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October, 1955

CERRO MANGOTE: A PRECERAMIC SITE IN PANAMA *

Charles R. McGimsey III

UNTIL about 25 years ago nearly all that was known of the prehistory of Panama was the result of careful studies based on somewhat haphazard excavation (MacCurdy 1911; Holmes 1888). Almost without exception detailed and often gross provenience data were completely lacking. This unhappy situation was attacked in the late 1920's by Linné (1929). Beginning in the 1930's Lothrop succeeded in outlining and describing a number of culture areas covering most of Panama's Pacific watershed (Lothrop 1937, 1942, 1950). These areas of necessity reflected only the broad picture at the time of and immediately preceding the initial Spanish entradas for, although it was to be assumed that there was internal variation within each of these areas and considerable time depth for the country as a whole, no data on this were available. In the last few years work by the Smithsonian Institution and by Peabody Museum, Harvard University, has added to this picture. In general only the preliminary reports on this work have yet been published (Sterling, 1949, 1950, 1952; Willey and Stoddard 1954) but a small beginning has been made toward an understanding of the prehistoric developments within the region with the documentation of the Monagrillo culture located on the shore of Parita Bay in western Panama (Willey and McGimsey 1954). This culture predated by an unknown span of time the cultures with polychrome pottery typified by Sitio Conte. It had relatively simple plain pottery and depended in large part on the sea for food rather than on agriculture.

During the first half of 1955 the author undertook a program of survey and test excavations in southwestern Panama with a view to broadening this geographical and temporal picture. Some 50 sites were located during this survey and test excavations were made in approximately half of them. Cerro Mangote (Co-40) is one of these sites.

The Site

The Rio Santa Maria is one of the largest of the many rivers in Panama. It drains the central section of Veraguas Province and along its lower reaches forms the border between the Provinces of Coclé and Herrera before emptying into the gradually shelving, silt-filled Parita Bay some 150 km. southwest of Panama City. Ten km. above the mouth of the river on the north or Coclé bank lies Cerro Mangote, the first of a series of 3 hills. Cerro Mangote, the largest of the three, is nearly 1200 m. in length (east-west), 250 m. wide, and 45 m. high. The second hill, Cerro Girón, is separated from the first by only 300 m. while the third and smallest is immediately adjacent to the second. On the south slope of Cerro Girón and on the flat land between the hill and the river are located the shell and refuse middens of the Girón Site (Co-2), a large pre-Coclé, polychrome pottery site (Willey and Stoddard 1954).

Between these hills and the sea there is a flat expanse of grass covered *potrero* and vegetationless tideland or *alvina*. A heavy growth of mangrove borders the present coast and

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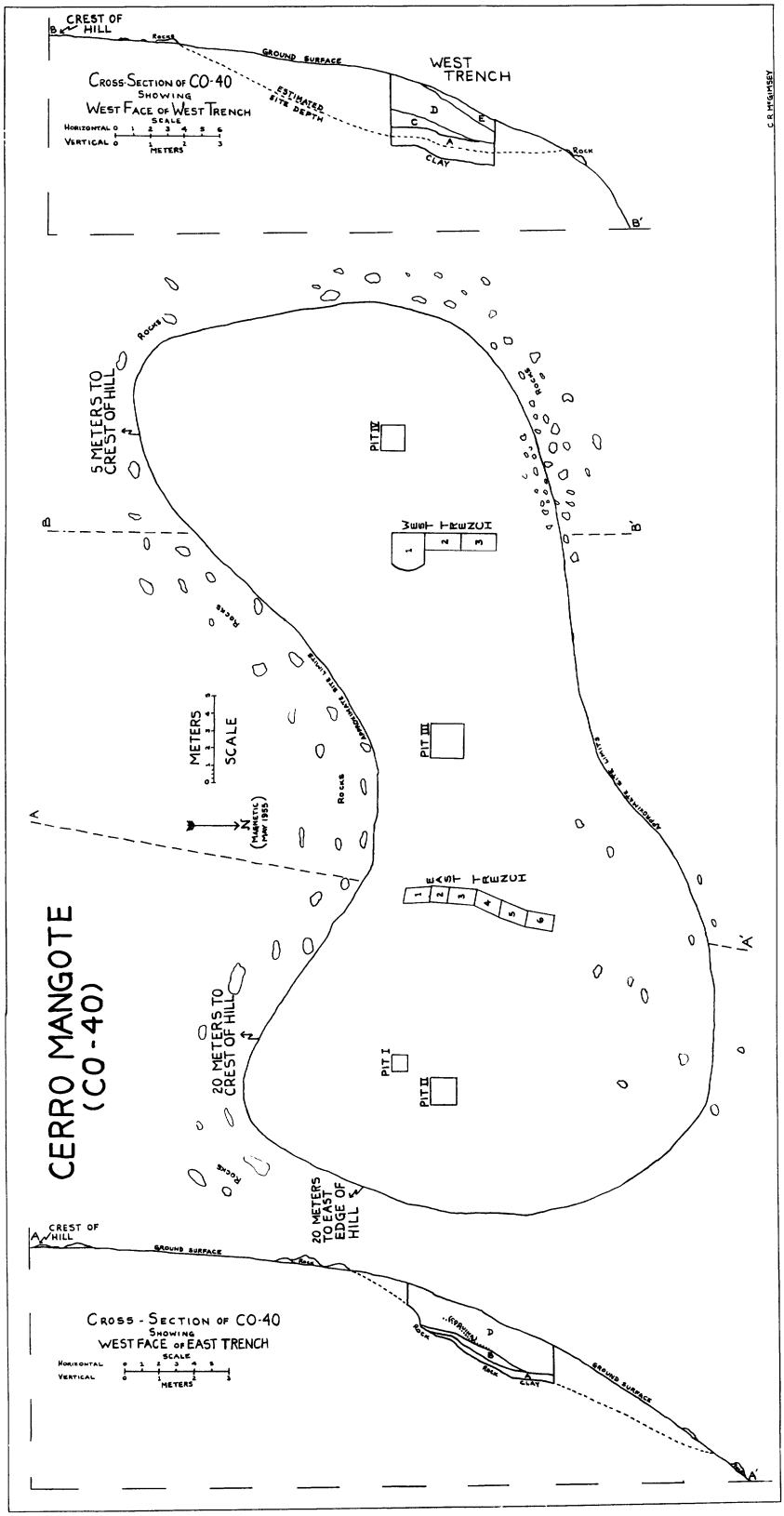

