

21. GRAVEL PICTOGRAPHS OF THE LOWER COLORADO RIVER REGION

Michael J. Harner

Introduction

The valley of the lower Colorado River is well known for the immense outline figures of gravel which occur on its river terraces. Despite this fact, only a few archaeologists have shown an interest in them, and as a result there is little detailed information available concerning them. This paper is designed to summarize briefly and to note the present state of such information in order to facilitate future research.

The two largest groups of gravel outlines yet discovered are the "giant desert figures" and the "mystic maze." The "giant desert figures" site is located approximately sixteen miles north of Blythe, California, and is clearly pictographic in nature. The "mystic maze" is situated across the river from Topock, Arizona, and like a number of the other gravel constructions of the region, may or may not be pictographic in nature. However, in the light of presently available information, it does not seem practical to attempt to decide which gravel alterations are or are not pictographic. The locations of all known sites are indicated on the distribution map. As can be seen, many such sites have been reported some distance from the lower Colorado River valley, particularly in the California deserts.

"Giant Desert Figures" Site

Undoubtedly the most famous group of gravel pictographs in the entire region are the "giant desert figures."¹ Since the site's first publicized discovery in 1932, it has been designated Historical Landmark No. 101 by the state of California.

Arthur Woodward (1932), with the assistance of the Army Air Corps, was the first archaeologist to study and report on the site. Malcolm J. Rogers (1939) described and published scale sketches of most of the figures at this site² in his broader discussion of gravel pictographs throughout the lower Colorado River basin and the deserts of California. Recently, Frank M. Setzler (1952) has given an account of this group as well as of some others on the river.

While engaged in an archaeological reconnaissance along the lower Colorado River during the summer of 1951,³ I had the opportunity of making some oblique aerial photographs of the site.⁴ The resulting photographs, together with the study of original U.S. Army Air Corps vertical aerial photographs taken in 1932⁵ revealed some pictographic features which have been hitherto unreported.

When the Air Corps aerial photographs were made, twenty years ago, the pictographs appear to have been largely free of vandalism. ⁶ In recent years, however, the site has been a tourist attraction and the pictographic area has suffered accordingly. By consulting these earlier photographs, it has been possible to account for some subsequent alterations and defacements.

The "giant desert figures" are located in Township 4 S., Range 23 E. on terraces typical of the valley of the Colorado River in its course forming the boundary between Arizona and California.

The pictographs at the site are on the flat gravel-covered terraces which are approximately fifty and seventy-five feet above the river flood plain, and are almost free from erosion. The site, however, is split by a sharp gully which forms a small ox-bow bend off the main flood plain. In addition, numerous washes extend down from the Big Maria Mountains in the west and cut sharply through the terraces adjoining the site to end abruptly at the flood plain. Due to the infrequency of rainfall in this desert climate, the washes are mainly channels for flash floods. Vegetation on the arid terraces of the site is limited mostly to sparse scrub brush, in contrast to the river flood plain below where there is a profusion of vegetation, including important food-bearing species, such as mesquite and palo verde.

Possibly the most striking characteristic of these river terraces, especially at this site, is the dark mahogany-like luster which coats the surface gravels, especially on their upper sides. This coating is commonly called "desert varnish." This is by no means an unusual occurrence, for desert varnished gravels are typical of the terrace surfaces along the lower Colorado River. However, the desert varnish on the gravels at this site is above average in darkness for the general area, and viewed from the air, is differentiated from the neighboring terraces as an irregular patch of darker brown. The pictographs, in turn, contrast distinctly with this dark brown background as yellowish gray figures. This is because they were formed by removing the surface gravels to reveal the almost pebble-free sand immediately underlying the two or three inches of surface gravels.

A total of at least seven figures at this site were constructed in this manner. ⁸ Three humans, two four-legged animals, and two spirals are represented. These figures are grouped at three different locations on the site, indicated as A, B and C. These groups are separated by the following estimated distances: A to B, 3000 feet; B to C, 2700 feet; A to C, 2300 feet. The locations of these groups correspond more or less to the largest and darkest desert varnished gravels in the area and may have been selected for that reason.

The accompanying overall sketch of the area was taken from an oblique photograph, and accordingly furnishes only a rough approximation of the relationship of these groups to one another. The individual drawings of the three groups, taken from both vertical and oblique photographs, as well as from observations and measurements on the ground, are to scale as indicated.

Group A. This group is on the higher (seventy-five foot) terrace. It consists of representations of a spiral, a quadruped (both larger than their counterparts in Group B), and a human (larger than the human figures in Group B or C).

Due to its less accessible location, it is the least damaged of the three groups.

All of the three figures in this group were made by clearing away the surface pebbles. The human and quadruped pictographs are both outlined by the scraped-up pebbles which form ridges up to 4 inches in height (the spiral has no ridges). The present upper sides of the gravels in these ridges have the greater density of desert varnish. The length of the anthropomorphic figure is 167 feet.

On the scale drawing, the single dot in the head of the quadruped figure, the four dots in the head of the human figure, as well as the two appearing to represent breasts, indicate the locations of white boulders. Although not all of these boulders are actually visible in the 1932 photographs, Woodward (1932, pp. 378-9) reports their presence when he visited the site shortly after the aerial photographs were taken. These boulders lack desert varnish on their exposed surfaces, but this does not necessarily mean that they are recent placements, as boulders of the same material scattered a few hundred feet away from the pictographs also all lack desert varnish. Whether the boulders placed upon the pictographs are part of the aboriginal construction remains a matter of speculation (see note 3, this paper).

Faint lines, apparently scratched in the gravel, extend to the sides from the head of the human figure and appear to indicate hair strands.

The dotted area in the pubic region represents the shape of a pile of pebbles 7 inches high. Their present upper surfaces have the preponderance of desert varnish.

Digits of hands and feet number five, when discernible.

The crisscrossed lines in the upper right hand corner of the drawing are very faint and are typical of the innumerable and generally illegible pictographic striations distributed widely on the river terrace gravels.

Group B. This group, also of three figures, is on the lower, or fifty foot, terrace. The human, the quadruped and the spiral pictographs were all constructed by clearing off the surface gravels, like those of Group A. Likewise, the spiral here lacks the gravel-ridged borders of the other two figures of this group. The gravel ridges, desert varnished mainly on their exposed surfaces, are 2 inches high and no doubt were higher before being trampled by dull-witted sightseers who have obscured the outlines of this pictograph group more effectively than either of the other two.

The length of the human figure, from the top of its head to the base of its longer leg is 92 feet 8 inches.

Faint lines, probably representing hair, extend from the sides of the head. Digits are five, where distinguishable.

Although not visible now, due to recent defacement, Rogers (1939, p. 15) mentions a pubic cavity: "the sex is represented by a small elliptical hollow of cobbles."

The human representation is clearly superimposed upon the circle which encloses the bulk of its body, as Rogers (1939, p. 15) points out. This circle lacks marginal ridges and thus closely resembles the appearance of the aboriginal trails of the region.

The other lines reproduced in the drawing may or may not be related to the more imposing pictographs. In cases where they are somewhat indistinct, the probable course is indicated by dots. The small rough circles represent areas where the sandy soil lacks the usual superincumbent layer of gravel.

Group C. This group is also on the fifty foot terrace. It consists of a human figure and two short crossed lines. Rogers (1939, p. 16) reports an additional figure in this group:

"There is, however, one other pattern on the same mesa, which lies forty-five feet southwest of the right arm of the man's figure. It is a very indistinct intaglio pattern, probably much older than the main structure. It is an animal delineation with a stocky body, a tail, four legs, and head which resembles a big-horn sheep, and measures seventeen feet from the tip of the tail to the end of the nose."

Neither Woodward nor Setzler reports the existence of this representation. After a careful examination of the 1932 and my 1951 aerial photographs, as well as examination on the ground, I was unable to discern any evidence whatsoever of such a figure. In addition, every detail of variation in the tone of the desert varnished gravels which was discernible in the earlier photographs of Group C was recognizable in the later ones.

Like the human figures of the other groups, the one here is outlined by a ridge of gravels about 3 inches high. The greater proportion of desert varnish is on the present upper surfaces of the pebbles in the ridge.

The figure is 105 feet 6 inches in length from the top of the head to the end of its longer leg. As is the case with the other two anthropomorphic figures, this one has lines which probably depict hair stretching out from the head. The pubic area contains a mound of pebbles whose present upper surfaces are the more heavily desert varnished, as in the case of the human pictograph in Group A. The maximum height of this mound is 5 inches.

Digits on hands and feet are five, as is the case with the two other

human representations.

The round lines indicate cleared circles similar to those which occur in Group B and elsewhere sporadically on the terraces of the lower Colorado River.

The anthropomorphic and quadruped figures of all the three groups at this site have their heads, torsos and limbs outlined by the raised borders of gravel. As has been previously noted, the gravels in these borders, like the undisturbed gravels on the surface of the terraces, are coated with desert varnish.

