

BECAN: AN EARLY LOWLAND MAYA FORTIFIED SITE

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In 1934 the Third Campeche Expedition, led by Karl Ruppert and John Denison, discovered an impressive lowland Maya center in southeastern Campeche, Mexico (Fig. 1). A quick but remarkably accurate survey of the site revealed a huge system of earthworks, 1.2 miles in circumference, completely surrounding the ceremonial center. Ruppert and Denison unhesitatingly identified these earthworks as a formidable defensive system and christened the site Becan (ditch filled with water), on the assumption that the main element of the fortifications, the ditch, had originally functioned as a moat, or a water-filled barrier (Ruppert and Denison, 1943:54).

The presence of extensive fortifications, or indeed of any fortifications at all, at a Lowland Maya site of apparent Classic age was surprising and rather embarrassing to archaeologists because of the then prevailing view of Classic Maya society as essentially theocratic and peaceful. J. E. S. Thompson, perhaps the most influential proponent of this "peaceful Maya" viewpoint, speculated that the moat had been hurriedly built, though perhaps never finished, by a local elite group in terminal Classic times (1954:107). Pollock denied that the earthworks were fortifications at all, suggesting rather that they were the remains of vast borrow-pits (1965:395). Other authorities were less skeptical. Eric Wolf accepted Ruppert's and Denison's claim that there were formal fortifications at Becan and supposed that their existence was due to the fact that Becan dominated an important trade route (1959:109). Pedro Armillas, who seems to have been convinced that warfare was an important process in Maya society throughout the Late Classic, accepted with remarkable prescience the Becan earthworks as the oldest fortifications in Mesoamerica (1951:78).

Rapidly accumulating data such as the Bonampak murals, the Tikal earthworks (Puleston and Callender, 1967), and Proskouriakoff's inscriptional studies (1961, 1964, 1965) certainly indicate that inter-center warfare was conspicuous during the Late Classic. Personally I have always been quite suspicious of the assumption that the Lowland Maya were more docile than other similarly complex societies. I hypothesize specifically that warfare was an important process in shaping the development of Maya society throughout the entire Classic period. The earthworks at Becan provided an excellent opportunity to test this hypothesis.

The Becan Project, headed by Prof. E. W. Andrews IV and funded by the National Geographic Society, was organized to fill in, so far as possible, the gap in our archaeological knowledge which exists between the great Petén sites and those of northern Yucatan. During the 1970 field season I was entrusted with the investigation of the earthworks, which I had first seen in 1968. My immediate goals were: 1) to demonstrate conclusively that the earthworks had functioned as fortifications; 2) to expose enough constructional details so that a reasonable reconstruction of the defenses could be made, and 3) to properly date the original construction of the defensive system.

#### Site Description

Becan, although by no means as impressive as the great Petén sites such as Tikal or Uaxactún, compares very favorably in size to neighboring centers in the Chenes - Rio Bec area (Oxpemul, Calakmul, Naachtún). The major architectural complexes at Becan have been superbly described and mapped by Ruppert and Denison. For our purposes it is sufficient to note that there are three main plaza groups consisting of numerous well-oriented structures, some of which are preserved to

heights of 20-30 m. (Fig. 2, endpocket). Most of the standing architecture exhibits excellent workmanship and many structures, such as Structure IV, combine both 'palace' and 'temple' elements.

The earthworks surrounding the ceremonial center consist of three main components. The basic component is a wide, deep, kidney-shaped ditch excavated in limestone bedrock. This ditch generally follows the edge of the elevated outcrop on which the major architectural complexes are located and encloses an area of 18.6 hectares or about 46 acres. Around the inner lip of the ditch are the remains of a steep embankment formed by the excavated material. Seven causeways span the ditch, positioned to provide the greatest access to the southeastern and northwestern sections of the site where there are concentrations of large structures.

In addition to the artificial components of the earthworks Becan is further screened by a series of swamps, or bajos, which would seriously have hindered the approach to the site from the south, west, and northeast. The southern swamp presently holds water year-round while the other two swampy areas have silted up; both of the latter almost certainly contained water when the site was occupied.

### The Excavations

A series of 37 test excavations probed the deep sediments in the ditch bottom and the immediately adjacent deposits both inside and outside the ditch, with particular emphasis on the inner embankment. Larger exposures were made near four of the seven causeways (I, II, VI, VII) and three major cuts were made into the embankment to determine its internal construction. Structural excavations focused on six buildings of various sizes that are in close association with the embankment or the ditch. Arbitrary and natural stratigraphic units were utilized depending upon the nature of the deposits encountered in the excavations. We also constructed a detailed contour map of the earthworks and added the contours to the original architectural map drawn up by Ruppert and Denison in 1934 (Fig. 2).

### Reconstruction

The Ditch - The most prominent feature of the Becan earthworks, the great ditch, has a circumference of 1890 m. It originally averaged about 16 m. in width and, judging from the numerous bedrock outcrops still visible, the sides of the ditch must have been near-vertical. Our test pits in the ditch bottom revealed unexpectedly deep accumulations of sediment - averaging 2.8 m. - most of which was derived from the erosion of the adjacent embankment. The total average depth of the ditch, measured from the clearly visible outside lip, is 5.3 m. or just over 17 feet. Since the ditch conforms well to the slightly elevated outcrop on which Becan is situated the depth, calculated from the inner lip, would be a meter or so greater.

Although the general configuration of the ditch is fairly uniform there is some fluctuation in depth, and especially in width, suggesting that the original construction was a mass effort aimed at speedy completion rather than architectural virtuosity. We found no indications that the ditch was anywhere unfinished. There is a 7-10 m. rise in absolute elevation of the ditch bottom from southeast to northwest (the relative depth remaining constant), clearly showing that the ditch could not have functioned as a water-filled barrier since no constant water level could have been maintained. No traces of any sort of clay seal or artificial lining were encountered, so that any water would quickly have disappeared into the porous limestone. Water-deposited sediments were found in the bottom

of the ditch only in a localized area on the northeastern periphery of the site where an old bajo encroaches on the earthworks.

The original construction of the ditch necessitated the removal of approximately 117,600 m<sup>3</sup> of fill, about two-thirds of which, by volume, was the unconsolidated limestone known to Maya archaeologists as sascab. The geological situation in the Becan region facilitated the excavation of the ditch because there is only a thin crust of hard limestone, varying in depth from a few centimeters to several meters, overlying enormously deep deposits of sascab. I have never observed any sort of massive, hard formation underlying this sascab in any of the numerous road-cuts along the Escarcega - Chetumal highway, many of which are 30-40 feet deep. Once the crustal material was removed the excavators had only to contend with the sascab, which could easily be dug out even with primitive tools.

The Embankment - Most of the sascab removed from the ditch was immediately heaped up along the adjacent inner lip to form a wide, steeply-banked embankment, burying the old topsoil and at least one good-sized structure. No corresponding deposits were found anywhere on the outer lip of the ditch. Very little rock was encountered during our explorations of the embankment; since a considerable amount of hard limestone crust was obviously excavated this material must have been hauled off for other purposes.