FIG. 1. Map of Cerro Mangote site, with cross sections showing excavations.

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occurs in small linear patches in the potrero. There is evidence that at one time the shore of Parita Bay closely approached these hills and that the shore has gradually retreated during the Recent through a process of offshore bar formation and lagoon silting (see Willey and McGimsey 1954: 29-30).

The site itself is a shell midden located on the east end of the north slope of Cerro Mangote just below the hill's crest. The presence and dimensions of the site can be traced only by the considerable number of shells on the surface of the ground and, in its deeper portions, by a hollow sound under foot (much the same effect as that given by a deep deposit of pine needles and humus). It is probably to this latter characteristic that we owe the discovery of the site, for the sound effects rather than the presence of shell were described by local informants when inquiry was made about sites in the area. Prior to our visit we were, in fact, dubious as to the existence of a prehistoric site for the description of "a large area where the ground sounds hollow" seemed to be in the same category as the persistent Panamanian story of the rich Indian graves to be found just below a floating blue light which is generally seen late at night.

The site is not impressive on first view for the entire hill is covered with a dense growth. Certainly other than its possible archaeological interest the site had little to recommend it as an area in which to work for this growth included a high proportion of nettles and thorn trees, the latter of the type infested by biting ants. In addition there appeared to be somewhat more than the usual quota of objectionable animal and insect life. Nevertheless the presence of large quantities of shell, the somewhat unusual location of the midden atop a sizeable hill, and the puzzling lack of sherds seemed to warrant a brief check. The one day set aside for making a few tests was rapidly extended and work was stopped after 6½ days only because our over-all program called for the investigation of 10 other perhaps equally important sites before the beginning of the rainy season brought all work to a halt.

The area covered by the midden is roughly the shape of an hourglass. It extends west along Cerro Mangote from a point 20 m. from the east end of the hill for a distance of approximately 55 m. The bulbous ends of the deposit begin 5 to 20 m. north of and 1 m. below the crest of the hill and extend down the slope for approximately 25 m. The surface of the ground drops as much as 5 m. over this distance. In its center the site narrows to little more than 13 m. in width. The depth of the deposit between the centers of the 2 bulbous ends appears to range between 1 and 1½ m. though in portions of the western end the deposit is nearly 2 m. deep. The midden thins out rapidly at the edges. In all, the site contains an estimated 1000 cu. m. of material, 30 cu. m. of which were excavated.

The Excavations

Two trenches and 4 pits were opened. The 2 trenches ran north-south through the 2 wide portions of the site. The pits were scattered, two on the east end of the site, one on the west end, and the fourth in the constricted central portion.

The West Trench was 6.00 m. long and 1.00 m. wide for the northern 4.00 m. The southern 2.00 m. were expanded to 2.00 by 2.25 m. in order to clear a skeleton. In the northern half of the trench there was a triangular stratum of almost pure oyster shell (*Ostrea chilensis* and *Ostrea mexicana*) extending from the surface at about the midpoint of the trench to a depth of 30 cm. at the north end. From the surface to 95 cm. in the south and from 30 to 60 cm. in depth in the north the excavation went through a deposit of loose gray-brown soil, shell fragments, whole shell, and a considerable number of head-sized boulders. Crab (*Menippe frontalis*) was the most numerous shell, but there were occasional lenses of oyster. Other shell present in small numbers included: *Protothaca grata, Anadara grandis, Periploma planiusoula, Iphilenia altior, Littorina varia, Thais kiosquiforma, Cerithedia valida,* and *Melampus trileneatus*. Below this level was a lens of nearly pure crab 50 cm. deep in the south half but tapering out in the northern third of the trench. Most of the other species were also present but in very small numbers. The lowest deposit consisted of about 25 cm. of shell and shell fragments. *Ostrea, Protothaca grata,* and *Scapharca tuberculosa* were almost equally numerous; *Menippe frontalis, Cerithedia valida, Cadium ringens, Alaba jeannette,* and *Anadara grandis* were present in small numbers. The soil of this level was reddish brown, moderately compact, and clayey. The stratum graded into hard red sterile clay at a depth varying from 1.80 m. in the south to 0.90 m. in the north.