One of the most interesting characteristics of the gravel in these borders is that the desert varnish on the present upper (or exposed) sides of these pebbles is always darker than the coating on the under (or unexposed) sides. This is the same situation that obtains wherever desert varnished gravels lie in an undisturbed state. Since it seems safe to assume that a good proportion of the pebbles were overturned (many are less than an inch in diameter) in the process of forming margins, one must conclude that the gravels were scraped into ridges sufficiently long ago to permit subsequent redistribution of the desert varnish coating.

Obviously the length of time necessary for the formation of desert varnish depends upon numerous variables. The considerable variation in darkness of the desert varnish on the terraces adjacent to the "giant desert figures" site is testimony to this fact. Also, the research of Laudermilk⁹ indicates that in at least some cases, there is a maximum of coating which may be achieved.

Keeping such facts in mind, it should nonetheless be noted that a Yuman¹⁰ pottery jar and sherds from the vicinity of Yuma exhibit what appears to be desert varnish.¹¹ Since the ceramic chronology of the lower Colorado River valley is as yet little known, this information can only indicate the possibility that the "giant desert figures" were made after ceramics had entered the area.

The uniformity of style of the anthropomorphic and quadruped representations suggests that they were constructed contemporaneously. Consequently, if one considers the quadrupeds to be horses, then all five figures can be considered to be historic, probably along with the accompanying spirals. This is the conclusion reached by Setzler (1952, p. 404). However, these figures may depict some other quadruped; for instance, a coyote, wolf or dog. 11a

As to the sex of the anthropomorphic figures, the representation in Group C is male if the mound of gravel is considered a phallus; the figure in Group A is more complicated, in that it has both a pubic mound and boulders in the breast positions. The guess of this writer is that if the pubic mounds are phallic representations, then male gender for this figure is more likely than female; for the pebbles in the pubic mound have desert varnish on their upper surfaces to vouch for their age, while rocks representing the breasts are of a type which does not accumulate desert varnish. If the breast boulders are contemporaneous with the rest of the pictograph, including the pubic mound, it is this writer's guess that the

conclusion that the figure is male or bisexual is more logical than that it is female.

The human figure in Group B, as noted previously, is rather defaced at present, but Rogers describes a pubic depression which he considers indicative of female sex.

Faint details not readily visible to an observer on the ground often show up with much greater clarity in the aerial photographs, especially those taken from a vertical angle. Among such details is the small cross scratched in the gravel in Group C. To interpret a cross, even an elaborate Maltese cross such as Setzler (1952, p. 401) found at Site No. 1 Ripley, as evidence of historic construction seems hazardous. For instance, the prehistoric pottery this writer has excavated in the lower Colorado River region sometimes exhibits cruciate decorations.

Among the least obvious details are the slightly wavy lines scratched away from the sides of the heads of all three of the anthropomorphic figures, and which appear to be a representation of hair style.

Comparison is warranted with the description given by Kroeber (1925, pp. 729, 782 and plates 64-5) of the mode of hairdress among the historic Mohave and Yuma:

"Men wore, and sometimes still wear, their hair long, rolled or rather pasted into 20 or 30 ropes about the thickness of a lead pencil. The greater the mass of these strands hanging down the back to the hip, the prouder the owner. The women trim the hair square above the eyes and let the remainder flow free, spread out over the shoulders."

Accordingly, the hair style represented in the pictographs is not dissimilar in its appearance to that of the historic Mohave and Yuma of both sexes. ¹²

Associated with the pictographs at this site, as Rogers (1939, p. 15) reports, are occasional San Dieguito I ¹³ lithic materials. But since such San Dieguito I materials are scattered on most of the desert varnished river terraces of this region, one appears justified in concluding that the association does not necessarily indicate contemporaneity. Rogers (1939, p. 15) also notes that some of the San Dieguito I artifacts occur in the raked-up gravels outlining the pictographs. This writer likewise found this to be the case. In addition, material evidence of archaeological Yuman culture also seemed lacking at the site.

Other Anthropomorphic Gravel Pictograph Sites

As noted in the section of this paper dealing with the "mystic maze", there have been reports of the existence of one or two anthropomorphic

gravel pictographs at that site. However, no details are available; and may not be forthcoming if such a figure (or figures) was destroyed.

Another possible anthropomorphic gravel pictograph site may exist near Picacho, California, some fifty airline miles south of the "giant desert figures." This new site, according to a Blythe flying instructor,¹⁴ includes human and quadruped forms as well as "a sun with radiating lines." However, he could not recall its specific location. The inhabitants of Picacho told me that they were not aware of any such figures. Consequently, information regarding this possible site awaits additional fieldwork. The flyer also said that this was the only gravel pictograph site containing human representations (besides the "giant desert figures" site) that he had sighted in more than fifteen years of flying up and down the Colorado River, as far south as Yuma and north to Needles.

Setzler (1952, p. 401), however, reports two additional anthropomorphic gravel pictograph sites not far from Blythe. The first of these, his Site No. 1 Ripley, is described as "a figure with arms akimbo which proved to be 50 feet long. Another giant, a little to the north of it, measured 118 feet from the left shoulder to the edge of the cliff, where erosion had lopped off its feet." An oblique aerial photograph of this site is included in Setzler's article. The first figure referred to is clearly anthropomorphic, and interestingly, appears to be stylistically different from those at the "giant desert figures" site (Setzler's Sites No. 1, 2 and 3 Blythe). Also at this site is the figure resembling a Maltese cross. The second figure Setzler mentions is also of interest for it closely resembles the sketch made by Rogers (1939, plate 22, figure 3) of a pictograph at the "giant desert figures" site which is now virtually illegible (see note 1, p. 7, this paper). Rogers (1939, p. 14) does not hazard a guess as to what this figure represents. This perhaps is the best course of action as regards the similar figure at Site No. 1 Ripley, rather than considering it to be anthropomorphic.

Setzler's second new anthropomorphic pictograph site is designated as Site No. 2 Ripley. Like the previous site, it is described as being located on the Arizona side of the river opposite Ripley, California. Setzler says the site "held another human effigy of the intaglio, or scraped, type similar to those at Blythe (the 'giant desert figures' site). About 36 feet north of its head lay a beaten circle some 48 feet in diameter."

Another gravel pictograph site which may have anthropomorphic representations is reported by Bourke (1889, pp. 172-4) to be located on a terrace of the Colorado River near the Nevada-California boundary. Bourke's account is of particular interest because he was taken to the site by a Mohave who associated the site with a creation myth. An excerpt of this account follows:

"On the gravel mesa, overlooking this field, was an insignificant stone-pile, which Merryman [his Mohave informant] said had been placed there by Mustam-ho, otherwise called Pa-o-chash, the god, son of Maty-a-vela. The Colorado River was then very high,

and came up to the crest of this bluff. Mustam-ho was the god of water. He ordered that every man and animal should swim, diving into the river from this point. This was no doubt the place where formerly dances and games had been held by the Mojaves to celebrate the recession of some abnormal spring flood of the Colorado. The lustration described was possibly a kind of sacrifice to propitiate the angry god of waters, Mustam-ho, who, Merryman said, 'made all the waters.' The stone-pile was exactly like the Apache sacred stone-heaps, the Tze-na-a-chie. I am pretty sure my conjecture is correct because Merryman said that before engaging in these games every Mojave had to purify himself in the sweat-bath.

"A hundred yards or so from this point was a flat-topped, rocky mesa, known as Mat-ho-ko-sabbi,¹⁵ or 'the place or land of holes in the nose,' because here once all created life met to engage in games of running, jumping, swimming, and walking. All the birds had holes bored in their beaks. The duck came last. 'Your nose is too flat,' said Pa-o-chash, called the Judge, because he is the judge of all actions of men or animals, here or hereafter. 'I can't help that,' said the duck, 'I was born so; I must have a hole in my nose like the rest; I wouldn't look pretty without it.' The Judge consented and the hole was bored. Then men came up. The Judge said: 'I don't bore holes in flat noses. No flat-nosed creature, except the duck, can have a hole in his nose. A flat-nosed man wouldn't look pretty.' After that, the animals ran round in a circle. The duck and dove both ran and flew and so came in ahead; the horned toad ran until out of breath, and then stopped.

"(This was evidently the site chosen by the Mojaves for the celebration of their Creation Dance, or dramatic representation of their myth of the creation. Here was an irregular, elliptical curve, marked with small heaps of rock . . . , at distances of from five to twelve paces, each designating the point where, according to Merryman, some animal . . . had broken down in the course which was run with the Sun, from left to right. Where the big medicine-man representing the Judge was to stand was marked thus: [sketch of a figure resembling an inverted U with the open end closed with a straight line] and near this on the ground was traced a hieroglyph, the meaning of which Merryman was unable to give, but which bore some slight resemblance to the figures of a man, a woman, and a child, or of three grown persons tied together, . . .)" [sketch of three figures, each shaped like an X with the top and bottom ends closed by straight lines, and linked together by a straight line through their centers.]