Judging from our excavations and contour maps the embankment must have originally been at least 10 m. wide and frequently even wider. Although now diminished by erosion it is still preserved in some places to a height of up to 3.6 m. (Fig. 3-this profile was taken from a long trench just to the east of Causeway I). Putting a conservative estimate of the average reduction in height through erosion and root action at 2 m., the original average height would have been somewhat more than 5 m. Calculations derived from 40 ditch-embankment profiles made in the course of mapping indicate that the average critical depth of the embankment and inner ditch slope, taken together, would have been 11.6 m. or almost 38 feet - a really formidable vertical obstacle. The embankment shows considerable variation in height, and although much of this variation is obviously due to later robbing and leveling there is a marked tendency for the embankment to be lower in those areas where swamps are found just outside the ditch. Presumably attack from across these swamps was considered unlikely.

When first built the embankment probably exhibited a steeply-banked profile such as shown in Fig. 8. Since redeposited sascab is quite unstable the slopes may have been packed or faced in some manner. Several of our trenches turned up traces of such features. Low stone retaining walls were uncovered along the inner edge of the embankment in two places, and concentrations of stone rubble elsewhere suggest that such walls may have been common. Retaining walls along the outer edge of the embankment, if they once existed, have long since crumbled into the ditch. While excavating on the embankment we watched carefully for any indications of a timber palisade but none were found. I suspect that such a palisade was originally associated with the embankment, but if so the severe erosion of the outer slope long ago wiped out all traces of it.

The Causeways - Seven causeways span the ditch at intermittent intervals, providing greatest access to the northwestern and southeastern sectors of the site where concentrations of large structures are found. Five of the causeways were obscured by debris, making it impossible to discern the nature of their construction from surface examination alone; four were ultimately tested with excavations. The remaining two causeways (III and V) were obviously bridges on natural limestone and one of these (V) had a wide section chopped out of it.

Our excavations clearly demonstrated that all of the causeways were originally masses of natural limestone bedrock that were simply left in place when the ditch was excavated (Fig. 4). The sides of the causeways flare outward toward the bottom of the ditch, giving them somewhat trapazoidal cross-sections (Fig. 5). They range from 12 to 18 m. in length and were originally 3.5-4.5 m. wide. The tops of those causeways excavated are elevated 4.5-6 m. above the bottom of the adjacent ditch. Traces of rubble pavings and low stairways were uncovered at the inner ends of Causeways VI and VII. Causeway II is unique in that it consists of a natural sascab substructure supporting two rough stone retaining walls between which is sandwiched a layer of artificial fill. This artificial superstructure may represent either a consolidation of the causeway or repair of a section removed for defensive purposes.

Large sections were chopped out of at least two of the causeways in prehistoric times, rendering them impassable. The gap in Causeway VII was subsequently repaired, but that in V was left open, or perhaps spanned by some sort of perishable material. After the earthworks had been in existence for some time each causeway (except III and possibly V) was artificially widened or consolidated by the deposition of masses of fill in the adjacent ditch; Puleston and Callender (1967) report similar widening of one of the Tikal causeways. Most of the necessary fill for the widening operations seems to have been robbed from nearby sections of the embankment, which are characteristically lower near the causeways. None of the excavated causeways had been pierced to allow the circulation of water necessary in a true moat. Given their construction such piercing would have led to quick collapse.

No evidence was found for additions, repairs, or alterations of the earthworks except those previously mentioned, nor is there any reason to believe that the various sections of the ditch were not constructed pretty much at the same time. The overall coherence of configuration suggests to me that the earthworks were thrown up in one fairly continuous effort. Quite probably there were initially serious efforts made to keep the ditch from filling with debris, and only minor maintenance would have been necessary to stop serious erosion on the embankment.

#### Functional Interpretation

Obviously, the best way to determine the function of any sort of structure is to have direct access (e.g. historical accounts) to the intentions of its builders. Since this sort of information is inaccessible to the prehistoric archaeologist there are several other ways to attack the question. One way is to show that a structure actually did function in a particular manner - in this case as a defensive barrier. Unfortunately, we have no direct evidence (e.g. extensive burning, projectile points imbedded in the embankment, or corpses strewn about the bottom of the ditch) that the Becan earthworks were ever attacked. In a sense the most successful defensive system is one that so overawes its enemies that it is, in fact, never assaulted, so the negative evidence from Becan does not help us one way or the other.

Another approach is comparison with structurally similar defensive systems used in other regions. Earthwork banks and ditches built for defensive purposes were commonly used in other cultures, including those of pre-Roman Europe (Piggott, 1965:202) and Neolithic and Bronze Age China (Chang, 1968). Unfortunately we have almost no ethno-historic or archaeological evidence for analogous structures in Mesoamerica so no direct comparisons are possible.

For Becan we must fall back on another way of resolving the problem; we must show that the configuration of the earthworks was consistent with the idea of a defensive function and inconsistent with the other most obvious alternatives. In this connection there can certainly be no doubt that the Becan earthworks, as reconstructed above, constituted a formidable barrier and would have enormously restricted access to the site. Neither can there be any doubt that the general layout and sheer size of the earthworks would have conferred great military potential on the site. But what about alternative functions?

One possibility is that the ditch and embankment were constructed simply to delineate the boundaries of the community and to insure the privacy of the privileged few who lived within it. Such may have been the function of the Mayapán wall. I think we can reject this possibility because of the large scale of the earthworks; they are certainly disproportionately large to have served such a casual purpose, especially considering the limited manpower resources of a small site like Becan. If the scale of the earthworks was proportionate to some perceived threat, I suggest that this threat could only have been hostile military aggression.

Pollock (1965:395) denied that the earthworks were fortifications at all and described the ditch rather as "...a great borrow-pit from which the city was built". Now there is no question that materials from the ditch, notably hard caprock, were hauled off for use elsewhere, but neither is there any question that the main function of the earthworks was to keep people out; they still do so pretty well today even in their ruined condition. The point is that the functions of borrow-pit and defensive ditch are by no means incompatible; it certainly would have been surprising if stone from the ditch had not been used for other purposes since primitive quarrying techniques made rock a very valuable commodity. On the other hand, the only effective quarrying technique to use near Becan is to strip off broad, shallow layers of caprock; the ditch, by contrast, is narrow and deep. Sascab was removed from the ditch in far greater quantities than any conceivable architectural project would have warranted, and virtually all of it was immediately redeposited along the inner lip to form a high embankment, with no corresponding feature on the outer lip. This pattern clearly suggests a defensive function.

Borrow-pits aside, only two other functions for earthworks on this scale come easily to mind - water control and ceremonialism. The configuration of the ditch, its relation to the surrounding topography, and the lack of water-deposited sediment in it rule out water control as an explanation. So far as I know, there is absolutely no evidence for ceremonial earthworks, such as those found in the eastern United States or associated with henge monuments in Britain, from anywhere in the Maya area, and on this basis I rule out ceremonialism as an explanation as well. Having disposed of these alternative possibilities I think that the Becan earthworks can most effectively be interpreted as massive fortifications.

We are now in a position to dispel two misconceptions about the earthworks at Becan: 1) the site was surrounded with a water-filled 'moat'; 2) the defenses were never finished.

Armillas objected to Ruppert's and Denison's interpretation of the Becan ditch as a 'moat' on the obvious grounds that the local limestone is too porous to hold water (1951:78). Our excavations have confirmed this view. The lack of any sort of lining or seal, the few water-deposited sediments, the unpierced causeways, and the undulating level of the ditch bottom all lead to the conclusion that the ditch was never intended to hold water.