The East Trench was 1.00 m. wide and 8.50 m. long. The first 80 to 100 cm. went through loose gray-brown soil with occasional boulders and a large component of whole and fragmented shell. The shell was primarily crab and oyster with the bivalves *Scapharca tuberculosa* and *Protothaca grata* forming the main minority species. Most of the species found in the second level of the West Trench were also present. Through part of the lower portion of this stratum and on occasion separating it from the stratum below was a thin layer of gray coquina

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consisting of solidified sand, shell, and gravel . Extending over the southern ¾ of the trench at an average depth of 1.00 m. was a level 10 to 30 cm. thick of loose light brown soil and shell. About half of the shells in this stratum were oyster while the remainder were crab and the small bivalves such as *Cerithedia valida* and *Littorina varia*. The lowest level consisted of compact reddish clay, shell, and shell fragments. Oyster predominated with *Protothaca grata* considerably less frequent. Crab and a few other species were present but numerically minor. This stratum gave way to sterile red clay and rock at a depth of 1.10 to 1.30 m.

Pit I, 1.00 m. square, and Pit II, 1.50 m. square, were located a few meters north and south of one another about halfway between the East Trench and the east end of the site. The first 40 to 50 cm. in both pits consisted of loose brown soil, shell, and shell fragments. *Ostrea chilensis* and *Ostrea mexicana* were the major species with *Menippe frontalis* second; *Protothaca grata, Scapharca tuberculosa, Thais kiosquiforma, Donax asper, Littorina varia,* and *Cerithedia valida* were present in small numbers. Below this to a depth of 70 cm. in Pit I and 110 cm. in Pit II there was reddish soil, still loose but gradually becoming more compact with increased depth. Oysters were by far the major species though not the only shell present. In both pits rock prevented further excavation.

Pit III, a 2.00 meter-square pit, was located midway between the 2 trenches in the constricted central portion of the site. The first 110 cm. were very loose, gray-brown sandy soil, shell fragments, some whole shell, and occasional boulders. The shell was principally crab with oyster much less frequent. Most of the species found in the trenches were present as well as a few *Galeodus patula* and *Murex regius*. In the next 50 cm. the soil was lighter in color and the shell was more fragmented. *Menippe frontalis, Ostrea,* and *Protothaca grata* were about evenly represented and most species found elsewhere in the site were present including an unusually large number of *Littorina varia* and *Natica unifasciata*. From 1.60 to 1.70 m. the soil was a reddish clay with oyster, some crab and *Protothaca grata,* and a few other species. Below 1.70 m. there was sterile red clay and rock.

Pit IV, 1.50 m. square, was located halfway between the West Trench and the western end of the site. The first 60 cm. were loose brown sandy soil with about equal proportions of crab, oyster, and *Protothaca grata*. The next 10 cm. were reddish clay with oyster and occasional crab, *Protothaca grata, Scapharca tuberculosa,* and a few other species. This stratum graded into sterile red clay.

In summary, the initial deposit (Stratum A) which covered the entire site was a thin one with oyster as the principal shell. The succeeding stratum (Stratum B), a deposit of oyster, crab, and small bivalves in nearly equal proportions, is found in all of the pits to a depth of approximately 50 cm. This second stratum is unusually thin (10 to 30 cm.) in the East Trench and does not cover the entire area of the trench. In the West Trench it is completely absent being replaced (though the exact time relationship is unknown) by an equally deep deposit (Stratum C) consisting almost exclusively of crab shells. In the central portion of the site covering at least the 2 trenches and the area between them but not extending to the lateral pits is a deposit (Stratum D) nearly 1 m. deep with crab as the principal constituent. Small bivalves and oysters are numerous, the latter occasionally occurring in small lenses. This stratum is the last major deposit but in the north end of the West Trench there is a final deposit (Stratum E) of almost solid oyster shell.

Nearly 1000 animal bones were recovered, of which approximately half were sufficiently complete to be identified in a general way but a lack of comparative skeletal material prevented precise identification. The following forms are represented: Panama White-Tailed Deer (*Odocoileus chiriquensis* Allen), a small mammal which is probably Chiriqui Collared Peccary (*Pecari angulatus* ?subsp.), Raccoon (*Procyon* ?sp.), and perhaps a few others, small toothed whale, sting ray, turtle, fish, and bird. The animal bone does not reflect the changes shown by the shells. Instead, the number of bones and the proportions of the various forms remain almost constant throughout the site. In general terms the deer constituted approximately 40% of the bone present, small mammals 25%, turtle 15%, bird 10%, fish 5%, and other forms 5%. Because of the size and perishable nature of fish bones the above figure probably does not adequately represent the importance of this element in the diet.

The Artifacts

The stone artifacts from Cerro Mangote are simple in nature and, although the projectile points, axes, and elaborate metates of the later cultures are absent, a variety of forms does occur. In addition to pebble grinders and choppers, there are pebble manos, basin metates, pounders, flakes, and other possible artifacts such as stone balls and discs.

