the upper spiral-like entity to represent a "Sunheaded" figure emerging from the lower "Sunheaded" figure. Thus repeating some of the symbolism in figures 7.2. This could also duplicate the possibility of the lower figure emerging from the phalus of the upper one.

The fact that the body line of the lower spiral entity extends all the way through and below the last revolution in the same manner as the upper one and to the appropriate distance to provide the legless body terminous effect, supports that possibility. Additional support comes from the fact that the line representing the body stops at the bubular head within the exact center of the upper spiral and does not continue any farther (i.e. through the top). Figure 10A would duplicate the same form.

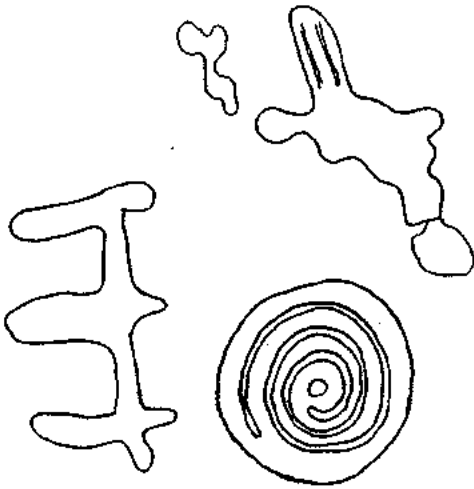
Equinox sunrise



Edge of cliff



FIGURE 8. B



Nov-Feb sunset



edge of cliff

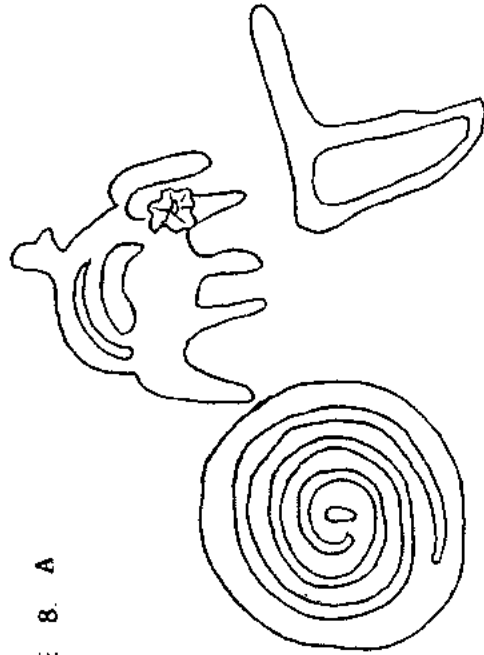


FIGURE 8. A

FIGURE 8. C

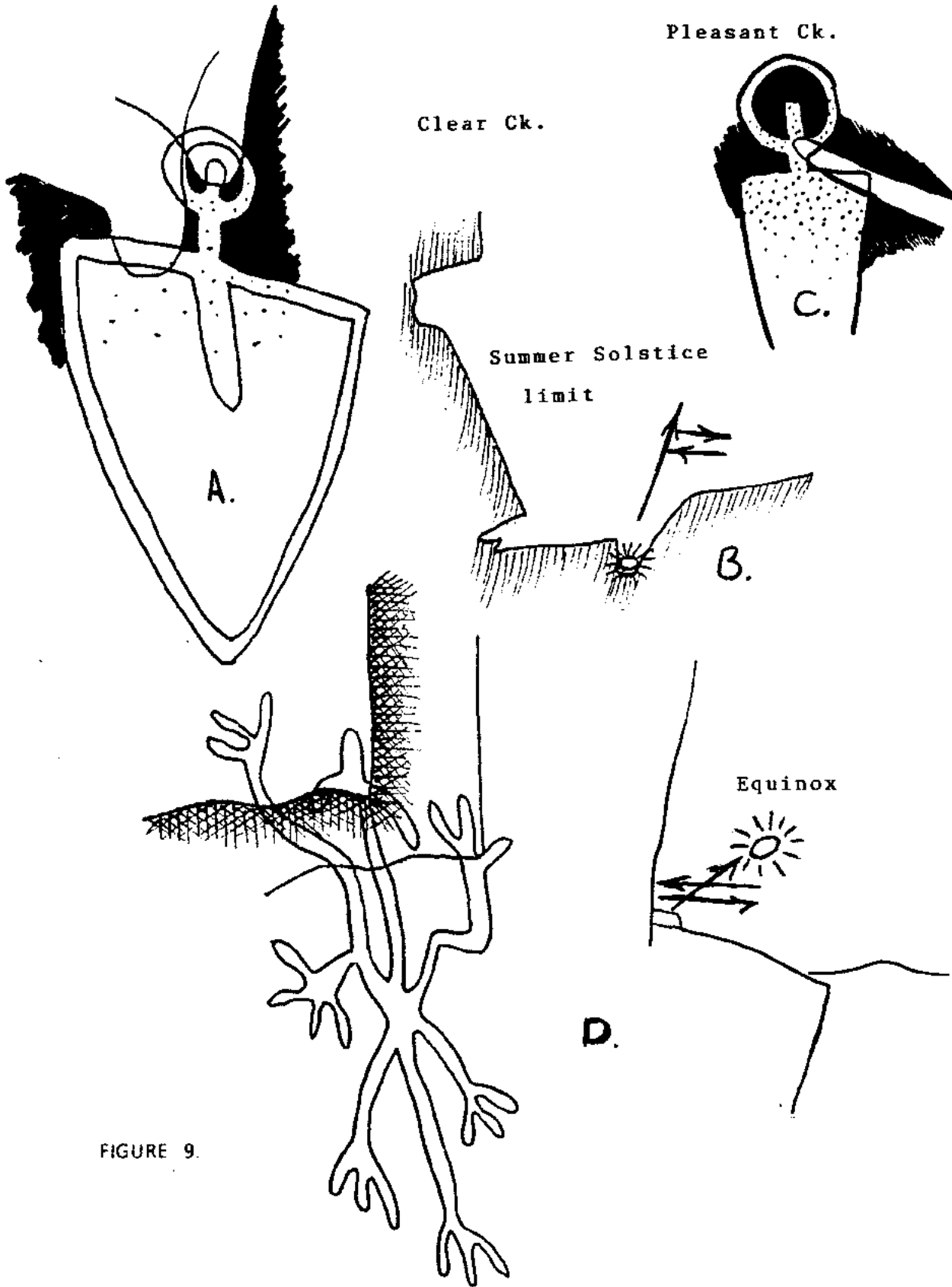


FIGURE 9.



FIGURE 10. A.