The supposition that the fortifications were unfinished derives logically from the 'moat' interpretation since it was obvious even to the original inves-



tigators that certain essential features of such a construction were lacking. Our excavations demonstrate conclusively that the earthworks surrounding Becan should be regarded as finished products both in terms of size and configuration. Their present ruined condition, with the eroded embankment, silted-up ditch, and crumbling causeways, contributes to the impression of incompleteness.

The Becan earthworks represent one of the simplest yet most effective types of defensive systems - the dry ditch and parapet (Fig. 6). Such systems have a number of advantages in addition to their simplicity. They do not rely on naturally strategic positions for defensive strength; but can be erected wherever soil, bedrock, and water table permit suitable excavation. No architectural sophistication is necessary for their design or execution and they are easily built even with unskilled labor forces. Earthworks are cheap because they do not consume valuable commodities such as rock or timber, they are not particularly perishable and, if properly maintained, will last almost indefinitely.

Becan is not, of course, a true fortress but rather a fortified ceremonial center. Its defensive system was built to protect the internal structures and there is a clear distinction between military and ordinary civic architecture at the site. We found no evidence that any sizeable permanent structures were ever built as integral parts of the defensive system. Most of the visible internal architecture post-dates the construction of the fortifications, however, and may well have been arranged with an eye to defense. For example, several of the large plaza groups present high, blank, rear walls to the ditch, particularly in the east and north. Some of the high linear structures which partially delineate plazas at Becan may also have been potential second lines of defense. Although outlying architectural complexes are numerous on the high ground in the immediate vicinity of Becan only two structures of any size are within 100 m. of the ditch; one of these, Structure XXIII, was erected long after the earthworks were completed while the other is yet undated. It is tempting to speculate that there was a deliberate attempt to restrict building near the outside of the ditch in order to deny external strong-points to enemies.

In terms of military architecture the fortifications at Becan are unsophisticated, lacking special features such as projecting bastions, as seen on South American fortifications such as Paramonga (Robertson, 1968) and fortified villages in the eastern United States (Larson, 1972), or the multiple lines of defense found in some strongholds in the Central Highlands of Mexico (Armillas, 1951). They derive their main defensive strength rather from sheer size. In addition to the impressive height of the ditch-parapet slope (averaging almost 12 m.) the extreme width of the ditch itself would have been a formidable obstacle to attackers. Heavy missiles can only be thrown with great difficulty from the embankment to the outer edge of the ditch in most places. To throw 'uphill' from the outside is almost impossible.

The evaluation of the effectiveness of any system of fortifications presupposes some knowledge of the military traditions, organization, and skills of the people who built it or who could be expected to attack it. Unfortunately we have almost no direct evidence concerning warfare among the Classic Maya and are forced to fall back on the more well-documented conflicts of Protohistoric and Postclassic times. Such late patterns of warfare seem to have emphasized, in typically Mesoamerican fashion, the ritual aspects of conflict with rather poor development of technological and organizational skills (Tozzer, 1941). The Maya could quickly muster very sizeable forces. Bernal Diaz, who participated in some of the early Spanish skirmishes with the inhabitants of Yucatan, reported that 8,000-12,000 warriors were sometimes involved. Even allowing for the expected exaggerations of

an old soldier these figures are impressive. I suggest, however, that large forces could not operate for any great length of time in hostile territory due to logistical difficulties.

It seems safe to assume that military capabilities in Classic times were at least potentially somewhat more effective, especially in the size and organization of the forces involved, and possibly in their logistical support as well. On the other hand weapons technology was probably no better than in the Postclassic - in fact if the bow and quilted armor were late Central Highland introductions the warriors of the Classic period might not have been as well equipped as their Postclassic descendants. In any event the weapons used by the Maya seem best suited to close hand-to-hand combat, with missiles playing a minor role. We certainly have no evidence of any sort of siege machinery. Assuming that formidable fortifications were more common in the lowlands than ordinarily supposed and weapons and logistical systems as weakly developed as suggested above, peculiar patterns of warfare might be expected. Traditionally, when Lowland Maya warfare has been mentioned at all, it has often been characterized as consisting of quick raids (e.g. see the discussion of the Bonampak murals, Ruppert, 1955). The implication seems to be that such raids should not be considered really significant, since they do not conform to the popular conception of 'large-scale' warfare; objectives are usually interpreted as being very limited, for example the acquisition of sacrificial victims.

But if there was a disparity between defensive and offensive capabilities then the quick raid might well have been the most effective offensive strategy, catching otherwise impregnable enemy strongholds by surprise and possibly also disrupting the agricultural cycle, thus wearing down a weaker opposing center by attrition. In other words, the swift, sharp 'raid', generally considered a form of small-scale conflict, might, in lowland circumstances, have had large-scale political effects. A similar pattern for Mississippian warfare in the southeastern United States has been suggested by Larson (1972:390).

When considered in light of the above interpretation of Maya warfare the Becan fortifications emerge as very impressive indeed. Assuming that a sufficient number of defenders, say several thousand, were able to shut themselves up inside the earthworks they could easily be defended - the only really vulnerable points are the causeways. Simply to invest the site would require a force of 2000-3000 men. Assaults across the ditch would have been very costly and, lacking siege machinery, the only alternative would have been to starve the defenders out. But if the sustaining hinterland of Becan remained hostile to them, the invaders might well have starved before the defenders. There is ample storage space for provisions inside the earthworks (e.g. in the huge, dry, roughly-finished chambers deep within the substructure of Structure VIII), and the remains of what is almost certainly a large aguada can be seen just to the south of Structure XIII.

We have no direct evidence that the site was ever actually assaulted, let alone taken. There are no signs of extensive destruction or massive intrusion of 'foreign' elements, nor is there a hiatus in occupation. The purposeful cutting of Causeways V and VII is, to be sure, most explicable as a reaction to some perceived threat, but since the other causeways were unaffected the threat may never have materialized. On the other hand the in-filling of the ditch near several of the causeways sometime during the Late Classic does not mean that the defensive system had become superfluous - the earthworks would still have been quite defensible. Whether Becan was ever attacked or not one point stands out - warfare was a very serious business.

The construction of a defensive system usually differs in one important respect from the construction of ordinary civic architecture - time is crucial. In estimating how quickly the fortifications at Becan could have been built in a pressure situation I have applied Erasmus' calculations, derived from his experiments on the excavation and transportation of earth and rock using primitive tools (1965). Roughly 117,600 m<sup>3</sup> of fill, including both caprock and sascab, were removed to create the ditch. Assuming that two-thirds of the excavated material was sascab about 352,821 man-days would have been required to dig out the sascab and overlying caprock and move them the required distances. This estimate is only approximate because Erasmus did no experiments with sascab but rather with hard earth, which was probably somewhat less resistant. I regard this amount of labor-expenditure as minimal, however, since it does not take into account the disposal of most of the caprock at an unknown distance from the ditch nor the construction of facings, pavings, retaining walls, or timber palisades.