Stone artifacts occur at Cerro Mangote with far greater frequency than has been recorded from any other site in Panama. A comparison between Cerro Mangote and the Monagrillo mound (He-5) (Willey and McGimsey 1954) shows that more utilized stone (236 whole and fragmentary pieces) came from the 30 cu. m. excavated at Cerro Mangote than from the approximately 700 cu. m. removed at Monagrillo (230 pieces). Even the pebble choppers and grinders, the most characteristic tool of the Monagrillo culture, occur with greater relative frequency at Cerro Mangote. If, for purposes of comparison, it is assumed that all of the pebble grinders and choppers found on the surface of He-5 were associated with the 2 upper levels (Strata 7 and 8) where the greatest pop-

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ulation concentration occurred there would be an average of one grinder or chopper for every 4 cu. m. of those levels excavated, whereas at Cerro Mangote an average of two were found in every 3 cu. m. removed.

None of the flaked stone exhibits secondary chipping and none of the other tools were intentionally modified except for the changes brought about through use. No ground stone tools were present.

The flakes and cores are largely of petrified wood though jasper and chalcedony also occur. The larger tools are all dark, dense, igneous rocks both fine and coarse grained. The fine grained specimens predominate. All of the materials used can be found abundantly in the vicinity of the site. The larger tools were made principally from waterworn cobbles not unlike those to be found along the shore and in the river beds today and small pebbles of chalcedony and related materials can be found there as well. Pieces of petrified wood, often of considerable size, are frequently seen on the surface of the ground and in the river beds.

As discussed in the description of the excavations it is possible to delineate strata at the site on the basis of the percentage variation of shellfish present as well as by soil changes. No correlation between these levels and any artifact categories could be detected in the present sample. In fact, no horizontal or vertical differentiation could be observed in the artifact inventory but it is quite possible that more extensive excavation would reveal the presence of some temporal variation in the artifacts utilized.

Pebble Grinders and Choppers. A total of 26 pebbles had been used for chopping and/or grinding. Of these, three had been used solely for chopping, four had been used for chopping and later for grinding, and the remainder exhibited grinding facets only. These pebble choppers and grinders from Cerro Mangote are identical in every respect with those associated with the Monagrillo culture.

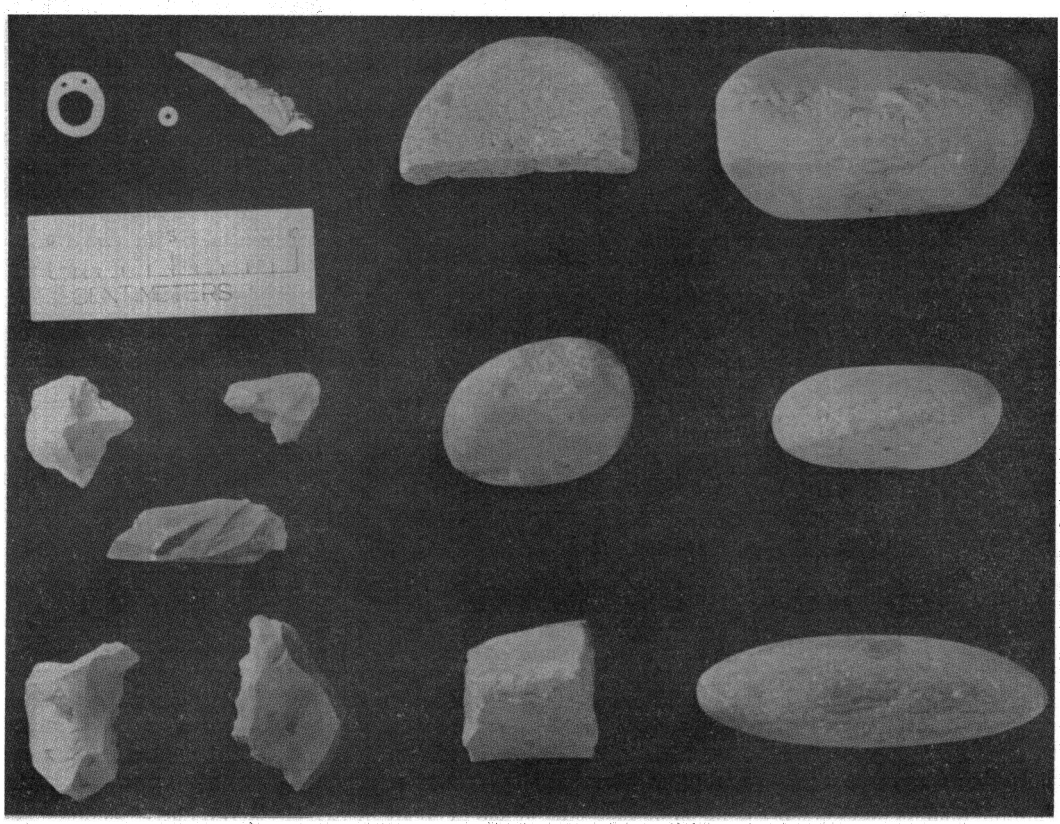

Fig. 2. Artifacts from Cerro Mangote. *Upper,* shell pendant, shell bead, bone awl, pebble mano, and triangular pebble grinder with 3 edges used; *middle,* 3 stone flakes, pebble pounder, and small oval pebble grinder with one edge used; *lower,* 2 stone flakes, fragment of triangular pebble chopper, and oval pebble chopper-grinder.