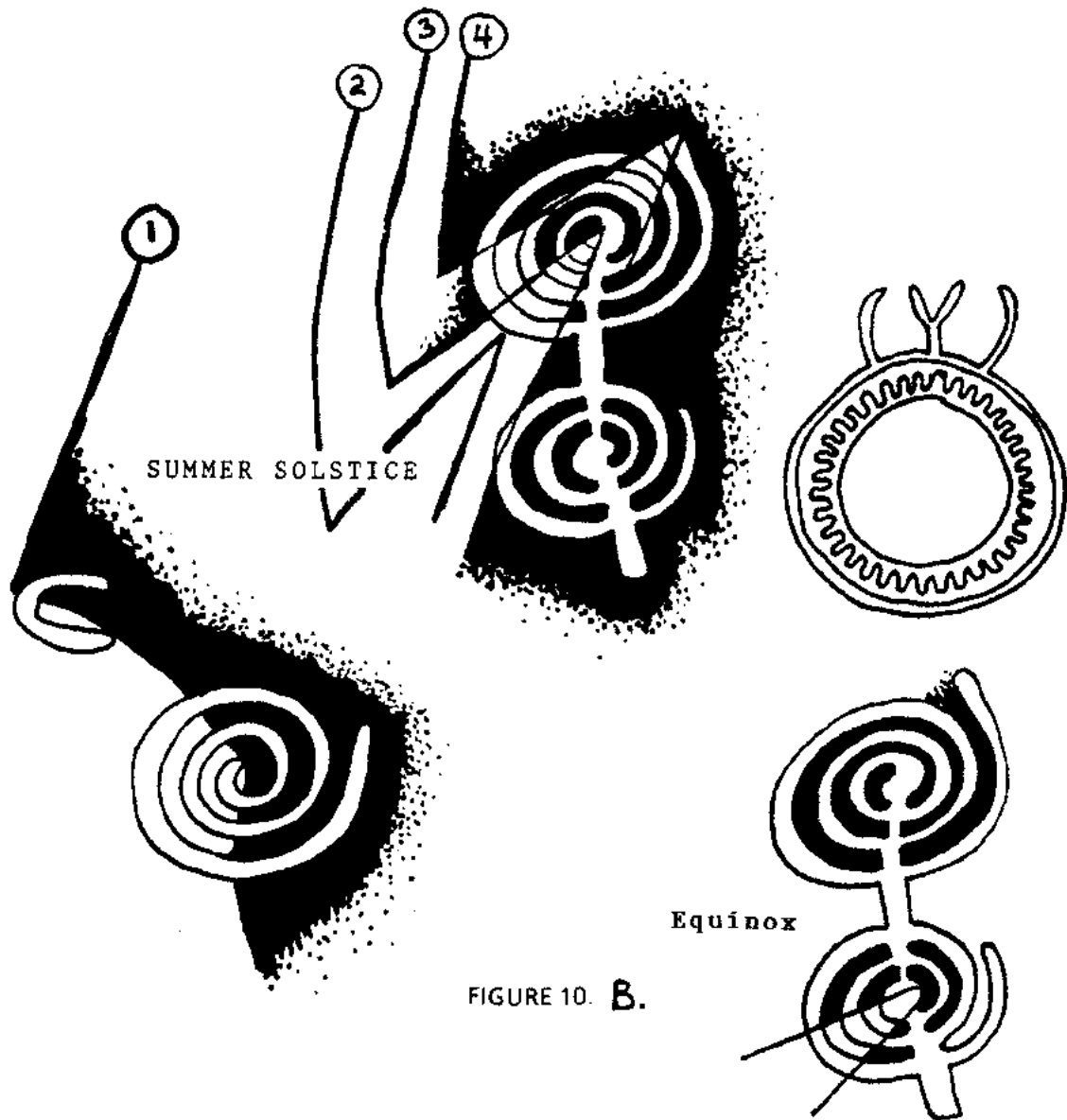


FIGURE 10. B.

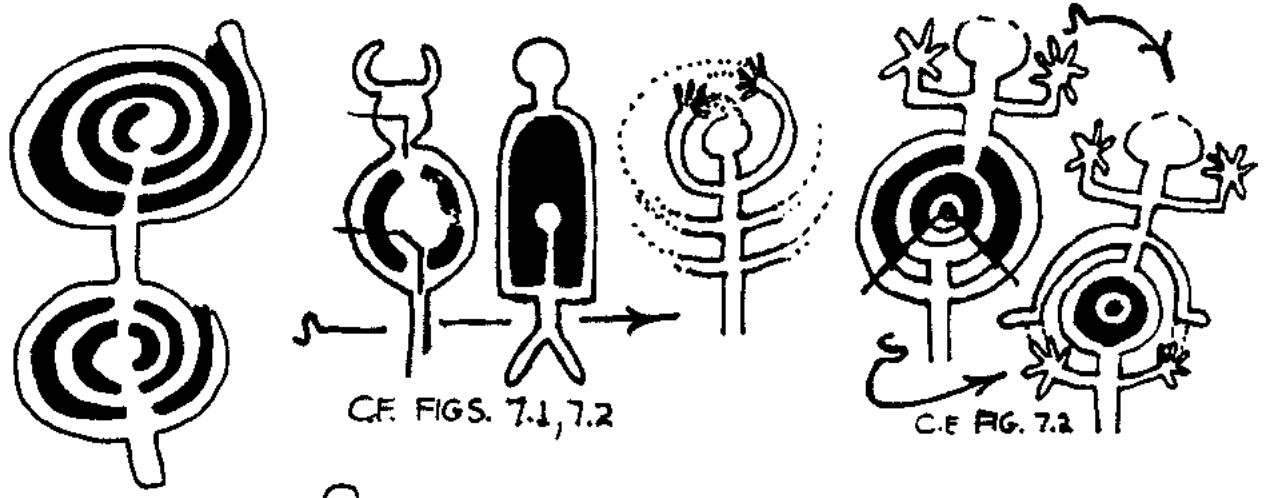
The interactions for this panel occur in figure 10B. On Summer Solstice note the angle of light that raised to touch the head of the stick-like body of a figure that we could say is also speaking with light. This could then provide another example of a figure that possibly used solar observations to possibly trigger his altered state or out of body experience, represented by the doubleness of intersected spirals. The shaft of light that conjuncts with the center of the lower spiral may also mark this concept. Whether or not this complex figure could also be a spiral variant of a Sunheaded Double Entity hasn't been fully determined as yet. Like another possible Sunheaded figure in the canyon that is probably bisected at sunset on Winter Solstice (Fig. 10C, Row 3,A), the head figuratively goes off into a spiral, an accepted solar symbol. The problem is that there could be several different interpretations, and which one is most likely? These spiral headed figures are reminiscent of Figure 10C, Row 3, E), which have the arms of a small legless figure, once leaves the body, encircle itself then become the mouth, nose, and then in spiral form ends in the eye of a figure that has a negative U-bracketed next to its head. That type of U-bracket has been previously discussed as a symbol possibly representing shamanic transformation or ecstatic vision (i.e. one that having seen the light can then speak with it). Compare that with the spiral-like outlines around the cross in Figure 5.3B.