If only adult males worked on the defenses 10,000 men could have accomplished the task in a little more than a month. The demands of the milpa cycle are not so rigorous that even 35 continuous days of corvee labor are unreasonable, but the labor force suggested seems disproportionately large for a center the size of Becan. In order to command such a force Becan would have had to control a sustaining area with a radius of about 24 km., assuming a population density of 75 people per square mile. Several other impressive centers, such as Calakmul, Rio Bec, and Oxpemul, are all within 60 km. of Becan and must have had sizeable sustaining areas of their own. Since the earthworks were erected at a very early date (see below) it is possible that Becan then controlled a larger area than it did after the florescence of these neighboring centers. Personally I suspect that the fortifications were built by far fewer than 10,000 men, all drawn from the hinterland that Becan itself controlled, over a more protracted period of time - say a year or two. If correct this assumption would point to a strong, but rather distant threat to Becan as a politically autonomous community. It should be noted in passing that Ruppert and Denison found a fragment of a very large stone wall at Calakmul, though they did not interpret it as a fortification (Ruppert and Denison, 1943).

### Chronology

Some 33,000 identifiable sherds were recovered from our excavations in the vicinity of the fortifications and form the raw data for the following chronological interpretations. Trenches in the ditch alone turned up 11,297 sherds, 86.7% of which were assigned to the Acahual-Bejuco ceramic phases (Late Classic, Tepeu 1-2. ca. A.D. 550-750). Early Classic (5.5%) and Preclassic (2%) complexes were less well represented. The Late Classic material provides only a terminal date for the construction of the ditch; in fact sherd distributions and test-pit stratigraphy suggest that the bulk of the Late Classic sherds were deposited after a period of weathering of the ditch bottom and during the initial stages of serious erosion of the embankment (i.e. the defensive system was beginning to fall into disrepair during Late Classic times). Our excavation strategy for the ditch also unfortunately skewed our ceramic samples so that a disproportionately large amount of later material was recovered.

More reliable information comes from excavations at Causeways II and VII. Both of these causeways consist partially of artificial fill which yielded a total of 806 identifiable sherds. The latest ceramic material from these contexts relates to the Sabucan complex (Early Classic, Tzakol 3, ca. A.D. 450-550).

At face value this material merely suggests that the repairs may be of Sabucan date, but could also be later (e.g. Late Classic people could have made them using a Sabucan midden). I think it extremely unlikely, however, that two identical, widely-separated contexts would both yield abundant, completely uncontaminated early ceramic samples if they were the result of later (Late Classic) building activity. I suggest that both contexts represent Sabucan phase repairs and that the original construction of the ditch must have occurred during or prior to the late Early Classic.

Unfortunately the embankment was completely sterile in most places that we tested. Sherds which appear to be reliably sealed in the fill of the embankment or beneath it in the old topsoil layer totaled 170 Pakluum (late Preclassic, ca. A.D. 0-250) and 1 Chacsik (Early Classic, ca. A.D. 250-450). The general lack of cultural material in old topsoil itself suggests a rather early date. One of our larger penetrations of the embankment produced 1518 identifiable sherds (20% Preclassic, 80% Early Classic), all but two of which represented Preclassic and Early Classic complexes. The two Late Classic sherds from this trench were both in the topsoil and undoubtedly were dropped on the embankment long after it was built. Unfortunately the stratigraphy of this part of the embankment is confused, suggesting disturbance and trash disposal long after its original construction. But there are really only two alternative explanations: 1) the Early Classic sherd material was incorporated into the fill of the original embankment, or 2) this material was later deposited on the embankment. In either case an early date for the embankment is clearly warranted.

Fortunately we have two well-dated architectural complexes which bracket the construction of a section of the embankment and, by inference, the whole defensive system. Structure XXVII is a small building buried beneath the embankment deposits on the northern periphery of the site. Several thousand sherds and five caches associated with Structure XXVII all relate to the late Preclassic Pakluum complex. Even more convincing was the surprisingly good preservation of the structure itself - it was obviously buried quite soon after it was abandoned.

On the eastern edge of the site a section of the embankment was leveled off and a sequence of structures, the XXV complex, was erected on top of it. Here there is a demonstrable continuity of architectural activity beginning in the late Early Classic (Sabucan Phase) and lasting right through the Late Classic (Acahual, Bejuco, and Chintok phases) - all postdating the construction of the embankment.

These data clearly indicate a Chacsik phase date for the construction of the defensive system (Early Classic, Tzakol 1-2, ca. A.D. 250-450). I am inclined to place the construction rather early in this phase and even consider the outside possibility that the fortifications might be terminal Preclassic (ca. A.D. 200-250). Supporting evidence comes from the overall ceramic distribution at Becan and nearby sites; not a single Chacsik sherd has been found outside the ditch although all other ceramic complexes are well-represented both inside and out (Ball, 1972). Apparently there was a drastic contraction of the local population coinciding with the heyday of the defensive system.

#### Comparison

At this point a comparison of the Becan defenses with other Lowland Maya fortifications is necessary. Generally speaking the lowlands lack natural topographic features, such as eminences, which are such useful adjuncts to artificial fortifications in more rugged regions. The exceptions are water barriers of various sorts - rivers, lakes, swamps, and the sea. The basic defensive strategy

of the Lowland Maya was to rely on fortifications such as timber palisades, earthworks, stone or adobe walls, or combinations of these, integrated wherever possible with minor local relief or water barriers. Communities where water barriers were used in this manner include Tayasal (on an island), Xelha (on a peninsula) and Becan and Tikal (both partially protected by extensive swamps).

Until recently most of our knowledge of lowland fortifications was confined to such well-known Postclassic sites as Tulum or Mayapán, or from accounts of early Spanish explorers. Cortez, on his famous march to Honduras, encountered numerous fortified towns, some with ditches and ramparts, and others with palisades; Thompson refers to one with a barrier of living maguey (1954:106). Wooden palisades seem to have been common in the heavily forested regions of the Petén and southern Campeche, reflecting the abundance of timber. Such palisades were probably most effective in conjunction with various sorts of earthworks, especially where bedrock deposits were so close to the surface that timbers could not easily be sunk into the ground. In the northern part of the Peninsula bedrock is more thick and massive than it is, say, around Becan, and timber less abundant. Here free-standing walls seem to have been more common. I suggest that the timber/earthwork pattern is of considerable age and is indigenous to the lowlands while true walled sites are later attempts to emulate Central Highland military architecture. Note in this respect that the two most well-known earthworks, at Becan and Tikal, both date to the Classic period while Tulum, Mayapán, and Xelha, all walled sites, seem definitely Postclassic.

Fig. 7 compares five crucial variables for four fortified sites: area, perimeter (the length of artificial defensive components), mass (a rough estimate of the amount of material that had to be moved to erect the fortification), critical width (the average width of the horizontal obstacle presented to an enemy), and critical height (the average vertical obstacle).

Judging by sheer size alone Becan is far and away the most impressive of the lot. In terms of absolute volume of material moved the Becan earthworks are eclipsed only slightly by the northern earthwork at Tikal - this despite the fact that the Tikal ditch and embankment defends a perimeter about five times as long. Fig. 8 shows comparative cross-sections of various lowland fortifications. The juxtaposition of ditches and embankments clearly produces more formidable vertical obstacles than free-standing walls alone, and in this sense earthworks are more efficient in terms of labor expenditure. There is a striking similarity in general design between the Becan and Tikal earthworks, although the layout at Tikal suggests a hinterland defense while Becan more closely resembles a true citadel. Dennis Puleston suspects that the Tikal fortifications may also be Early Classic (personal communication) although the ceramic evidence on this point is almost non-existent (Puleston and Callegder, 1967:45). If this turns out to be the case there may be some sort of direct connection between the two defensive systems.