The foregoing account, of course, does not demonstrate that the Mojaves necessarily were the constructors of this rock representation, and leaves doubt as to whether the construction preceded the myth or was an outgrowth of it. Also there is the possibility that Merryman's explanation for the site may be based upon a personal dream, rather than representing a shared belief. ¹⁶

Some one hundred miles east of the Colorado River another anthropomorphic pictograph site is reported near the Gila River by Frank Russell

(1908, p. 254 and fig. 102). His full account of this site is as follows:

"Hâ-âk Vâ-âk, Hâ-âk Lying,¹⁷ is a crude outline of a human figure situated about 5 miles north of Sacaton. It was made by scraping aside the small stones with which the mesa is there thickly strewn to form furrows about 50 cm. wide (fig. 102). The body furrow is 35 m. long and has a small heap of stones at the head, another at a distance of 11 m. from the first, and another at the junction of body and legs. The latter are 11 m. long and 1 m. apart. The arms curve outward from the head and terminate in small pyramids. In all the piles of stone, which have a temporary and modern appearance, are glass beads and rags, together with fresh creosote branches, showing that the place is yet visited. The beads are very old and much weathered. Beside the large figure is a smaller one that is 4.5 m. long, the body being 2.7. Hâ-âk is supposed to have slept one night at this place before reaching Hâ-âk Tcia Hâk, a cave in the Ta-atukam mountains, where she remained for some time."

Woodward (1932, p. 378) and Setzler (1952, p. 404) note this report. The latter, in addition, apparently feels that the evidence is sufficient to conclude that the pictograph was constructed by the Pimas. On that basis, he postulates that the anthropomorphic gravel pictographs of the Colorado River valley were connected with a Hâ-âk Vâ-âk tradition; that the Yumans of the Colorado River shared the tradition with the Maricopa of the Lower Gila River; that the Maricopa passed it on to the Pima; and that the Pima "preserved the myth long after the Yuma had forgotten about it."

Actually, however, Russell does not commit himself as to whether these figures were constructed by the Pimas themselves. That they were the subjects of offerings by the historic Pimas is evident ("fresh creosote branches"). It is also evident that some of the offerings were of considerable age ("The beads are very old and much weathered"). In a previous paragraph, Russell (1908, p. 254), referring to a local petroglyph, says:

"This was probably a Hohokam¹⁸ shrine, though it is regarded with reverence by the Pimas, who still place offerings of beads, bits of cloth, and twigs of the creosote bush at the foot of the large pictograph."

Since Russell himself indicates that the Pimas placed offerings at petroglyphs which they may not have made, it is not at all impossible that they were doing the same thing at the gravel pictograph site. As in the Mohave case cited previously, the fact that members of a culture have a myth concerning a pictograph is no proof per se that the pictograph was constructed by earlier bearers of the same culture.

In addition, there is extensive historic evidence that the populations of the valleys of the lower Colorado and lower Gila rivers shifted their locations considerably after the arrival of the Spanish. Possibly this also was the case in prehistoric times.

"Mystic Maze" Site

The "mystic maze" ¹⁹ is the largest contiguous gravel construction reported from the area. Often called the "Mohave maze." it is situated on the California side of the river about one mile west of Topock, Arizona. As Malcolm J. Rogers (1939, p. 10) points out:

"Despite the popular name there is nothing of a maze or labyrinthine nature about it. It is composed of parallel windrows of cobbles with an average spacing of five feet. This structure which has an area of eighteen acres, covers the entire top of a T-shaped piece of mesa land."

The aerial photograph ²⁰ of the site tends to support Rogers' view that the name "maze" is a misnomer. Rather, it appears that the site consists of probably three groups of roughly parallel ridges of gravel. In the photograph, the group of parallel ridges at the top appears to be superimposed upon the group in the middle of the photograph; and the group in the middle likewise seems to be superimposed upon the group at the bottom.

These ridges of gravel average between five and eight inches in height.

A particular gravel pile at this site is considered by Rogers (1939, p. 10 and plate 2) to be a phallic representation. However, it does not seem to be discernible in the aerial photograph (which, it should be noted, does not encompass the entire extent of the "maze").

Although the site is often referred to as the "Mohave maze," A.L. Kroeber ²¹ recalls that in the early 1900's he was told by a Mohave informant that although the Mohaves were aware of the existence of the "maze," they did not have any cultural traditions associated with it. Kroeber says that he does not believe that his informant was attempting to conceal information.

The following account is given by A.H. Schroeder (n.d., p. 44):

"Mrs. B.B. Brown of Parker relates the following information she obtained in 1910 from the Mohave Indian, Chuck Wood, who was over 100 years old when he died in 1931 or 1932, which would indicate the site pre-dated railroad construction. He stated the Mystic Maze was a site prior to the time of his birth. He did not know who scraped the gravels into alignments over the area but indicated that the Mohave used to put some of their men in the center of the area of alignments and then left them to find their way out of the maze without crossing the gravel alignments. By doing this they would leave the devil behind them. This informant became very angry when Mrs. Brown remarked that some thought the maze was the result of railroad labor raking the desert gravels into long rows to simplify gathering

for use as aggregate in the construction of the railroad bridge piers."

Since the "mystic maze" in reality merely consists of groups of parallel lines which would offer no difficulty whatever to men wanting to "find their way out," there may be a discrepancy in the informant's information; or perhaps this is an indication that the Mohave were not very familiar with the structure of the "maze."

Similarly, Arthur Woodward (1932, p. 378) reports, "the Mohave deny having built it, nor do they know the builders."

He goes on to note:

"At one time, as late as 1888-92, it was learned that there were two gigantic human figures incorporated with this maze. However, railroad contractors, building a new line through the desert, found it necessary to lay out the right of way through a portion of the aboriginal creation, and the human figures were destroyed."

Rogers (1939, p. 10) gives a similar account, except that he reports only a single human figure, rather than two, having been destroyed. Apparently no human representations are at the site at the present time, although it is not clear whether Setzler (1952, p. 390) is referring to an anthropomorphic pictograph or to the "maze" proper when he reports sighting a "giant" on a "T-shaped mesa" west of the Colorado River near Topock.

The belief that the "maze" is simply the result of scraping operations to get gravel for the railroad bed is dealt with by Rogers (1939, p. 10), who refers to some Needles residents who stated that the maze was in existence prior to the railroad ballast operations. As I have not visited this site afoot, it is not possible for me to state whether the "maze" has been in existence long enough to permit the reformation of desert varnish on the surface of the rows of gravel.

Although no other gravel outline with any close resemblance to the "mystic maze" has yet been reported from the region,²² Mel Wharton (1932, p. 16) states:

"In Death Valley, ten miles north of Stove Pipe Wells, is another Indian maze. It is similarly built. The valley maze, built at the point of highest summer heat in this furnace-like sump, consists of rectangles of various sizes. Looking down upon them one could almost believe he were gazing upon the gigantic floor plans of a house."

In conclusion, it should be noted again that the classification of the Topock "mystic maze" as a pictograph is only a tentative one.

Although the "maze" does not seem to be suited to any efforts at surface water control or irrigation, there is a possibility that it is a manifestation of some cultural trait other than pictography.

Other Gravel Pictograph Sites

Although the anthropomorphic gravel pictographs of the region have attracted most of the attention, the majority of the gravel constructions reported apparently are of a non-anthropomorphic nature. No evidence of human representations is reported at twelve of the fourteen gravel pictograph sites listed by Rogers (1939, pp. 9-16). His two exceptions are the "giant desert figures" site and the "mystic maze." Available information makes it possible to add six more non-anthropomorphic sites to his list. (See Map 1 and explanation.)

This apparent paucity of sites is probably due to a lack of field research at least as much as it is due to any real scarcity of sites. This is an unfortunate situation, for the limited information on such sites greatly restricts attempts to draw general conclusions. One conclusion, however, which is made by Rogers (1939, p. 13) is that the pictographs of the "circular or elliptical type" are "the most common in the river region."

Examples of this type of pictograph, for instance, occur at the "giant desert figures" site in Group B; and are reported at the "Mat-ho-ko-sabbi" site by Bourke (1889, p. 173); and at Site No. 2 and Site No. 3 Ripley by Setzler (1952, p. 401). All three of the foregoing writers express the view that these circles have been beaten or tramped out on the gravel surface. This writer tends to agree, because, as has been previously pointed out, the one such circle that he has observed seemed identical in appearance to the ordinary aboriginal trails of this area.

Groups of gravel or rock cairns are present at six of Rogers' sites, all six of which are in the desert areas to the west of the valley of the lower Colorado River. ²³ Bourke's "Mat-ho-ko-sabbi" site has the only group of cairns yet reported from the river valley; unless one wants to consider the public gravel piles at the "giant desert figures" site to be cairns.