That probably isn't sufficient information to satisfy the questionability of this double spiral figure as being a Double Entity, even though both "speak with light". With that in mind consider the following. Notice in Figure 10B line one, how there is an edge of light and shadow that defines the two figurative worlds, one of light and one of darkness (a familiar symbolism by now). This is the line that these special shamen or men of knowledge walk on. It is only by their commitments that they are able to transverse the balance between these two worlds.

Notice how line 1 on Summer Solstice prior to coming out of the "mouth" of the upper emerging spiral has its edge come out of the center of a U-bracket at the exact moment that it's point touches the exact center of another spiral. This provides a kind of line of sight, from a symbol possibly representing shamanic sight to the center of a sun symbol (C.F. Sec.7 Fig. 4 Dry Wash). Could that represent another symbolic expression of what all these figures have been trying to say. Remember that this marks the limits of the shadows progression, equated with the suns northern limit at that time of the year, causing that alignment to only occur on Summer Solstice.

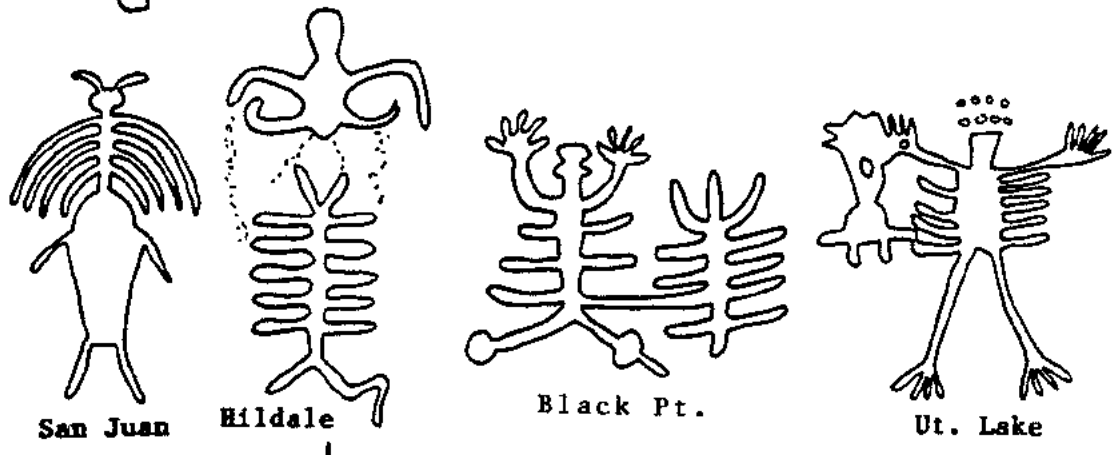
This is an excellent example of the numbers and types of repetitions that are needed to retrieve any reasonable degree of reliability in the interpretive process. Even at this point, the accuracy of the conclusions concerning these concepts on this panel are not certain, but are felt to be fairly accurate. The likelihood that there are other interpretations are possible (Martineau 1985, 81). However, identifying the concept of the double spirals as a variant of a Double Entity is as logical as any other, since it repeats similar forms, in similar contexts, with similar "out of mouth" interactions and the presence of the U-bracket. Even with this greater understanding there are still to many unanswered questions.