The preceding comparisons establish Becan as the most formidably defended center yet discovered in the Maya Lowlands. Like all lowland fortifications the Becan defenses seem unsophisticated when compared with later fortifications in the Central Highlands (for the best available summary see Armillas, 1951). Considering, however, that its Early Classic date (A.D. 250-450) places it at the very beginning of the wider tradition of Mesoamerican military architecture the Becan earthwork is very impressive indeed.

## Interpretation

The most crucial questions of all remain to be answered - who built the Becan defensive system and why? Chronologically the fortifications are reasonably in line with the widespread appearance of Central Highland (Teotihuacan) influences in the lowlands, influences which might expectably have caused severe political imbalances among many important regional centers. Teotihuacan influences of some sort are reflected in both ceramics and lithics at Becan (Ball, 1972; Rovner, 1972) and it is tempting to see a connection between these influences and the construction of the defensive system. But on the basis of our present knowledge the Teotihuacan influence seems rather insubstantial and dates to the fifth century A.D., perhaps as much as 200 years after the fortifications were built. On the other hand recent work at Altun Ha in British Honduras (Pendergast, 1971) suggests that highland influences on developing Maya society may have been considerably earlier than previously thought (late Preclassic, ca. A.D. 100), in which case local Maya reaction to a dangerous political situation (i.e. the earthworks) might also be unexpectedly early.

Assuming that the Becan defenses are related in some way to highland pressures two main possibilities exist: 1) the site was fortified as an outpost of Petén Maya/Teotihuacan influence (emanating from Tikal?), or 2) the site was fortified by a local Maya elite group which was resisting Petén Maya/Teotihuacan expansion. I emphasize the role of the Petén Maya here because I see no good evidence suggesting any massive intrusion or 'invasion' of highland peoples in the lowlands. It seems more probable to me that political imbalances were caused by the leaders of some lowland centers, such as Tikal, who had absorbed highland political ideas, especially concerning the use of warfare for territorial aggrandizement, and who may even have employed mercenaries from the Central Highlands.

Considering the paucity of 'foreign' elements in the architecture at Becan and the associated artifact assemblages (so far as we know them) I think we must reject the first of the above alternatives, at least for the present. It seems far more likely to me that Becan was a provincial center fortified by a local Maya elite group (or an alliance of such groups) against pressure from the great Petén sites to the south where highland influences were probably most strongly felt. The apparent depopulation of the countryside around Becan and the partial destruction of some of the causeways both point to some sort of military emergency during Chacsik times, with highland traits appearing during the subsequent Sabucan phase. These new influences are so tenuous, however, that they may easily be explained by mechanisms other than direct political domination by a 'foreign' group - e.g. trade, pilgrimage, or elite class visitations. Although Becan may well have slipped gradually into the sphere of Petén Maya/Teotihuacan political influence I would discount the possibility of a direct military takeover.

If either of the foregoing interpretations is correct two significant conclusions can be drawn. First, highland influences in the lowlands were accompanied, at least locally and on a short-term basis, by political upheaval and conflict. Such conflict probably does not reflect an actual highland 'invasion' but rather the adoption by some great Maya centers of highland patterns of aggressive expansion as an aspect of political policy. Second, local Maya elite groups responded to this threat in a decidedly warlike manner, being either capable of raising enormous fortifications themselves or posing such a threat to the Petén Maya/Teotihuacan groups that they were forced to do so. Obviously these conclusions do not accord well with the traditional view of the Classic Maya as peaceful theocrats.

An alternative explanation is that the Becan fortifications reflect large-scale warfare in the internal developmental process of Maya civilization itself. Certainly there were periods of potential crisis rather early in Maya history which might have precipitated conflict between centers - the apparent rapid population expansion of the late Preclassic is a case in point. Quite apart from such crisis situations some sites, such as Becan, may have been strategically situated to dominate important trade routes or political boundaries, an idea first expressed by Wold (1959:109). Such sites might well have been turned into fortified strongholds, although the dating of the Becan defenses seems a bit early to accord well with the idea of well-developed, extensive commercial networks as they existed in the Late Classic. In any case I would guess that there were sufficient stresses in developing Maya society so that no necessary explanations involving foreign intrusions need be sought.

In order to sort out all of these alternative explanations we must obviously do a great deal more work in the Rio Bec area and in the lowlands as a whole. Particularly crucial are:

- 1) More work at Becan to ascertain the nature and extent of 'intrusive' influences during the Early Classic phases.
- 2) Settlement surveys in the surrounding countryside to detect possible fluctuations in occupation.
- 3) Recovering of evidence that sheds light on the wider role of warfare throughout the Maya Lowlands - particularly the discovery and excavation of other fortified sites.

To sum up, Becan is, so far as I know, the oldest fortified site in Mesoamerica and certainly one of the most impressive, comparing favorably with much Postclassic military architecture. We now have clear evidence that large-scale warfare, whether indigenous or introduced, was operating in the Maya Lowlands at a very early date (ca. A.D. 250-450) and we must begin to seriously consider whether warfare, as a process, might not have helped to shape Maya society from its very beginnings as well as contributing to its ultimate destruction. An understanding of Lowland Maya warfare may provide new insights into such vexing problems as the rise and function of 'ceremonial' centers, the overall political integration of these centers, and the appearance of social stratification.