With the exception of the quadrupeds associated with the human representations at the "giant desert figures" site, no other definitely animal forms made from gravel have been reported from the region.

Neighboring petroglyphs, if well preserved, may be of assistance in identifying what objects some of the gravel constructions represent. For example, gravel pictograph site Riv-39, a sinuous form some 100 feet in length, is near petroglyph site Riv-47 which has stylistically similar serpentine forms. The details of these petroglyphs are so well preserved that one can readily identify them as being representations of the snake form. Thus there is a possibility that the subject matter of the less distinct but somewhat similar gravel form at Riv-39 may be the same.

Although this writer has visited only a few of the petroglyph sites in the region, he has found great variety in elements. Beyond noting that petroglyphs both of a pecked and red painted nature were observed, too little is known to make a comparison with the gravel pictographs as to subject matter and style. This certainly is a field which requires investigation. ²⁴

Descriptions of "Sand Painting"

Although gravel pictography has not been reported per se historically among the tribes inhabiting or peripheral to the gravel pictograph area, a number of these tribes practiced various other forms of ground pictography, commonly described as "ground painting," or more commonly, "sand painting." In addition, the technique and design elements in some cases bear resemblances to the gravel pictographs. Therefore, it may be profitable to examine the available evidence.

Colorado River Tribes. Although these tribes have often been considered to lack the trait of sand painting, the most southerly of them, the Cocopa, are reported to have it (Gifford, 1933, pp. 310-11). The account also indicates that the next most southerly tribe, the Yuma, ²⁵ practiced sand painting to a very limited extent. In addition, it is interesting to note that not only is the Cocopa technique of construction similar to that which must have been employed in making some of the gravel pictographs; but also that the finished sand painting was not obliterated. Gifford's Cocopa account is as follows:

"No sand painting in treating arrow wounds. (Yuma interpreter said this device rarely used by Yuma.)

"Men suffering club wounds treated by male shamans. If face fractured, wound breathed upon, blood sucked. Songs referred to deities other than Coyote (or Fox). Shamans walked in 4 cardinal directions, made rudimentary sand painting (matsakorokor) near house in which wounded man lay. Made only once during treatment. Made marks on ground with foot, drew ring with piece of wood, heaped 4 tiny piles of earth with hands, in the 4 cardinal directions, within circle (mataukas). Whole about 1' diameter. No differentiating colors. Ring represented edge of world, 4 piles sacred mountains. These helped shaman bring all dreams to aid in curing. Picture not obliterated but left."

For the other tribes of the river, up to the Grand Canyon, the Chemehuevi, Mohave, Piute, Walapai, and Havasupai, there does not seem to be ethnographic evidence that sand painting was practiced in historic times.

Tribes West of the Colorado River. Various forms of sand painting are reported for the historic Fernandeño, Cupeño, Juaneño, Cahuilla, Luiseno, and Diegueño of southern California; and for the Akwa'ala of Baja California.

"Among the Fernandeño a four-sided and roped-off ground painting was made, in the middle of which a man stood, holding twelve radiating strings, the ends of which were in the hands of as many assistants. When he shook the cords, the earth quaked, and whatever person he had in mind became sick (Kroeber, 1925, p. 626)."

The Cupeño are reported by Strong (1929, p. 256) to have used a multi-colored sand painting in the girls' adolescence ceremony:

"The painting was in the shape of a circle, usually about twelve feet in diameter. In the center were three holes, the center one representing the heart of the universe. On each side of these were the figures of Mukat and Tumaiyowit; each had a 'walking stick,' . . . and a pipe Around them were figures representing their people."

The boys' initiation sand painting was "identical in all details (Strong, 1929, p. 259)."

The Juaneño are described as having an initiation ceremony for certain young men which involved a "sand painting -- of an animal, it is said -- by which the novices fasted and refrained from drink for a period of about three days (Kroeber, 1925, pp. 640-41." In another ceremony, an image, possibly of the god Chingichnich "constituted an altar, in front of which was made a rude drawing or sand painting (Kroeber, 1925, p. 639)."

The Mountain Cahuilla, Strong (1929, p. 175) reports, made a sand painting during the boys' initiation ceremonies:

"The net, in the case last cited, made a shallow pit four or five feet in diameter. In this was placed a 'web' of red, . . . black, . . . and white colors. . . . They were arranged like the spokes of a wheel within the pit."

The Mountain Cahuilla are also listed as having the following elements in their sand paintings connected with the toloache initiation: sand painting altar; colors; sun, moon, stars, Milky Way, the world, four sacred mountains, animals and birds depicted (Drucker, 1937, pp. 35-6). Also use of sand painting in the girls' puberty rite is noted by Drucker (1937, p. 33).

The Pass Cahuilla are reported as having a sand painting with representations of celestial bodies in the girls' puberty rite (Drucker, 1937, p. 33).

The Luisenõ and Diegueño both made anthropomorphic ground pictographs of string. Among the Luisenõ (DuBois, 1908, p. 85 and fig. 1), these figures, called "Wanal Wanuwut," were outlined with cord in the bottom of a trench some "five feet long, fifteen inches wide, and twenty-eight inches [in depth]." The four limbs were outstretched, a cross trench being made for the extended arms. Three stones were placed in a straight line along this figure.

The corresponding Diegueño figure (Waterman, 1910, pp. 304-5) of netting had a long tail in addition. Similarly lying in a trench, this representation also had stones placed on it; but whether there were three, as is the Luisenõ case, is not noted.

As among the Luisenõ, the Diegueño used the figure in the boys' puberty ceremony, requiring the initiates to jump from stone to stone. The stones were removed after the ceremony and the string representation "buried."

The ground paintings of both the Luisenõ and Diegueño featured large circles representing the world. Two such Luisenõ pictographs (DuBois, 1908, pp. 87-91) consisted of: concentric circles forming the exterior; pictographic elements referring to various creatures, objects or concepts indicated within the circle. At least sometimes in the girls' puberty ceremony, the exterior painted circle was laid upon a circular ridge of sand. This sand was obtained from a hole dug in the center of the pictograph. The ground painting associated with the boys' puberty rite was divided into quarters. Kroeber (in DuBois, 1908, p. 177) also reports that a ground painting used in a boys' puberty ceremony was divided into quarters; it also had a central hole and was about twelve or fifteen feet across. Sparkman (1908, p. 221), too, notes a central hole as occurring in the boys' ceremony ground painting.

Diegueño ground painting (Waterman, 1910, p. 300-304) is reported as being of one general type. The border of this painting was formed by a single circle some fifteen or eighteen feet in diameter which encompassed representations of celestial bodies and constellations, geographical features, animals and ceremonial objects. A line, representing the Milky Way, extending along the diameter of the circle is reported as always present.

The Luisenõ ground painting circles involve references to the Milky Way, geographical features, plant, animal and anthropomorphic characters, and ceremonial objects. Among the Luisenõ the Chungichnish cult animals were included in the painting (DuBois, 1908, p. 89) while among the Diegueño the corresponding "awik cult" animals were represented (Waterman, 1910, p. 303). Symbols for the Milky Way are prominent elements in the ground paintings of both the Luisenõ and Diegueño as well as being the representational meaning of the Luisenõ "Wanal Wanuwut" string figure. DuBois (1908, p. 88) further notes, "Wanamul seems to include the stem which is found in wanawut, as if spirit and Milky Way were synonymous." Both the Luisenõ and Diegueño confined all the pictographic elements of their observed ground paintings within a circle; with the exception of distant geographical features, i.e., islands and mountains (Kroeber in

DuBois, 1908, fig. 5; Waterman, 1910, pp. 350, 352 and plates 24, 25).

The Luiseno ground paintings (DuBois, 1908, p. 87) are described as having been used in: "Mani, the toloache ritual; Wukunish, the girls' ceremony; the ant ordeal; and in Unish Matakish, the ceremony for burying the feathers of a toloache initiate when he died." On the other hand, the Diegueno ground paintings (Waterman, 1910, p. 293) have only been noted in association with the boys' puberty ceremony.

The Akwa'ala of Baja California are reported upon by Drucker (1941, p. 217):

"A very crude sand painting, simply four little mounds of earth heaped up in each of the cardinal points constituted the sand painting (Gifford describes a very similar one made by the Cocopa . . .). According to the informant the four dirt piles did not represent mountains or anything else; 'it was just a custom'."

This was used for curing purposes (Drucker, 1941, p. 161).

Tribes East of the Colorado River. Sand paintings have been noted in reports on the Yavapai, Papago, a number of the Apache groups, the Navaho, the Hopi, the Zuni and other more easterly Pueblos. The Yavapai and the Papago, being located historically closest to the lower Colorado River, will be considered first.