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The pebbles employed were roughly oval or triangular in cross section and in every case an edge running parallel to the long axis of the rock was utilized. While this is natural enough for a chopper, the deliberate choice of a narrow elongated ridge rather than a flat surface (which generally was available on the same stone) for grinding is less easily explained. Pebble manos (stones employing a large flat surface for grinding) were known and employed (see below). Probably the pebble grinders served some separate purpose, perhaps one related to the preparation of large quantites of shellfish for consumption. The fact that this tool type is associated with the Monagrillo and Mangote cultures, both of which depended heavily on shellfish, but not with the later agriculturally oriented groups lends some weight to this hypothesis.

Two of the 3 choppers are triangular in cross section while the third is ovoid. The 2 nearly complete specimens (one triangular and one ovoid) are subrectangular in outline. In each case only one edge had been utilized. This edge was battered and exhibits rough concoidal fractures where flakes were dislodged during use. The average dimensions are 15 by 8 by 5 cm.

Three of the 4 chopper-grinders are triangular in cross section and subrectangular in outline while the fourth is turtle-backed in cross section and oval in outline. On all four one edge had been used for chopping and later this same edge had been used for grinding so that the fractures resulting from the chopping action were partially obliterated. On the turtle-backed and on one triangular specimen a second edge had been used solely for grinding. The average dimensions of the triangular chopper-grinders are 14 by 7 by 5 cm., while the turtle-backed specimen is 13 by 8 by 4 cm.

Only one edge had been used on 14 of the 19 pebble grinders, 2 edges had been used on 3 specimens, and 3 edges on one triangular tool. The remaining grinder is unique. It is subrectangular in outline and roughly circular in cross section (dimensions: 12 by 5.5 cm.). All faces appear to have been used for grinding so that the surface is simply a series of adjacent grinding facets running the length of the stone and blending more or less smoothly one into the other. All but 4 of the others are triangular in cross section and those which were sufficiently complete for the outline to be determined are subrectangular. Their dimensions range from 8.5 by 4.5 by 3.5 cm. to 14.5 by 8.5 by 7 cm. Three of the remaining four, on which only one edge had been used, are turtle-backed in cross section and oval in outline. They are smaller than most of the triangular specimens, averaging only 8.5 by 7 by 3.5 cm. The final specimen was turtle-backed in cross section and circular in outline (10 cm. in diameter with a maximum thickness of 4.7 cm.). Both the flat surface and one edge had been used for grinding so that this tool served as a pebble grinder and as a pebble mano.

The grinding facets on all pebble grinders average between 1 and 2 cm. in width and are from 6 to 12 cm. long. The facets are slightly convex in both directions. The curvature is fairly uniform over the short dimension but in the long dimension most of the curvature occurs at the extremities. It would appear that the grinders were used in conjunction with the shallow-basin metates found at the site.

Pebble Manos. Including the artifact described above which also served as a pebble grinder, 9 pebble manos were recovered. Seven of these consist of a naturally round flat basaltic pebble of coarse texture. One or both flat surfaces were used for grinding. Both faces of 4 manos had been used and in 2 instances considerable wear was exhibited. One specimen appeared to have served also as an anvil stone. In size they ranged between 9 and 11 cm. in diameter and between 3 and 5 cm. in thickness. The grinding facets are slightly convex but as on the grinders most of the curvature occurs on the outer edges of the facet. Probably the pebble manos and pebble grinders were used on the same or similar metates.

The texture and appearance of the remaining 2 manos differ somewhat from the above and they may have served a different purpose. Both are angular fragments of fine-grained basaltic rock, one face of which has been worn flat and smooth. Because of the nature of the rock these use facets instead of being somewhat rough appear highly polished. In size they are 9 by 6 by 3.5 cm. and 7 by 4 by 3.5 cm. although this latter may be only a fragment.

Metates. Fifteen complete or partial shallow-basin boulder metates were recovered. They consist of large, generally subglobular, coarse-grained basaltic boulders unmodified except for the grinding area which occurs on naturally flattened surfaces of the rock. Almost any available rock of sufficient size with a suggestion of a flat surface appears to have been used. They range in size from 40 by 30 by 20 cm. to 25 by 25 by 10 cm. The grinding area itself is nearly circular and ranges from 10 to 20 cm. in diameter, though in one instance it is somewhat elongated (25 by 15 cm.). The edge of the grinding area extends to the edge of the boulder in only 2 instances, in the remainder it is more or less centrally located on the natural flat surface. There was no indication that the flat surfaces had been modified in any way except as a result of the actual grinding and none appeared to have been "resharpened" by pecking. One metate was somewhat aberrant in that it was a slab-shaped rock (45 by 37 by 12 cm.) and both flat surfaces had been utilized for grinding. The greatest depth of the grinding area on all the metates ranged between 0.5 and 1.0 cm. with the exception of the largest specimen which had been worn to a depth of 2.0 cm. This metate was also one of the two on which the basin extended almost to the edges of the boulder.