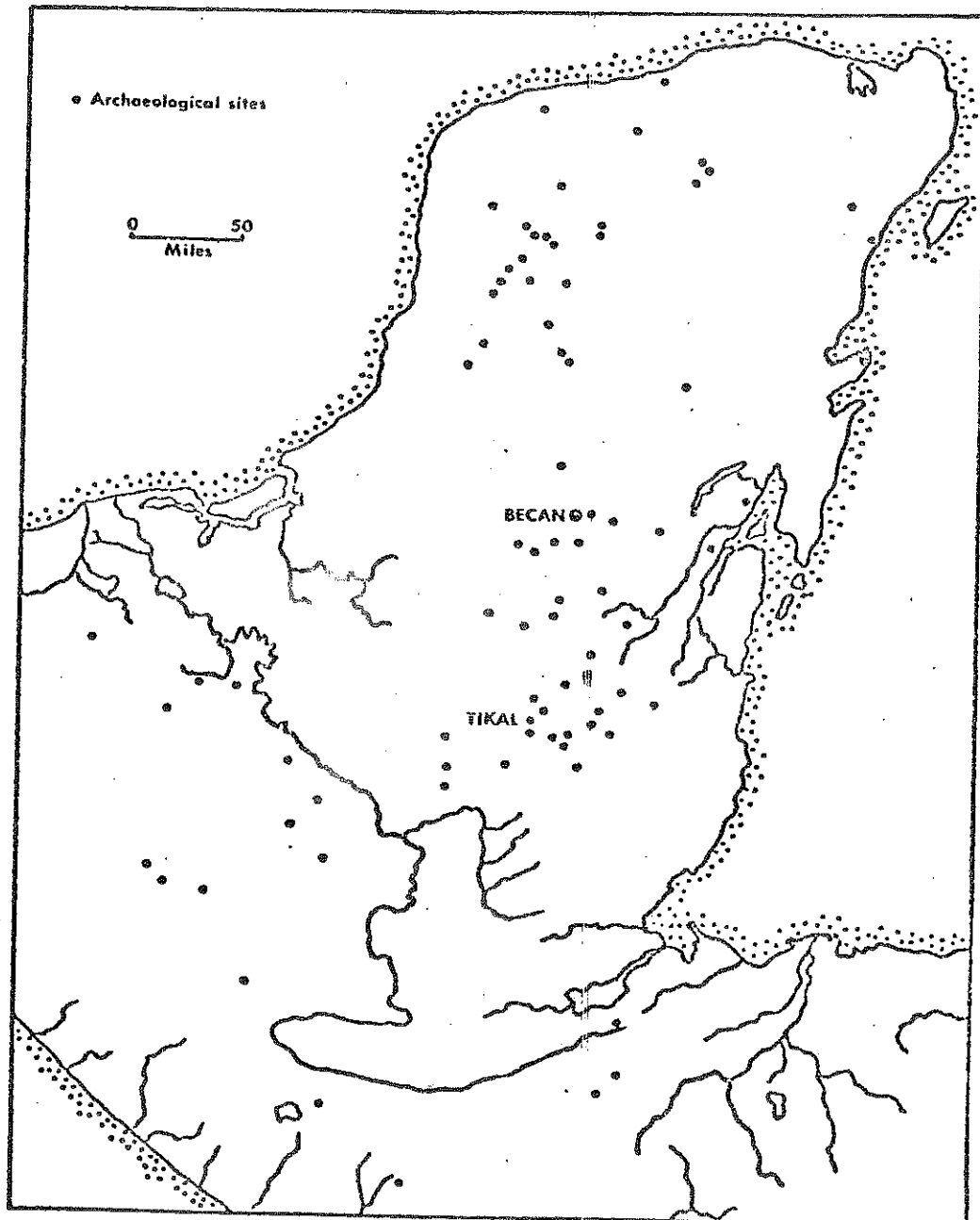
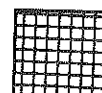
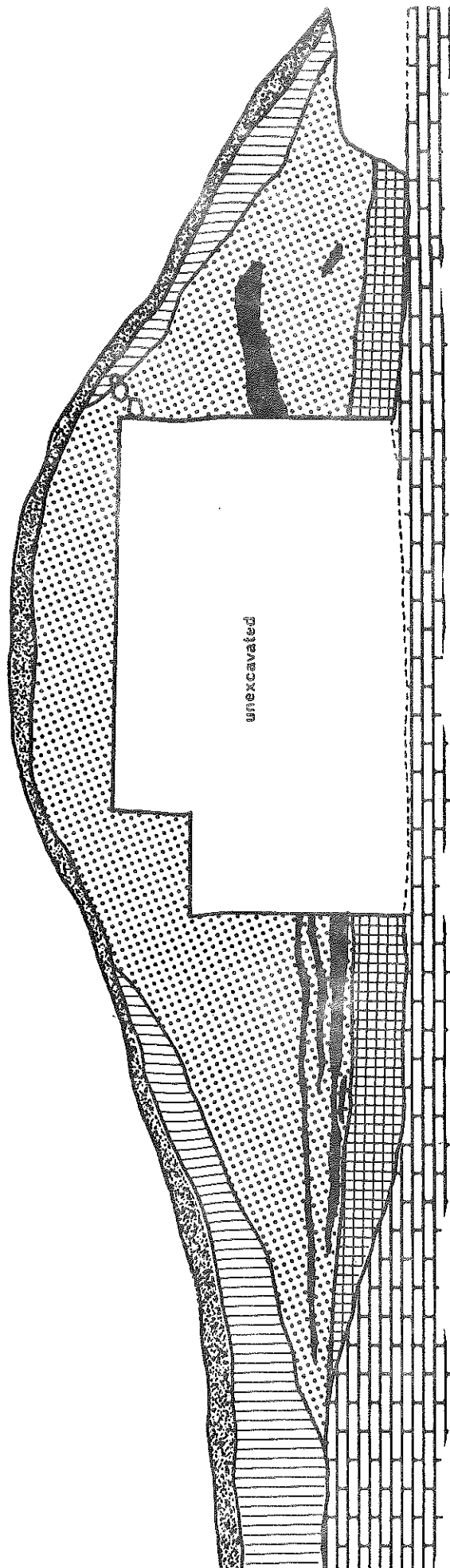


Fig. 1





Dark brown clay/humus/sascab mixture.

Light grey-brown clay/sascab mixture with many roots and limestone nodules.

Redeposited white sascab with many thin dark lenses similar in composition to underlying layer.

Black sascab/clay mixture with many limestone nodules.

Natural limestone bedrock.

0 1m.

Fig. 3  
Partial cross-section of the embankment  
immediately to the east of Causeway I.



Fig. 4

Cleared section of the earthworks showing the ditch (left), Causeway I (center), and the high inner embankment (right). For scale note the small figure of a workman crossing the causeway.