The Yavapai are described by Corbusier (1886b, pp. 333-34) as making a sand painting "for the purpose of averting" disease:

"In the middle of one of the villages they erected a ramada, or brush hut, some ten feet in diameter, and under it, on the sand, illustrated the spirit land in a picture about seven feet across, made in colors by sprinkling powdered leaves, grass, red clay, charcoal, and ashes on the smooth sand. In the center was a round red spot, about ten inches in diameter, and around it several successive rings, alternately green and red, each one being an inch and a half wide. From the outer one radiated four somewhat triangular shaped figures, each corresponding to one of the cardinal points, giving the whole the appearance of a Maltese cross. Around this cross and between its arms were the figures of men their feet toward the center, some made of charcoal with ashes for eyes and hair, other of red clay and ashes, etc. These figures were eight or nine inches long, and nearly all of them lacked some portion of the body, as an arm, or leg, or head."

A sand painting of the Northeastern Yavapai is described by Gifford (1933, p. 310):

"Shamans made sand painting . . . of white earth, about 20' square, for novice shamans. (figure) White disks in 4 quarters represented 4 mornings or 4 worlds. On each disk stood one man who was to become a shaman. This was done for short time on one morning. The 4 candidates sang, naming sky, clouds, sun, moon, wind,

etc., 'things to clear heaven'."

Gifford also notes that "sand painting made by shamans to ward off epidemic of measles or smallpox."

The Papago reportedly use a sand drawing in curing "wind sickness" (Drucker, 1941, p. 217):

"Four circles were drawn on the ground, one at each cardinal point, and in them sticks were placed to represent trees, and small images of animals as well. The sticks and images were painted (just how was not known; the informant had heard of but not seen the rite). After the songs all the things were knocked down, and the patient brushed with creosote branches."

The Kikimai Papago are likewise reported by Gifford (1940, p. 76) to use a sand painting in curing.

The Chiricahua Apache made a "sun circle" sand painting "for the purpose of curing . . . those who have become sick from the sun" (Gatschet, 1885, pp. 144-46):

"The circle is properly speaking two concentric rings, and is composed of colored substances of various shades. The diameter of the ring is ten or more feet.

"The inner ring of the circle is called *bās* or *nibās* (round). The rim of the circles does not follow the line of a true circle but shows sallies and angles. The angles or corners in the circle represent rays of the sun and the whole circle is an image of the sun. The effigies of four men, each painted with a different clay color are placed on the inside of the circle; they . . . represent genii that can only be seen by the conjurers in their dreams. They stand on one leg only, the other leg being wrapped around the one on which they stand. On their heads they carry an ornament resembling two horns, which are in fact, as the name has it, two hats."

Another Apache sand painting used as "a last resort" in curing is described by Reagan (1904, pp. 247-48):

"It is drawn on a leveled, sanded spot of ground some sixteen feet in diameter. [The colors are green, red, yellow, and black.] The rings separating the concentric squares are rainbow circles. The central figure is the sun, and the squares associated with the sun are the medicine blocks. The first and second concentric spaces from the central area represent land; the space in which the frogs are swimming, water; and the outer concentric space, the abode of the gods."

(The outer space and the two inner spaces include anthropomorphic and quadruped figures.)

Gifford (1940, p. 76) reports a circular sand painting for the Northern Tonto Apache; also a circular one with an opening toward sunrise, a cross in center, and persons (gods) represented for the San Carlos Apache; a circular sand painting for curing among the Cibecue Apache; and a circular sand painting with opening toward the sunrise for the White Mountain Apache. He lists these Apache groups as without sand painting: Warm Springs; Huachuca Mountains; Mescalero; Lipan; Llanero; and Ollero. The Jicarilla are reported to have the trait (Douglas, 1932).

The Navaho sand paintings are of such a complex nature that it would be difficult to attempt much of a description of them here. Douglas (1932, p. 3) describes them in these general terms:

"The pictures are square, rectangular and round." (Ranging from 3 to at least 32 feet in size.)

"The pictures represent in conventionalized form, the figures of male and female gods, divine ceremonies, lightning, stars, sunbeams, rainbows, mountains, animals, plants and other objects having a mythical or traditional significance. The bodies of the deities are extremely long and slim with round or square masked heads and very abbreviated arms and legs."

The extensive literature on Navaho sand paintings can supply the reader with descriptions of a more detailed nature; the reader is especially referred to Kluckhohn and Spencer (1940) and to Wyman (1952) for detailed sources.

The characteristics of Hopi sand paintings are likewise summarized by Douglas (1932, p. 4):

"The pictures are on the floor directly in front of the altars. They are rather small, squares, rectangles and sometimes circles from 2 to 4 feet in the greatest dimension being usual. The subjects of the pictures are clouds, rain, rainbows, lightning, snakes, various animals and representations of the masked figures called kachinas. Unlike the Navaho, the Hopi do not have to destroy the pictures the day they are made."

Zuni sand paintings are described as being similar and Douglas (1932, p. 5) notes the reported occurrence of the trait at other Pueblos, including Sia, Jemez, Laguna, Isleta and Acoma. He furnishes a bibliography on sand painting among these Puebloan groups.

Conclusions

Although only a limited number of gravel constructions are known which are definitely pictographic in nature, and although the various examples of sand painting given here are limited, enough information is

available to permit some conclusions.

Sand paintings (a term which includes a variety of ground pictographs) are reported among a number of tribes historically situated to the east, south, and west of the gravel pictographs area.

The total reported range of methods used by these tribes to construct sand paintings includes techniques of scraping and piling which would be suited to constructing gravel pictographs (such techniques reported for the Cocopa of the Colorado river delta, the Papago to their east, and the Akwa'ala to their west).

At least one tribe (the Cocopa), like the makers of the gravel pictographs, did not obliterate the completed sand painting.

The total reported range of figures depicted in sand paintings includes "Maltese cross," anthropomorphic, quadruped, and serpentine figures; these being the most easily identifiable forms of the gravel pictographs. Of these there is only one form of gravel pictograph which is definitely similar stylistically to a historic tribe's sand painting. This is the Yavapai "Maltese cross" sand painting which resembles the "Maltese cross" reported and photographed by Setzler at his gravel pictograph Site No. 1 Ripley. The proximity of this site to historic Yavapai territory is of additional interest.

Although no tribe is reported ethnographically to have practiced "gravel pictography," or to have made sand paintings as large or in exactly the same style, the preceding survey indicates that gravel pictographs are not a phenomenon wholly distinct and separate from the ethnographically reported sand paintings. In addition, the tribes whose sand paintings seem to be most similar in construction technique to the gravel pictographs are at the southern end of the gravel pictograph area. At the northern half of the area, sand painting does not appear to have been practiced historically. The problem of whether this is an indication of culture change, migration southward, or a combination of these and other factors is a subject which deserves investigation.

These and other theories, however, seem to be of little use at the present time. There simply is not enough accurate and detailed information on gravel pictograph sites. Certainly much more must be learned about the pictographs themselves before any defensible conclusions can be reached as to their cultural significance.

Similarly, the determination of cultural relationships of the gravel pictographs also awaits a fuller understanding of other aspects of the archaeology of the region. For instance, additional research may reveal that the known range of gravel pictograph sites (with the possible exception of the most northerly ones) occurs within the range of pottery-bearing archaeological Yuman sites; with local variations, this archaeological pattern occurs from the territory of the historic Luiseno and Diegueno in the west to the Gila Bend country in the east. On the other hand, the correlation possibly could turn out to be with the early Anasazi intrusions into the Mohave Sink area reported by Rogers (1929, pp. 12-13), or with

the Pueblid Prescott culture which was exerting influence on the lower Colorado River perhaps as late as 1200 A.D. (writer's field notes). In any case, the fact that the sand painting Southwestern peoples are separated from the sand painting southern and lower California peoples by an area containing numerous gravel pictographs does not seem to point towards coincidence.

NOTES

1. UCAS site Riv-46.
2. Designated by Rogers as site SDM-C-63.
3. Extending from the Mexican border to Parker Dam, under the auspices of the University of California Archaeological Survey, which furnished field equipment in addition to funds for the research. Appreciation is extended to Malcolm J. Rogers for suggestions prior to the fieldwork, and to Carr Tuthill of the San Diego Museum of Man for making available Rogers' site records.
4. Appreciation is expressed to Walter D. Scott of Blythe for his generosity in flying me over the site in his plane on August 23, 1951.
5. Kindly furnished by Professor R.F. Heizer, Department of Anthropology, University of California, who also originally suggested this re-examination of the pictographs. The 23rd Photo Section, Air Corps, U.S. Army, made the photographs of this site April 12, 1932.
6. Tracks of at least one wheeled vehicle, and probably more, appear in the 1932 photographs. Since the photographs were reportedly taken before Woodward and party visited the site by automobile, it may mean that the site was known locally previous to the publicized discovery in 1932. Similarly, Houmann, 1936, p. 7, states:

"Another interesting testimonial is that of James Walters, that he has been a resident of Palo Verde Valley for about forty years, and is familiar with the Indian 'rock pictures' eighteen miles north of Blythe and one mile west of the Colorado River, and that these looked the same to him forty years ago as they do today."
7. "'Desert Varnish' is the term commonly applied to the dark brown and black coatings of iron and manganese oxides frequently occurring on the rocks of the desert regions of the southwestern United States. The substance so called is either identical with or closely related to similar deposits from other parts of the world where periods of excessive dryness alternate with intervals of rainfall." Laudermilk, 1931, p. 51.
8. There are numerous vestiges of other pictographs at the site, but they are faint impressions in the surface gravels, rather than being spaces cleared of gravels. As a result, they are too indistinct to be described accurately, with the one exception that Rogers (1939, plate 22) depicts as figure 3. This figure, which may possibly represent a snake, is now crossed by a dirt road which has rather badly defaced it. Consequently, only its rough outline and location are indicated on the overall sketch of the site.
9. Laudermilk, 1931.