Figures 11 and 12 are fairly self explanatory. There are many other



CF. FIGS. 7.1, 7.2

C.F. FIG. 7.2

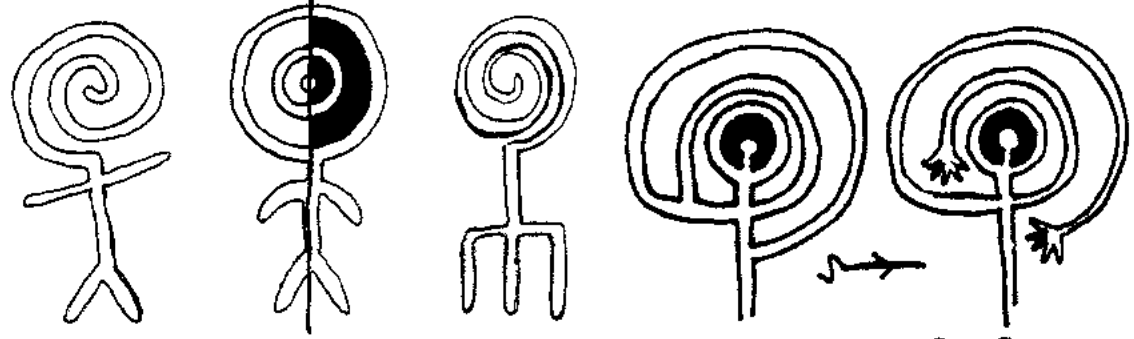


San Juan

Hildale

Black Pt.

Ut. Lake



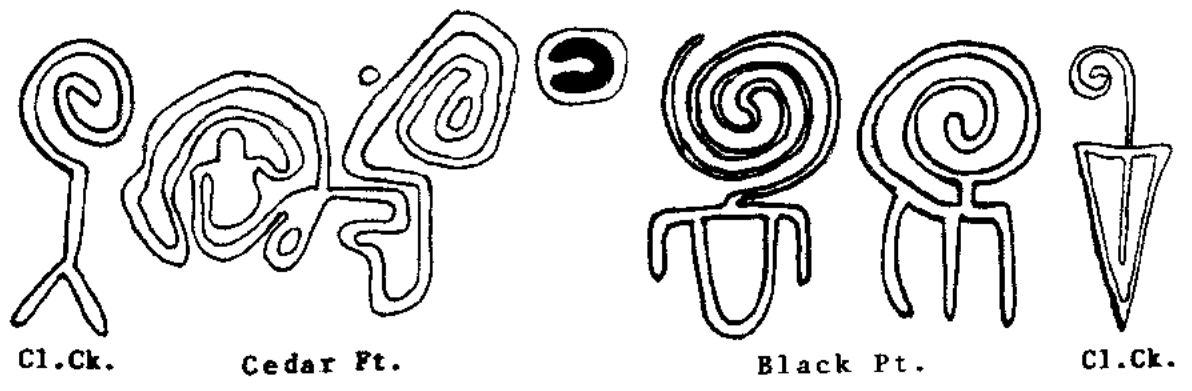
Black Pt.

Molen reef

Sand Is.

St. George

St. George



Cl.Ck.

Cedar Ft.

Black Pt.

Cl.Ck.

FIGURE 10. C.