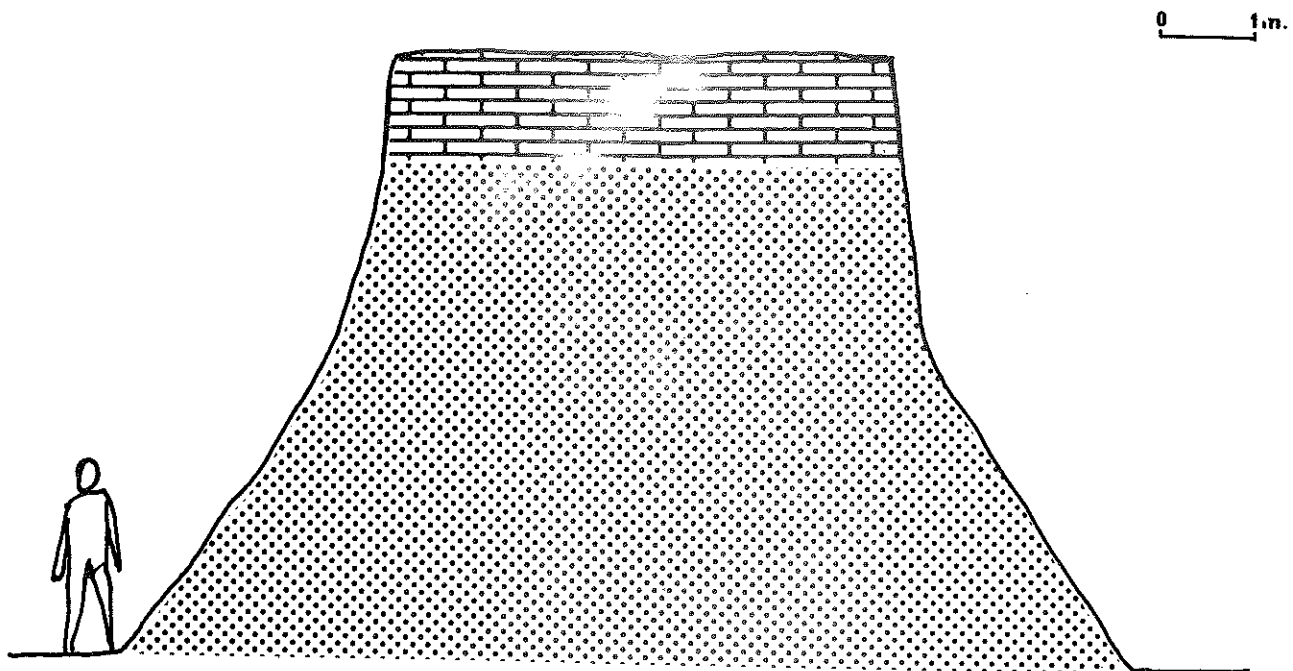
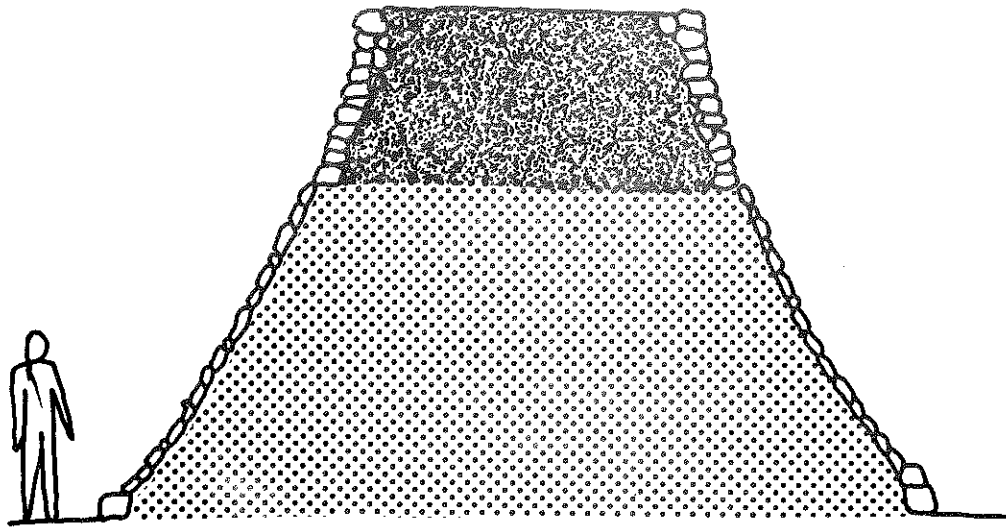


Fig. 5

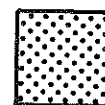
Reconstructed cross-sections of  
Causeways I (below) and II (above).



natural limestone  
caprock



dark fill



natural sascab

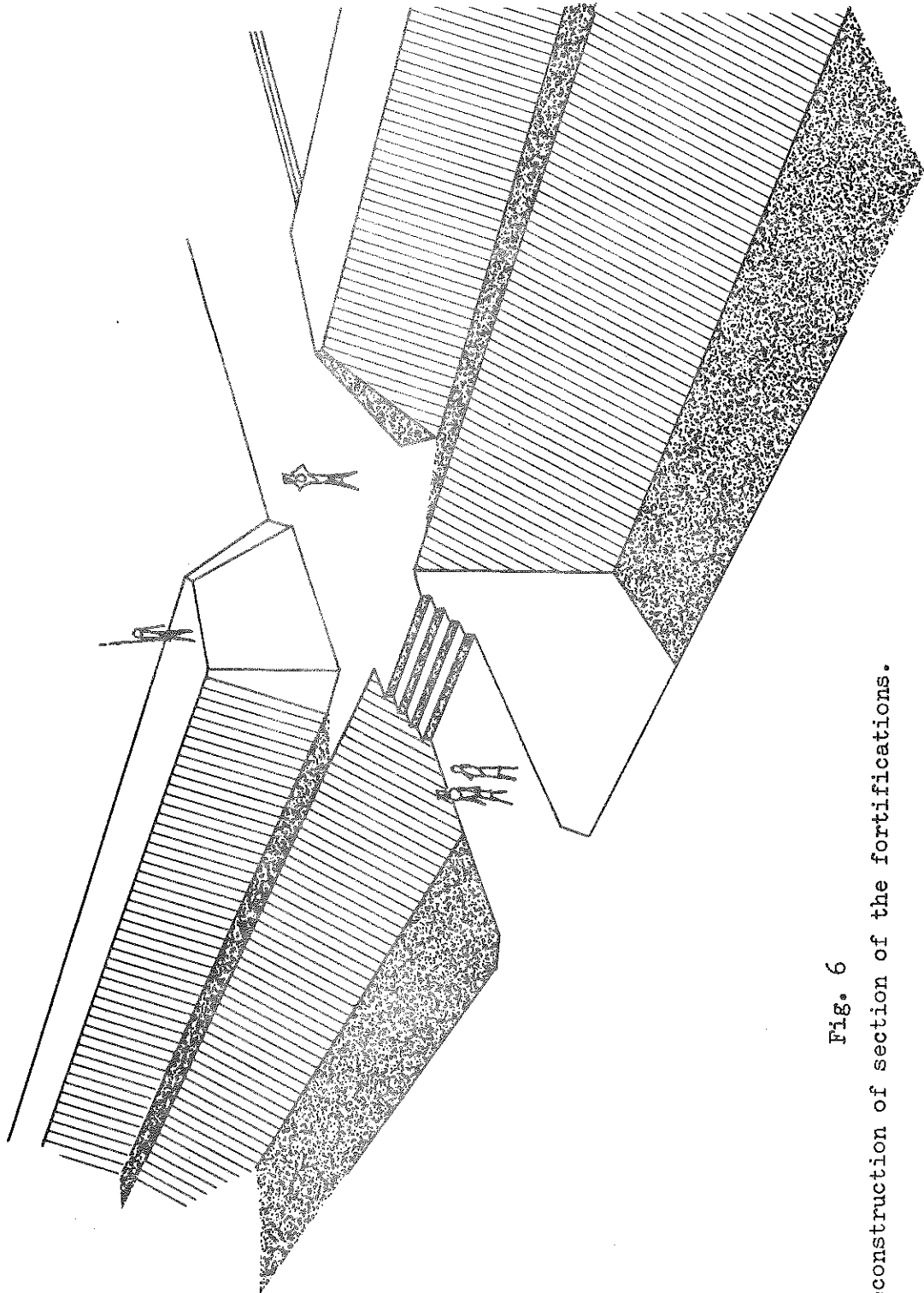


Fig. 6  
Reconstruction of section of the fortifications.