Pebble Pounders. Eight pebbles of irregular shape ranging in size from 7 by 4 by 3.5 cm. to 12 by 6 by 5 cm. had been used sufficiently as pounders to permit their ready recognition. Doubtless many other rocks were so used but without resulting in sufficient modification of the pounder to make recognition possible. On all speci-

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mens the pounding had been restricted to one small area, generally an end. On one of the smaller pounders a side had been used.

Flakes and Cores. Flakes and cores were numerous (164 specimens) throughout all levels of every excavation. Most are of petrified wood although some jasper and chalcedony are present. In general the material is of poor quality. That is, it tends to fracture in an irregular and unpredictable manner. Other than the initial removal of the flake from the core, probably by percussion, there was no recognized attempt to modify the form nor any observed uniformity or pattern to the flakes themselves. Neither do the cores show any evidence of having been deliberately prepared.

If more complex artifacts of chipped stone had been encountered the majority of these flakes would doubtless be described as flint scrap but in the absence of any more complex forms the flakes themselves must be assumed to have been the artifacts desired and used. Sometimes, but not always, use chips could be observed along the sharp edges of the flakes.

The flakes varied considerably in size and shape but on an average their dimensions ranged around 4 by 2 by 0.5 cm.

Other Stone. In addition to the stone tools described above, more than 25 small naturally round or ovoid stones ranging in size from 8 by 5 cm. to 4.5 by 3.5 cm. were found, as well as 2 flat natural discs which were 8 to 10 cm. in diameter and 1 to 1.5 cm. thick. There was no discernible modification of these stones but they do not occur naturally on the hill so it is probable that the occupants of the site brought them there. As the round stones occasionally occurred in groups of four or five and several appeared to have been subjected to considerable heat perhaps they were utilized for some purpose such as stone boiling. They could also have been used to pound materials too soft to permanently scar the pounder. The flat disks would have made admirable anvil stones or could have been used to pound meat much as a modern cook uses the side of a plate.

There was one other stone ball of red-brown igneous material about the size (2 cm. in diameter) and appearance of a marble. It is very smooth, well-polished, and almost perfectly round.

Finally, there were 5 pieces of hematite. The largest is 4.5 cm. in diameter and the smallest is approximately 3 by 2 by 2 cm.

Bone. Bone was well-preserved in the Mangote shell midden and a considerable quantity was recovered. Despite this only 5 fragments of worked bone were found, all of them probably portions of awls. One form, an awl or possibly a flaker, though the ends were not scratched and scarred, was constructed from the antler of a deer. The shafts had been smoothed slightly and the ends brought to a sharp point. The antlers had apparently been broken from the skull rather than cut free. Two of the 3 specimens of this type came from deep in the West Trench while the third, a nearly complete example, came from deep in the East Trench. One of the other 2 pieces consisted of a central portion of a split deer metapodial while the other was the long bone of a bird. These pieces had been smoothed and well-polished but in neither case was the specimen complete enough to determine with assurance whether it represented a form of awl or some other implement.

Shell. Although shell was the most abundant material present only 2 intentionally modified shell artifacts were encountered. One, a shell bead, is well-smoothed and biconically drilled. It is 0.2 cm. thick with a diameter of 0.8 cm. while the diameter of the hole is 0.2 cm. The bead came from the general area of one of the 6 human skeletons found at a depth of between 40 and 60 cm. in the central portion of the East Trench. Whether the association was accidental or in the nature of a grave offering could not be determined. The second artifact, probably a pendant, came from the same area but was 10 to 15 cm. deeper than the deepest skeleton and may well not have been associated with the burials. This shell disc is about 2.5 cm. in diameter and 0.2 cm. thick. A hole 1.4 cm. in diameter had been cut through the disc slightly off center and 2 additional holes 0.2 cm. in diameter had been drilled, 1 cm. apart, through the broader remaining margin.

With pottery unknown it is probable that in addition to these shell artifacts other shells such as the large *Anadara grandis* and perhaps even the larger conches were used as receptables. No such shells had been discernably modified, however, no modification would be necessary for them to serve such a purpose adequately. Two *Anadara grandis* shells, each capable of holding better than a half cup of liquid, were found near the right side of one of the flexed skeletons. If this association was intentional it would certainly suggest their use as receptacles.

Burials

A surprising number of burials, 12 in all, was encountered, and because the bones were surrounded by a heavy deposit of shell, preservation, while not perfect, was quite good. The skulls were generally crushed or badly cracked and some of the bones, particularly the more fragile elements, were in poor condition; but in general the bones could be excavated readily and handled without fear of sudden disintegration even though in some cases they lay no more than 40 cm. below the surface. All 12 skeletons came from the 2 trenches, six from between 40 and 60 cm. and the remainder from between 100 and 150 cm. In addition more than 100 miscellaneous human bones or fragments were found scattered throughout all pits and levels.