10. "Yuman" is meant here purely as an archaeological term as used by Rogers (1945) to designate the prehistoric ceramic culture of the region.
11. Jar is in the collection of C.S. Walker, Goldrock Ranch, Ogilby, California. The sherds are from UCAS site Imp-37 and are deposited at the Museum of Anthropology, University of California, Berkeley.
- 11a. In 1542 Juan Rodriguez Cabrillo, in command of the first Spanish sea exploration of the California coast visited among the Chumash of the Santa Barbara Channel. The Chumash told Cabrillo's party that in the interior were other Spaniards mounted on horses and using cross-bows and swords, reference apparently being to Coronado's expeditionary force (Wagner, 1928, p. 46, note 70). The point here is that if the quadruped figure in question is a horse, it may date at the earliest to about the middle of the sixteenth century. (Editor's note).
12. Rogers' revised terminology for Malpais (Haury, 1950, pp. 192-3).
13. Woodward (1932, p. 378), referring to this site, says: "Efforts were made to learn whether or not such figures were incorporated in the legends of the Mohave or Chemehuevi Indians, who inhabited this country, but apparently such was not the case."
14. Personal conversation with A.W. Dunagan, Manager, Heron Field, Blythe, California.
15. Possibly identifiable with "Hôkusave, a settlement by the river," (Kroeber, 1951, p. 140 and Map 1.).
16. Kroeber (1951, p. 108) lists Mohave "true myths, dealing with beginnings of the world and institutions; as Origins . . . , Mastamho . . ." as belonging to the class of "dreamed, and therefore supernaturally validated" tales. He also comments (Ibid., p. 136) on some other accounts of Mohave myths (with Merryman the informant) by Bourke as being "somewhat confused but basically sound."
17. Name applied by local Pima.
18. Russell (1908, p. 24) uses Hohokam in this sense: "The term Hohokam, 'That which has Perished,' is used by the Pimas to designate the race that occupied the pueblos that are now rounded heaps of ruins in the Salt and Gila river valleys."
19. UCAS site SBr-219.
20. Photograph made by 23rd Photo Section, Air Corps, U.S. Army, March 28, 1932. On file in UCAS office.
21. Personal conversation, October 22, 1952.

22. Rogers (1939, p. 11) reports the presence of "some gravel windrows similar to those employed in the mystic maze" at site SDM-M-56 near King, California.
23. Rock cairns, considered to be trailside shrines, occur frequently in this region, especially when such trails traverse mountain passes. However, since Rogers was perhaps the first to distinguish such shrines in this area, it seems unlikely that the groups of cairns at these six sites were confused with trailside shrines. Definite trailside shrines do not come within the scope of this paper.
24. Rogers' site records at the San Diego Museum of Man have information on the location of a number of such sites.
25. In a discussion at a meeting of the Anthropological Society of Washington (Mallery, 1885, pp. 143-4) a description by Corbusier of a sand painting ceremony is ascribed to the Yuma. However, as this description is almost the same, word for word, for that published by Corbusier (1886, pp. 333-4) in his report on the "Apache-Yumas and Apache-Mojaves," it is quite clear that the Yavapai, not the Yuma, are the group to which he refers.

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EXPLANATION OF ILLUSTRATIONS

MAP 1

- A. Group of rock cairns. Twp. 12 S., Range 3⁴ E., SW 1/4 of NW 1/4 of Sec. 7, on south bank of Sawmill Creek. Site Iny-127. (UCAS site records, recorded by R. Farrell and D. Dyer.)
- B. Rectangles of various sizes. In Death Valley, 10 miles north of Stove Pipe Wells. (Wharton, 1932, p. 16).
- C. Conical piles arranged in 3 groups. Located 4 1/2 miles south of Shoshone in Inyo Co., on the west bank of the Amargosa River in Twp. 23 S., Range 7 E., Site SDM-M-118. (Rogers, 1939, p. 10.)
- D. Single line of cairns. On a series of low hills three miles west of Manix Station on the Los Angeles and Salt Lake R.R. in Twp. 10 N., Range 3 E. in San Bernardino Co. Site SDM-M-100. (Rogers, 1939, p. 12)
- E. Group of individual linear figures including 2 snakes, a few gravel windrows, and a number of circular and elliptical figures. On a rocky mesa 2 miles southwest of King, a station on the Los Angeles and Salt Lake R.R. in Twp. 11 N., Range 7 E., San Bernardino Co. Site SDM-M-56. (Rogers, 1939, p. 11.)
- F. Arrangement of 86 cairns in approximately parallel alignments. On a stony ridge which connects Crucero Mountain with the Mesquite Hills in Twp. 11 N., Range 8 E., San Bernardino Co. Site SDM-M-58. (Rogers, 1939, pp. 11-12.)

Also a single sinuous alignment of large boulders one mile east of SDM-M-58. Site SDM-M-58A. (Rogers, 1939, p. 12.)
- G. Parallel alignment of 64 piles of gravel along a mile-long "trail." Twp. 4 S., Range 7 E., Sec. 8, 18, 13, Riverside Co. Site Riv-51. (UCAS site records, recorded by Mr. and Mrs. F.J. Johnston.)
- H. A circle enclosing some sinuous paths and a small central clearing. Twp. 9 S., Range 9 E., Sec. 34, Imperial Co., just back of the Blake Sea terrace. Site SDM-C-117. (Rogers, 1939, p. 15.)
- I. Cairns with a certain amount of alignment present. Twp. 14 S., Range 9 E., Imperial Co. at the south end of Split Mountain on the east side of Fish Creek Wash. Site SDM-C-166. (Rogers, 1939, p. 13.)
- J. "Mystic Maze." (UCAS site SBr-219.) Description in this paper.

- K. An elliptical figure, a cleared path with the shape of a blunt-headed nail, and 3 short converging paths. Twp. 2 S., Range 23 E., Riverside Co., at the base of the Riverside Mountains on the 75 foot terrace of the Colorado River. Site SDM-C-64. (Rogers, 1939, p. 13.)
- L. "Giant Desert Figures." (UCAS site Riv-46.) Description in this paper.
- M. The circular or elliptical type, bisected by a central pathway, with a few enclosed figures. Twp. 5 S., Range 23 E., Riverside Co., at the base of the Maria Mountains on the 100 foot terrace of the Colorado River. Site SDM-C-57. (Rogers, 1939, p. 13-14.)
- N. Serpentine gravel-cleared form and other undescribed figures. At south end of Big Maria Mountains, approximately 7 miles north of Blythe. Site Riv-39. (UCAS site records, recorded by B.W. Cohoon.)
- O. Sites 1, 2, and 3 Ripley. (Setzler, 1952, p. 401.) Excerpts from his descriptions of Sites 1 and 2 are included in this paper. Site 3 "consisted of circles, partly eroded, at the brim of a high mesa."
- P. Rimmed circle enclosing "a glyphlike figure impossible to describe." Twp. 11 S., Range 22 E., Section 7, Imperial Co., on the 25-50 foot terrace of the Colorado River. Site SDM-C-41. (Rogers, 1939, p. 15.)
- Q. Human and quadruped figures, and "a sun with radiating lines." In the vicinity of Picacho, California. A.W. Dunagan, Manager, Heron Field, Blythe, California.
- R. Boulder alignment in a sinuous line. Twp. 14 S., Range 20 E., Imperial Co. on a stony mesa 3 miles north of the Cargo Muchacho Mountains. Site SDM-C-70. (Rogers, 1939, p. 13.)
- S. Piles of boulders occur throughout an unknown area, placed in no apparent order except in two instances: one alignment of 25; another of 34. Base of the Sierra de Juarez, Lower California, about Lat. $31^{\circ}35'$ N. and Long. $115^{\circ}35'$ W. Site SDM-LC-55. (Rogers, 1939, p. 12.)
- T. Two gravel-cleared circles approximately two meters in diameter with low mounds of gravel in their centers. Excavation of one failed to yield any other cultural evidence. East end of Bouse site, Bouse, Arizona. (Writer's field notes.)
- U. Ha-ak Va-ak site. (Russell, 1908, p. 254 and fig. 102.) His description included in this paper.