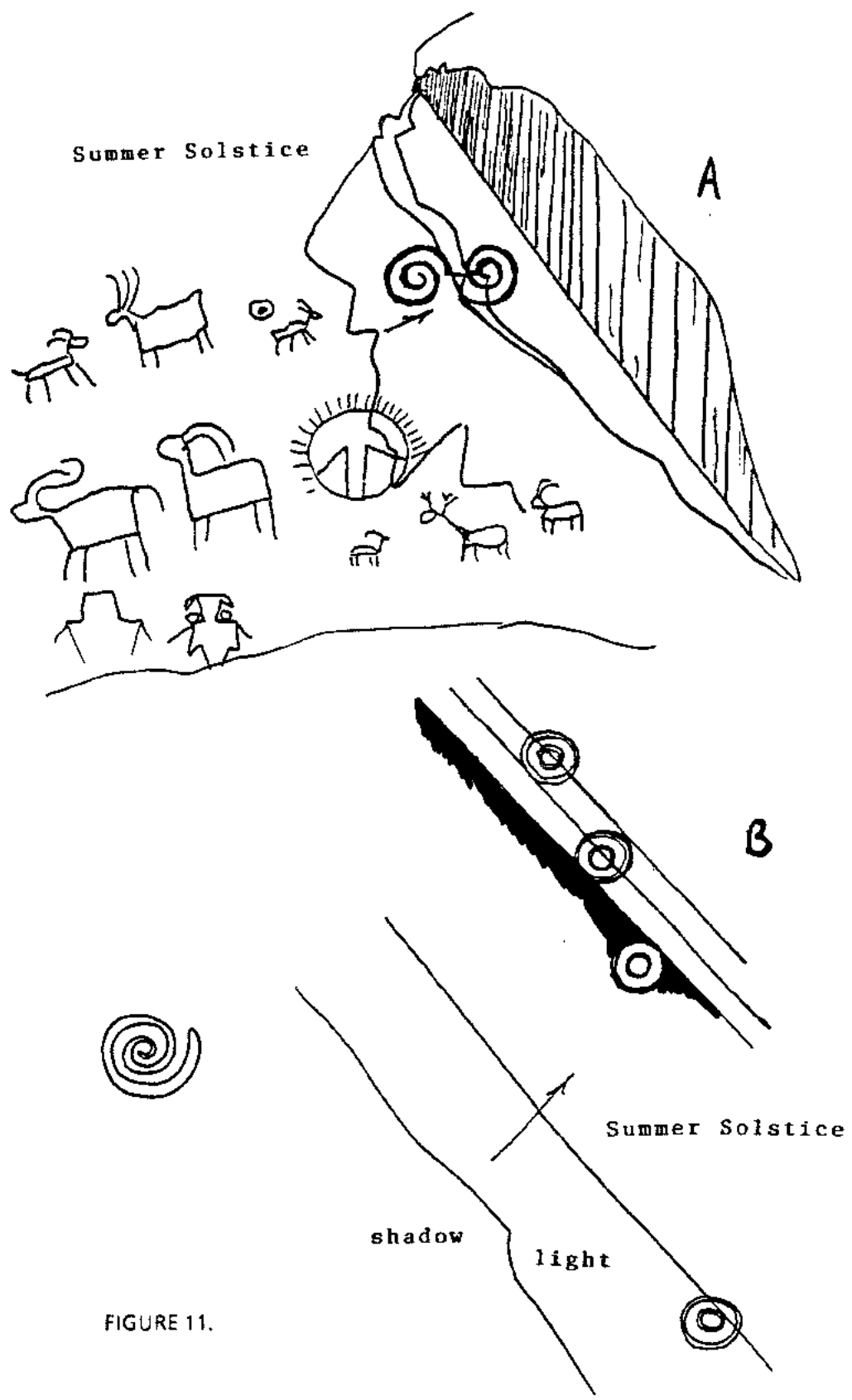


FIGURE 11.