There were 2 types of burial. The first and most interesting was a form of secondary bundle burial. Ten of the 12 bodies had been so treated. The entire body was contained in a sharply delineated rectangle approximately 50 cm. long and 30 cm. wide. The bones appear to have been placed in a flat rectangular container, possibly a basket. The skull was in the center of the north end of

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the rectangle in 7 cases (in the other 3 the skull was oriented to the east and the following description should be adjusted accordingly). The long bones were evenly divided and placed parallel to one another along the east and west sides. Apparently no attempt was made to keep the bones from one side of the body together. The vertebrae and miscellaneous foot and hand bones appear to have been placed in the center. The pelvis was at the south end opposite the skull, while the ribs were placed on top of the long bones overlapping in the center. Five of these bundle burials with head to the north were lined up in a neat row running east-west across the center of the East Trench (the trench was widened at this point) at a depth of 40 to 60 cm. Another with the skull to the east was nearby. The remainder of the 10 bundle burials were below 100 cm.

The other 2 burials were flexed. The body was placed on its back with the head to the south and turned slightly to face the east. The legs were drawn up with the knees to the east side. The upper arms were parallel to the body, and the lower arms in one case were crossed over the stomach with the hands just above the pelvis, and in the other the lower arms were placed over the chest with the hands just under the chin. These burials were both more than 1 m. deep and one was immediately adjacent to 2 bundle burials.

There was no good evidence that artifacts accompanied these burials. While cleaning above and around one bundle burial a single shell bead was encountered and on the right side near the head of one of the flexed burials there were 2 large *Anadara grandis* shells which could have served as receptables. In neither case could the association be accepted as definite.

There is one further point of interest with respect to the skeletal material. The bones of the bundle burials are scratched and scarred to a much greater degree than were the animal bones at the site and the bones of the flexed burials do not exhibit this characteristic at all. These scratches could have occurred through the action of birds and animals if the bodies were exposed, although observation of skeletons of cows and of other animals similarly treated today did not reveal any such scars. Also, the larger animals which would have been most likely to inflict such marks probably would have scattered the bones, yet few of the large bones were missing. The marks could also have been inflicted after interment through the action of rodents but the bones do not ap-

FIG. 3. Bundle burial and adjacent flexed burial, from East trench, Section 5, depth 130 cm., at Cerro Mangote.

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pear to have been disturbed. It seems possible that the flesh was stripped from the bones shortly after death by the other members of the group. The crude stone implements could easily have inflicted the damage. The flesh from the animal bones on the other hand while perhaps similarly treated may have first been softened by cooking and/or removed by the teeth rather than solely by a stone knife or scraper so that the marks would be less evident.

Discussion

The major point for discussion is whether or not the site is truly preceramic, since absence of pottery does not alone prove that a group did not practice the ceramic art or was not contemporaneous with nearby pottery making groups. As a matter of fact 5 sherds were encountered at the site. Four of these, all from a large necked jar with a red slipped lip of a type quite common in nearby polychrome pottery sites, came from on and immediately below the surface of Pit IV. The fifth sherd, of the same type as the others, was first seen in the dirt being thrown out of the 135 to 150 cm. level of Pit III. The soil of Pit III was extremely loose and sandy and the workmen climbed in and out of the pit twice during the excavation of each level. There is no question in my own mind but what the association of this sherd with this depth is entirely accidental; and that the sherd, along with dirt and much dust, dropped to that level from on or very near the surface simultaneously with one of the workmen.

Ignoring for a moment the nature of the stone inventory which is totally unlike that of any of the known pottery bearing sites other than Monagrillo, it seems highly unlikely that the site could represent a shellfishing station of pottery making people permanently located elsewhere. Such a suggestion might be based on the assumption that since the shellfishing expeditions would be temporary in nature no fragile artifacts such as pottery would be brought along. Such a supposition, however, goes against all the available evidence for this section of Panama. A large number of shell middens representing a wide time range have now been surveyed along the Bay of Parita (Willey and McGimsey 1954, and by the author during the 1955 field season), some so small as to contain considerably less than 1 cu. m. of material; yet at all of these sites it was possible to pick up 20 to 30 sherds even without excavation. At Cerro Mangote 30 cu. m. were excavated and carefully searched, yet only 5 sherds were recovered, all probably from on or very near the surface.

It is also difficult to conceive of the site as that of a culturally impoverished group living contemporaneously with pottery making people. The area around the site was one of the most popular and most densely populated throughout the known prehistory of Panama. A complete lack of intercommunication and trade within such a small, heavily populated, and easily traversed region while perhaps not impossible would certainly be surprising and would require considerable evidence for proof.

If there was any evidence other than the occurrence of 5 sherds of dubious contemporaniety to indicate that the site was nonceramic rather than preceramic there might be some justification for serious consideration of the possibility, but there appears to be none. The location of the site, the diet, the artifact inventory, particularly the pebble tools, and the lack of pottery in positive association all point to the site's preceramic nature.

Up to this time the Monagrillo culture was the earliest reported from Panama. Its artifact inventory includes pebble choppers and grinders, boulder metates, roughly flaked stones, pestles, hammerstones, a stone bowl fragment, and simple pottery, generally plain but with some red painted and incised pieces. If pottery is subtracted from the Monagrillo culture the artifact inventories of the 2 cultures, while not identical, closely parallel one another. In fact the pebble choppers and grinders, the most distinctive Monagrillo artifact, are indistinguishable from those found at Cerro Mangote. In short, the material culture present at Cerro Mangote is precisely what might be predicted, from the Monagrillo cultural inventory, for a group living in the area at a time prior to the introduction of pottery.