Sites not shown on Map 1: "Mat-ho-ko-sabbi." On the California side of the Colorado River close to the Nevada boundary. (Bourke, 1889, pp. 172-4.) Excerpts from his description included in this paper.

Iny-292. Cairns aligned in rows, forming three groups: one of 4, one of 14, and the third of 46. Excavation of one of the cairns by A.E. Treganza failed to yield any other cultural evidence. Twp. 19 S.,

Range 37 E., W. 1/2 of Sec. 18 (on Map 1 this site would be about 50 miles south of A, at the SW corner of Owens Lake). (UCAS site records, recorded by R. Farrell and A. Treganza.)

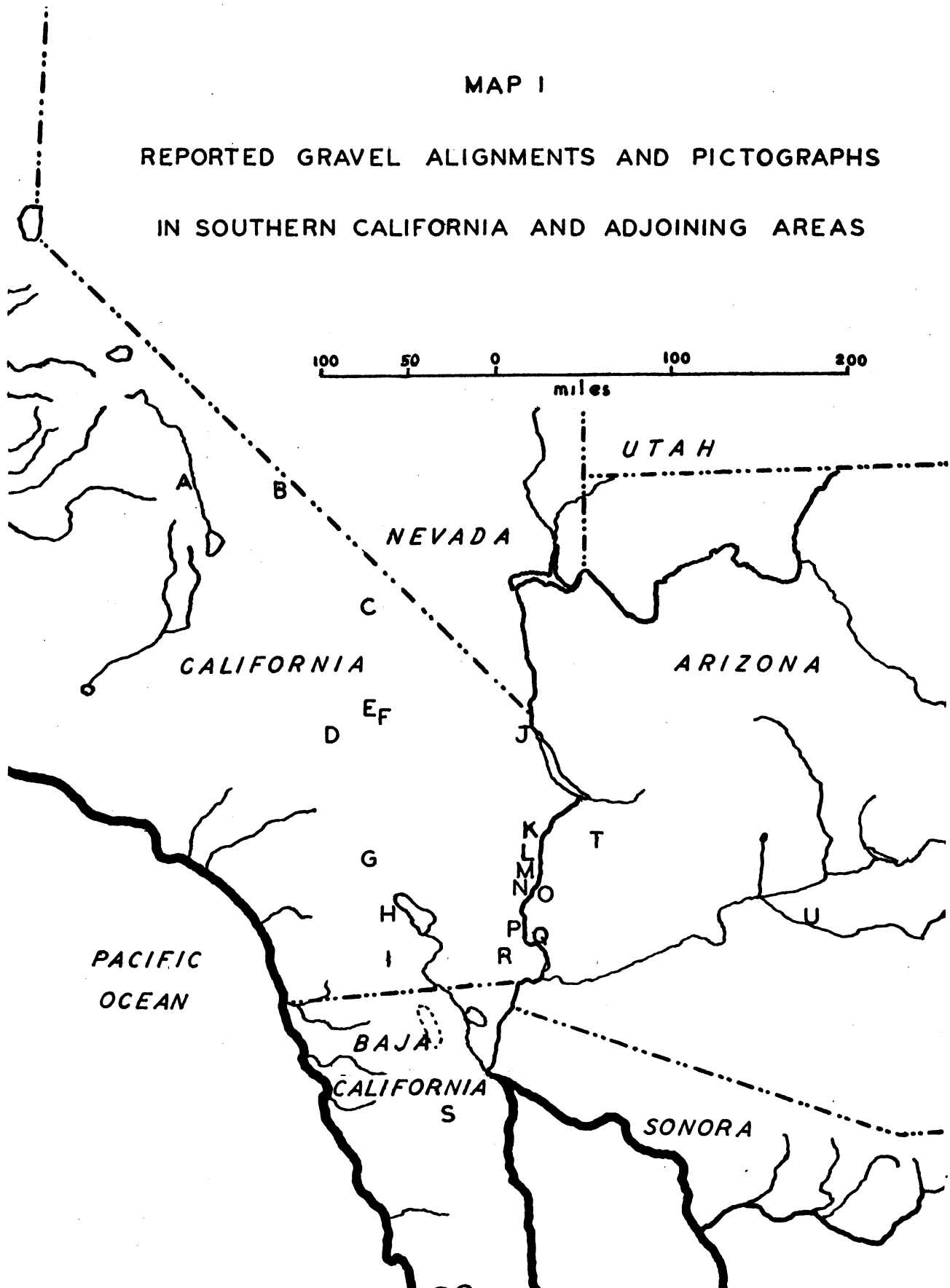
R:14:1. Circular rock outlines and a rock-formed design described as a feathered arrow without a point. Twp. 11 S., Range 22 E., Imperial Co. (Schroeder, n.d. p. 45, fig. 27.)

Figure 1

- a. Gravel pictograph group (Group A) at Riv-46 ("Giant Desert Figures" site). The head of the human figure is to the southeast.
- b. "Mystic Maze" (site SBr-219). Lines represent ridges of gravel reportedly averaging 5 to 8 inches in height and 5 feet apart. North is to left.
- c. Gravel pictograph group (Group B) at Riv-46 ("Giant Desert Figures" site). The head of the human figure is to the north.
- d. Gravel pictograph group (Group C) at Riv-46 ("Giant Desert Figures" site). The head of the human figure is to the southwest.