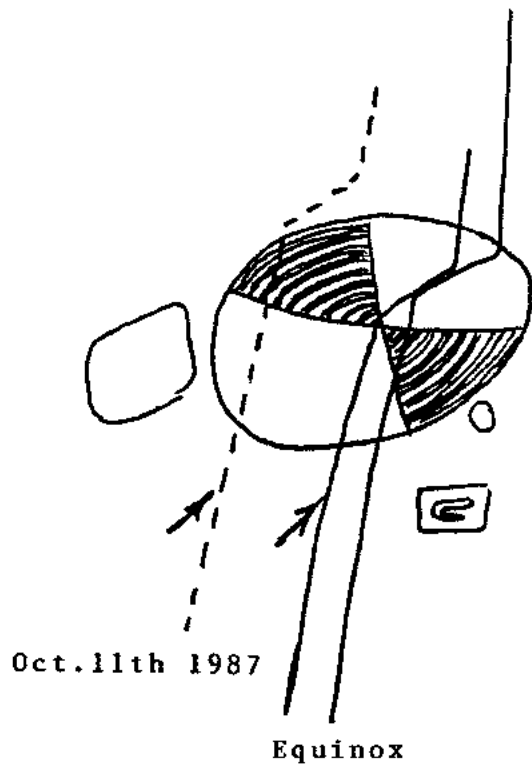
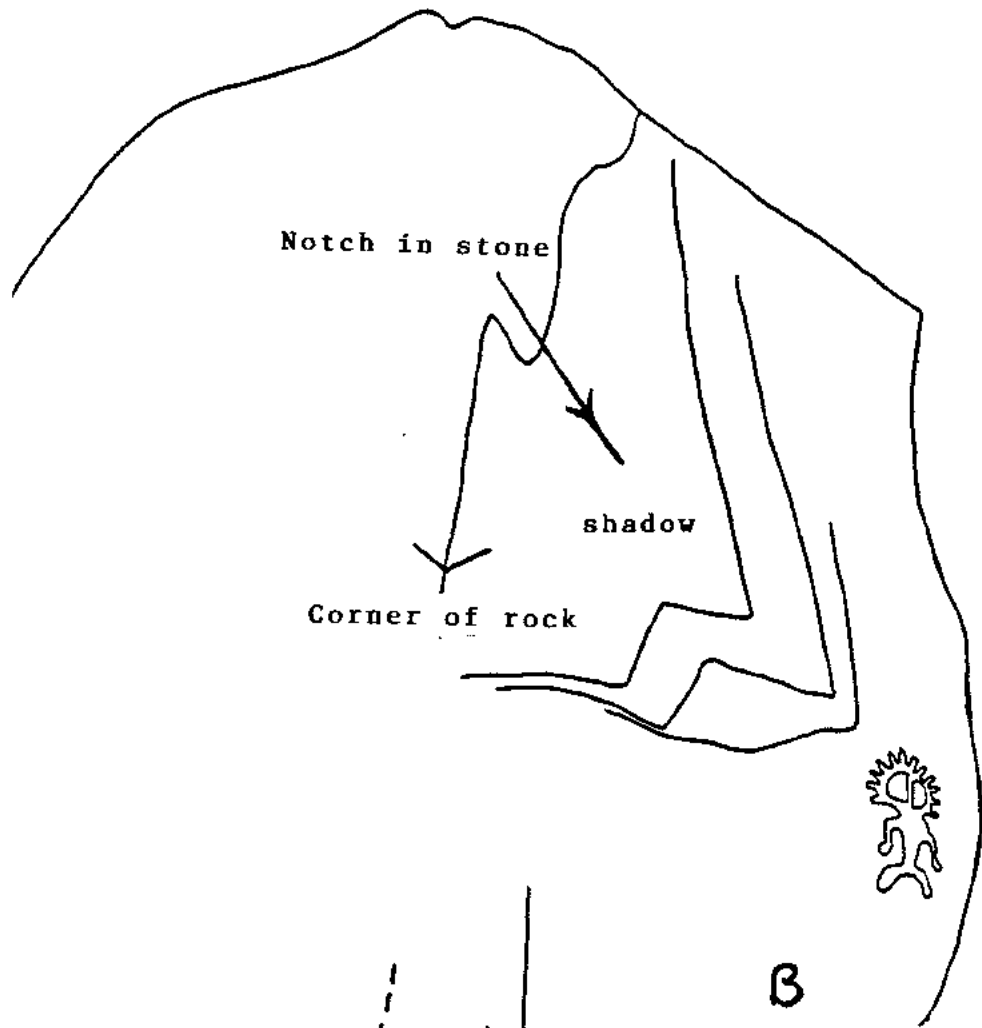


FIGURE 12

panels that have been observed to interact but were not included because more observations are needed to make their total significance understandable. These few illustrations demonstrate the highly developed symbol system present in these inscriptions, where many categories of symbolic solar interaction occur. It will take many years of similar observations to fully understand the total picture, but we are building a fairly good foundation for gaining a greater insight, which is exciting.

REFERENCES

- DALTON, WILLIAM
1967 Personal Communications.
- MARTINEAU, LEVAN
1985 Clear Creek Project
The Paiute Indian Tribe of Utah
Alex Shepherd, Cultural Resources Coordinator
- MAGOWEN, CHARLOTTE
1977 Female Fertility in Rock Art. American Indian Rock Art, Vol VI.
- TUCHINS, HAROLD
1967 Personal Communications.
- WAENER, JESSE and JUDITH S. WARNER
1985 Some Unique Horizontal Sunrise and Sunset Markers In Black Dragon Canyon. Utah Rock Art, Vol. IV.
- WARNER, JUDITH S.
1984 An Intuitive View Of Water Flow, New Mexico. American Indian Rock Art. Vol. X.