There are differences between the 2 cultures besides a lack of pottery in one, although that is the most important single factor. Stone vessels, pestles, rectangular manos, and well-chipped flakes do not occur at Mangote, whereas round pebble manos are not a part of the Monagrillo culture. Some of the Monagrillo flaked stone is more carefully worked than anything found at Cerro Mangote. One of the most striking differences, however, is the large relative and absolute number of stone tools encountered at Cerro Mangote. There an av-

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erage of nearly 8 stone tools were found for every cubic meter removed, proportionately 12 times as many as came from the Monagrillo mound (He-5).

One explanation for the sheer number of stone artifacts may lie in the fact that since the tools required only a minimum of preparation or none at all the life span of individual artifacts was less than would have been the case with artifacts whose manufacture required considerable effort. As for the greater concentration of stone tools at Cerro Mangote perhaps the family or subsistence unit was smaller. The assumption being that each subsistence unit would use its own tools thereby increasing the per capita number of tools and their concentration in the refuse. Another possibility would be the introduction or increased use of wooden implements for crushing or pounding in the Monagrillo culture. Doubtless there are other possible factors as well.

Other than the Monagrillo culture there is almost no material with which the Mangote artifacts can be profitably compared. The distinctive tool types are few, consisting solely of the pebble tools: the choppers, grinders, and perhaps the manos. The remainder of the stone tools, the crude flakes, the pounders, and the shallow-basin boulder metates, the bone awls, shell beads, and pendants have such a wide distribution in space and in time as to be almost useless for detailed comparisons. A thorough search of the literature was made for references to tools resembling the pebble choppers and grinders in connection with writing the Monagrillo report but without success. Since then there has been one find of very similar tools which would seem to have considerable significance. In the summer of 1954 Ricardo Alegría of the Puerto Rican National Museum and H. B. Nicholson of Peabody Museum, Harvard University, discovered and excavated a preceramic cave site in Puerto Rico. Willey observed the material from this site and was of the opinion that some of the tools are identical to the Monagrillo pebble choppers and grinders (since this was written a preliminary report has appeared: Alegría and others 1955). The finding of this rather distinctive tool type in a preceramic context in Puerto Rico as well as in Panama provides a tantalizing suggestion of a pre-Formative Circum-Caribbean continuity which only further research can prove or disprove.

Summary. Cerro Mangote (Co-40) is a preceramic shell midden located in the Province of Coclé in western Panama. It is situated atop a small hill on the north bank of the Rio Santa Maria. At present the sea lies 10 km. east of the site but a study of the coast line and its changes made in connection with the Monagrillo shellmound 15 to 20 km. to the south suggests that at the time Cerro Mangote was occupied the sea was considerably nearer, perhaps within a kilometer. The intervening area (now potrero) probably consisted of a shallow lagoon and/or alvina-like tidal flats such as border the sea at the present time.

The occupants appear to have relied primarily on shellfish, supplemented by hunting, for their protein and doubtless the wild fruits and seeds which abound in the area also contributed to their diet. The possibility of agriculture cannot be absolutely denied, of course, but there certainly is no evidence that it was practiced. Most of the shellfish utilized are types found in mud, in tidal flats, and around mangrove trees. The variation in the species of shellfish eaten probably reflects little more than the variation and extremely localized nature of the supply, for beds are easily exhausted. Throughout the occupation of the site crab and oyster were the most popular species and at varying times one was used almost to the exclusion of the other.

With mud flats and the sea on one hand, the river on another, and grass and woodlands reaching to the foot of the hill on the remaining sides the site was well suited to the economic needs of the occupants and apparently it was occupied more or less continuously over a considerable period of time. The site was high, which not only put it well out of reach of violent sea activity but exposed it to the cooling winds which blow almost constantly from the north during the hottest part of the dry season. This latter factor may well account for the site's location on the north slope of the hill.

The picture presented is that of a fairly permanently situated small group, almost certainly larger than a single extended family, which lived by gathering shellfish, wild plants, and some hunting. Wooden weapons and/or traps and drives may have been used exclusively in hunting for no stone projectile points were encountered. They prepared their food by grinding it on boulder metates with pebble

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grinders, choppers, and manos, and possibly cooked it by a stone boiling technique. Basketry or weaving may have been known to them for the bones of their dead, stripped of flesh, appear to have been placed in some container such as a basket or net. Most but not all of their dead were so treated; others were buried on their backs in a flexed position.

How long this group existed before the introduction of pottery is not known; however, when pottery was introduced it appears to have wrought little immediate change. The succeeding Monagrillo people lived in much the same manner although they were well acquainted with ceramic techniques. Perhaps the introduction of pottery was not in itself as important as the possibly implied opening of channels of communication, however indirect, with the more advanced Formative cultures to the north and/or to the south. For along this line of communication probably flowed the ideas and even the artifacts which were to provide the stimulus which would transform the relatively simple Mangote and Monagrillo cultures into the socially, politically, and aesthetically complex groups met by the Spanish in 1516. On the other hand if it can be established that these channels of communication were already operative during the pre-Formative the transition from the Mangote culture to that of Monagrillo would probably be indicative of the invention of pottery at some point along the channel rather than simply the development of a more far-flung network of stimulus diffusion and trade.

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