MAP I

REPORTED GRAVEL ALIGNMENTS AND PICTOGRAPHS
IN SOUTHERN CALIFORNIA AND ADJOINING AREAS



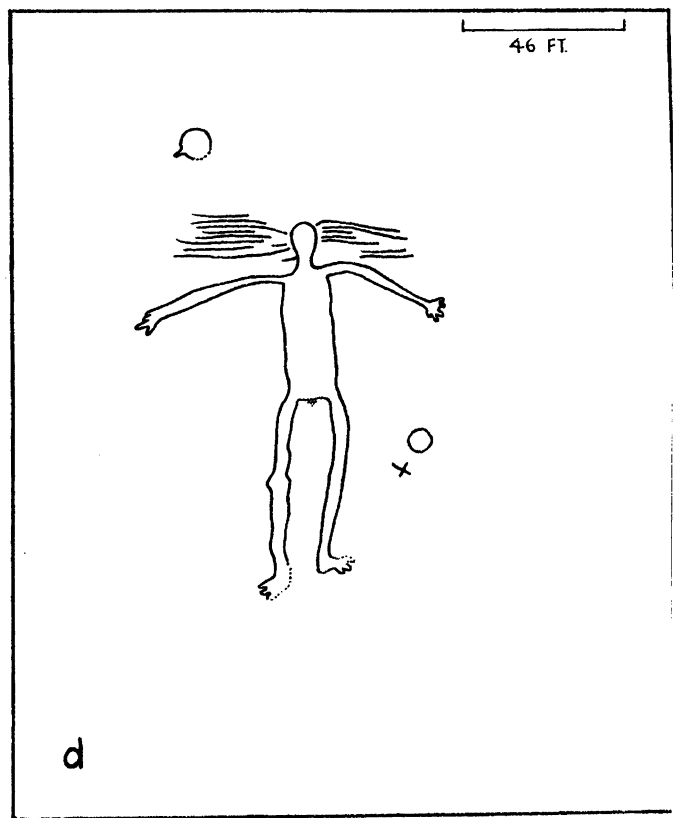
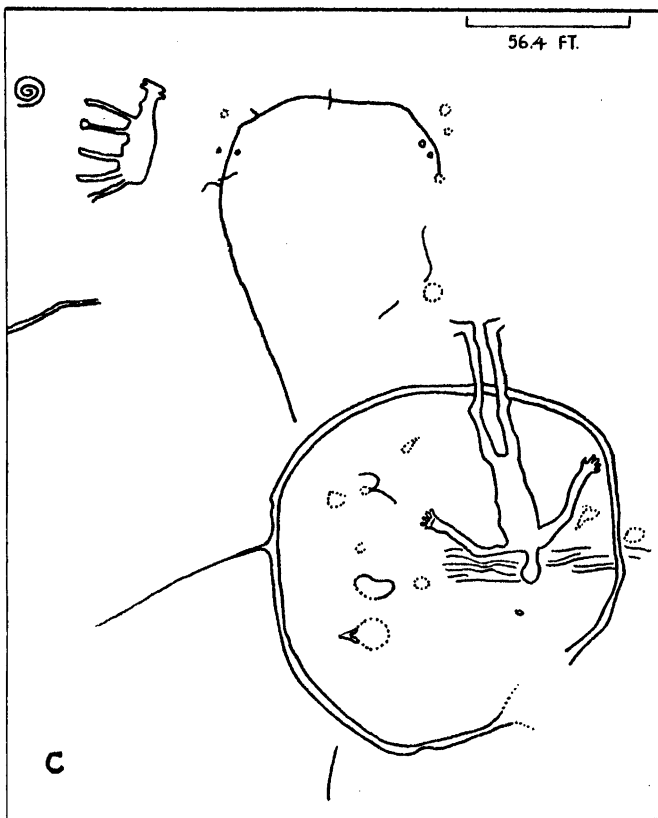
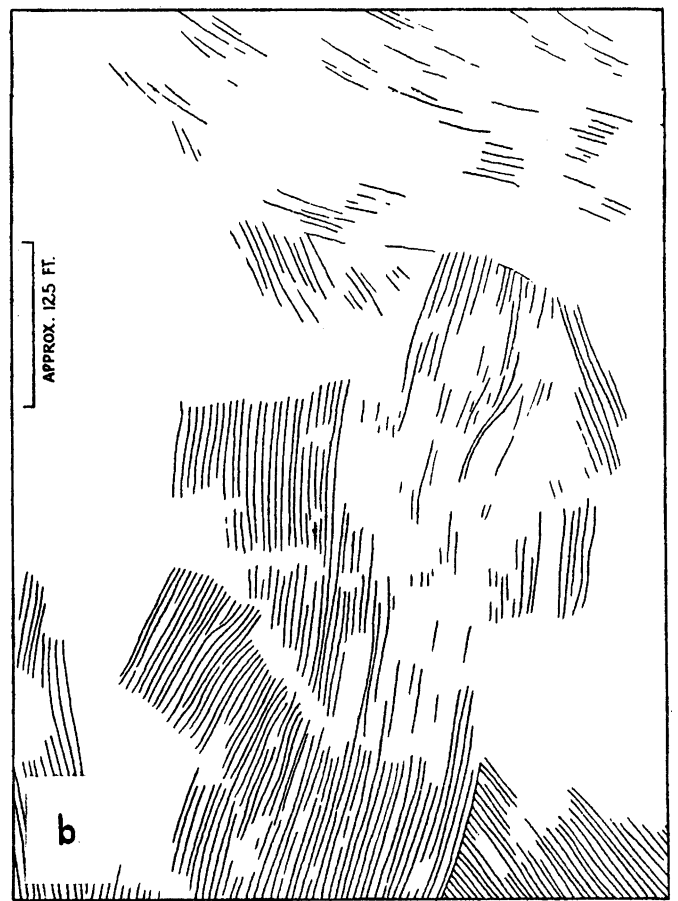
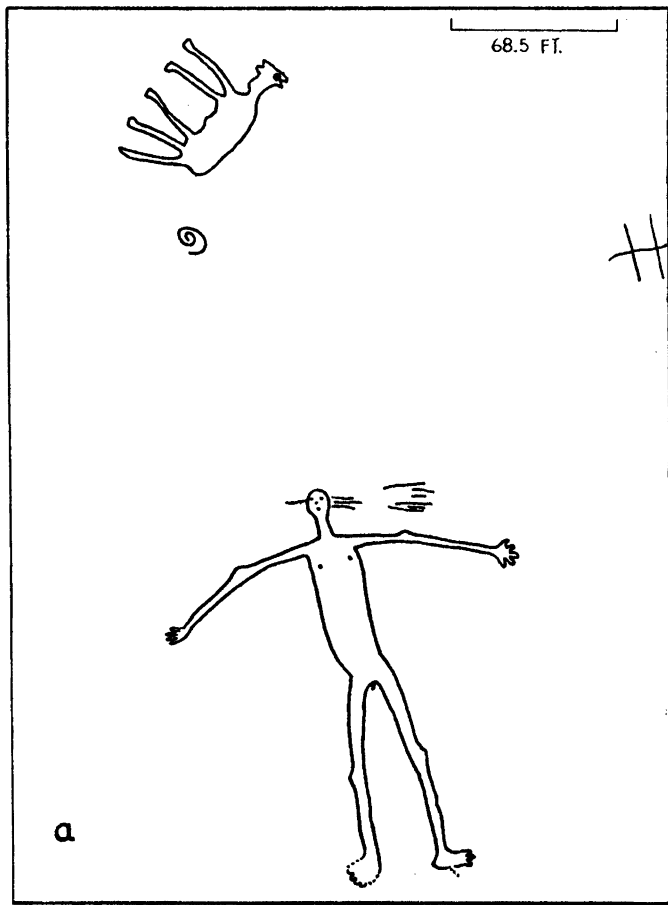


Figure 1.
Gravel Pictographs and Alignment Groups
from Lower Colorado River Region.

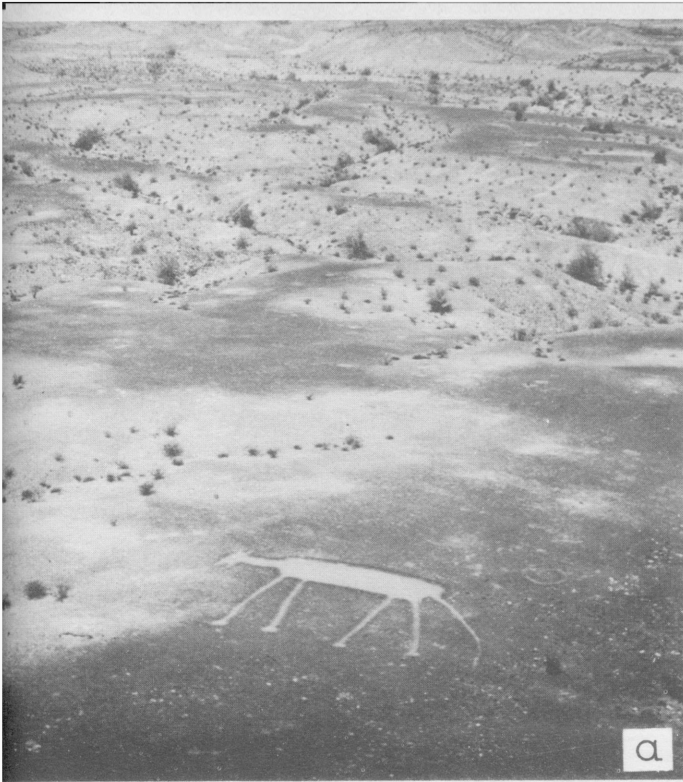


Plate I.

Gravel Pictographs from

Site Riv-46

a. Quadruped of Group A.

b,c. Human figure of Group C.

Scale in $\frac{1}{2}$ divided in inches.

APPENDIX

ADDITIONAL SURFACE INTAGLIO AND BOULDER OUTLINE IN THE NEW AND OLD WORLDS

Robert F. Heizer

The occurrence of boulder outline and "intaglio" designs elsewhere, and ascribable in origin to aboriginal peoples, is cited here. These are of interest in often exhibiting the same technique as used in Southern California, but, except for occasional duplications of straight lines or spirals, the forms in each area are different, and no presumption is to be entertained as to a unitary origin and historical community of these surface designs in California, Peru and Australia.

T.H. Lewis (1889, 1891) describes and illustrates boulder outline figures of humans (male and female), a snake, a turtle, an unidentified quadruped, and circular enclosures from South Dakota, Iowa and Minnesota. Some of these approach the Southern California desert intaglios in size, but are differently made. For some of these the Dakota have explanatory myths, but Lewis was of the opinion that the stories are of later origin than the outline figures themselves.

Elsewhere in the New World boulder-freed areas, reminiscent in technique, but not in form, of the Southern California figures may be noted. Reiche (1949a) has published a detailed analysis and description of the intaglio designs ("delineated surfaces") near Nazca, Peru. These consist of straight lines or tracks of varying length and width, "ornamental pathways," birds, humans, spirals, mazes, and other elements. Many are so extensive and large scale that they must be seen from the air in order to comprehend adequately their form. Other accounts of these Peruvian desert figures are by Horkheimer (1947), Reiche (1949b), Kosok and Reiche (1949). These various authors incline to the view that many of the lines are oriented toward horizon points and were used to check the rising and setting of the moon, planets and stars. I am grateful to Dr. John H. Rowe, my colleague, for supplying these references. Additional South American instances are cited by Bird (1943, Fig. 3a, p. 189) and Ford and Willey (1949, p. 34).

In New Caledonia, boulder-covered areas have been developed into surface designs by removing and piling stones from the flat surface where the soil is of contrasting color to the rocks. Some of these, ranging from .8 to 4.5 meters in length, are described by Avias (1949).

The late Dr. D.S. Davidson, University of Washington, was kind enough to supply me with information on such desert figures in Australia, pointing out that they are thus far reported from South Australia, western and northern New South Wales, and northern Queensland. The patterns consist

of circles, loops, arcs, meandering lines, irregular figures of curved lines, sometimes spread over a very wide area. Publications concerning these are by Campbell and Mountford (1939), Mountford (1927, 1939), Dow (1938a, 1938b) and McConnell (1932).

The above review is nothing more than a mention of evidences of a cultural pursuit which seems to be of sporadic and widespread occurrence. When attempting explanations of local occurrences, such as that in Southern California, the mere knowledge that we are not dealing with a unique phenomenon in human history is of value, and to this extent these notes seem justified.

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