Fig. 7

	<u>Area</u>	<u>Perimeter</u>	<u>Mass</u>	<u>Critical width</u>	<u>Critical depth</u>
Tulum (Great Wall)	.067 km <sup>2</sup>	.74 km	12,560 m <sup>3</sup>	6 m	3-5 m
Mayapán	4.2 km <sup>2</sup>	9.1 km	60,000 m <sup>3</sup>	2.5 m	1.5-2.5 m
Tikal *	--	9.5 km	126, 350 m <sup>3</sup>	12 m	6.2 m
Becan	.19 km <sup>2</sup>	1.9 km	117, 607 m <sup>3</sup>	30 m	11.6 m

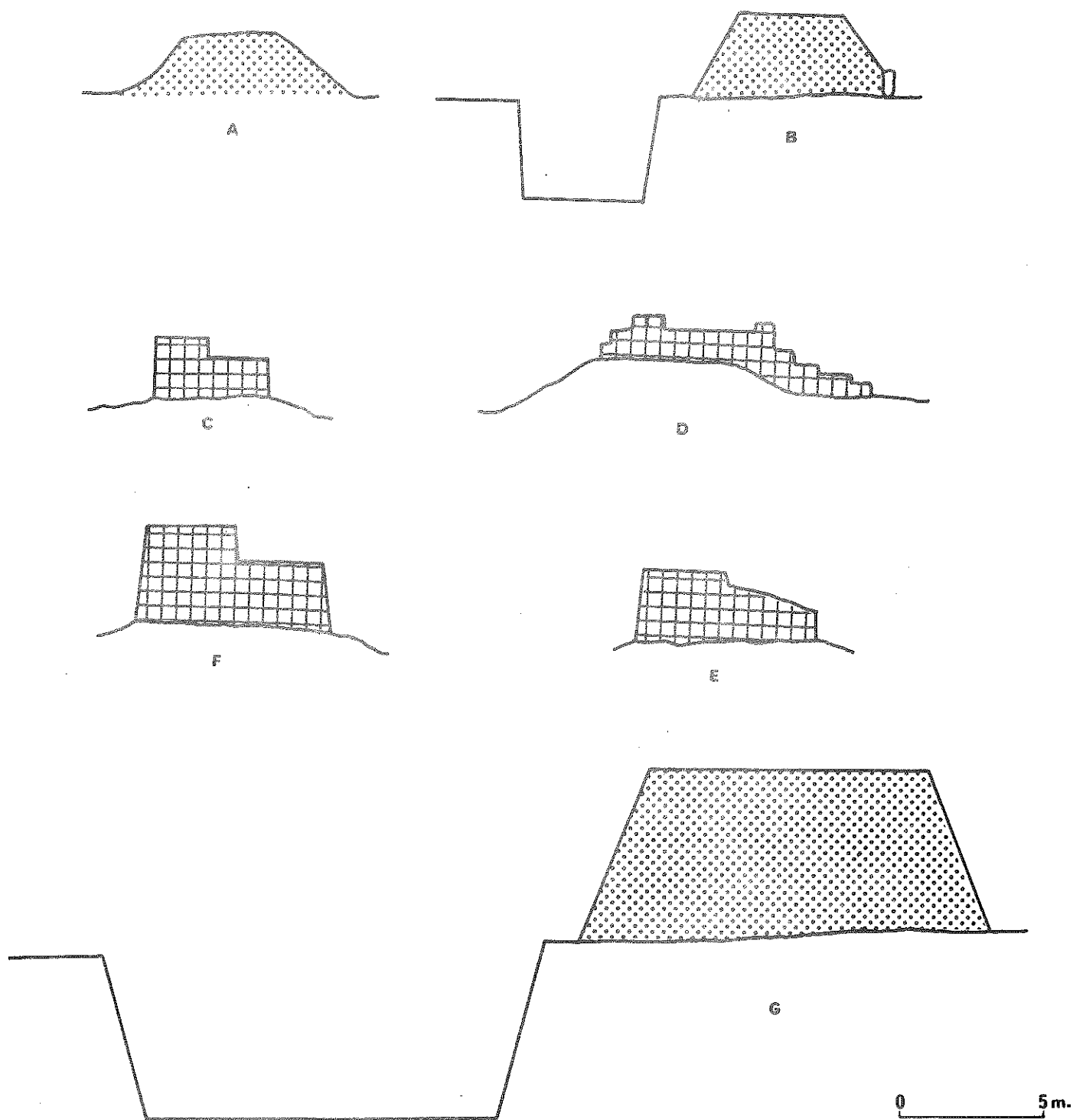


Fig. 8

Comparative cross-sections of various Maya fortifications.

A) Aguacatal (after Matheny, 1970); B) Tikal (my reconstruction after Puleston and Calender, 1967); C) Mayapan (after Shook, 1952); D) Chacchob (after Pollock and Stromsvik, 1953); E) Tulum (Great Wall only - after Lothrop, 1924:70); F) Xelha (Ibid. p. 134) G) Becan - reconstruction based on averaged measurements taken during the 1970 season.



Stone



Fill

## BIBLIOGRAPHY

- Armillas, Pedro  
1951 Mesoamerican fortifications. Antiquity, vol. 25.
- Ball, Joseph  
1972 A regional ceramic sequence for the Rio Bec area. Paper presented at the 1972 meetings of the Society for American Archaeology.
- Chang, Kwang-Chih  
1968 The Archaeology of Ancient China. Yale University Press, New Haven.
- Diaz, Bernal  
1963 The Conquest of New Spain. Penguin Books, Inc., Baltimore.
- Erasmus, Charles  
1965 Monument building: some field experiments. Southwestern Journal of Anthropology, 21:277-301.
- Larson, Lewis  
1972 Functional consideration of warfare in the southeast during the Mississippian period. American Antiquity, 37:3:384-392.
- Lothrop, Samuel  
1924 Tulum: an archaeological study of the east coast of Yucatan. Carnegie Institution of Washington Pub. 335.
- Matheny, Raymond  
1970 The ceramics of Aguacatal, Campeche, Mexico. Papers of the New World Archaeological Foundation 27.
- Pendergast, David  
1971 Evidence of early Teotihuacan-Lowland Maya contact at Altun Ha. American Antiquity 34:4:455-460.
- Piggott, Stuart  
1965 Ancient Europe. Aldine, Chicago.
- Pollock, Harry  
1965 Architecture of the Maya Lowlands. Handbook of Middle American Indians 2:378-440.
- Pollock, Harry, and Stromsvik, G.  
1953 Chacchob, Yucatan. Carnegie Institution of Washington Current Report 6.
- Proskouriakoff, Tatiana  
1961 The lords of the Maya realm. Expedition 4:1:14-20.  
1964 Historical data in the inscriptions of Yaxchilan. Estudios de Cultura Maya 4.

- Proskouriakoff, Tatiana (cont.)  
 1965 Sculpture and major arts of the Maya Lowlands. Handbook of Middle American Indians 2:469-498.
- Puleston, Dennis E. and Callender, Donald W. Jr.  
 1967 Defensive earthworks at Tikal. Expedition 9:3:40-48.
- Robertson, Donald  
 1968 Precolombian architecture. Studio Vista Ltd., London.
- Rovner, Irwin  
 1972 Implications of the lithic analysis at Becan. Paper presented at the 1972 meetings of the Society for American Archaeology.
- Ruppert, Karl, and Denison, John  
 1943 Archaeological reconnaissance in Campeche, Quintana Roo, and Peten. Carnegie Institution of Washington Current Report 2.
- Thompson, J. E. S.  
 1954 The rise and fall of Maya civilization. University of Oklahoma Press, Norman.
- Tozzer, A.  
 1941 Landa's relacion de las cosas de Yucatan. Papers of the Peabody Museum 18.
- Webster, David  
 1972 The Fortifications of Becan, Campeche, Mexico. Ph.D. dissertation, University of Minnesota, University Microfilms, Ann Arbor.
- Wolf, Eric  
 1959 Sons of the Shaking Earth. University of Chicago Press, Chicago.



## Campeche, Mexico

Fig. 2

