PIEDRAS NEGRAS PRELIMINARY PAPERS.

NUMBER ~~III~~ 3

PALACE STRUCTURES J-2 AND J-6

With Notes on Structure J-6-2nd,
and other Buried Structures in Court 1.

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- Preliminary Note -

The report which follows was originally prepared, and the plates were printed, after the 1932 season. At the time the two principal units under discussion had been only partially excavated, and this fact was naturally reflected in the text, and in the plates. Excavation of the two palaces was completed in 1933, and deep trenching and tunneling then taught us much about the prior history of the court on which they stand.

Rather than scrap the plates and further delay the appearance of what is only a preliminary report of limited circulation anyway, we have used them, and have tried to bring the text up to date by considerable interpolation, and by footnotes. As a result there are inevitably some passages in the text which lack proper illustration in the plates. We hope that nothing will be actually unintelligible.

In particular we should point out that the plans and sections, though drawn from careful measurements, in most places are based on the assumption that intended right angles really are such, and that intended straight lines are straight lines. Nowhere at Piedras Negras does such assumption agree with the facts. If there are any true right angles in the buildings of the city (we have found one or two) they are probably the result of chance. Since complete excavation, both buildings have been redrawn, and the major deviations from what was obviously in the architects mind have been recorded. These deviations were not great enough to affect the general appearance of the building, but suffice to show that the masons were quite careless, or, ~~more likely~~, that the architects were not able to, or at least did not, lay out an exactly rectangular plan.

A plan, in which angles as well as linear measurements are carefully recorded is, we believe, thoroughly worth while, once buildings are cleared to floor level. Apart from showing the degree of care, or of knowledge of draughtsmanship of the builders, they may, on occasion, by special distortions indicate the cause and manner of collapse, and also the inclusion of older walls in a new building.

Apart from this sort of inaccuracy, our plans are reliable, but they omit some things learned since. AAreader who wants to complete them may do so as follows:

Plate 1: Extend the outer wall of Room 6 so that it runs 2.05 m southeast from the outer doorway of this room. Here it ends, the southeasterly portion of the wall resting against the formerly exposed end of the original palace (which consisted of Rooms 1 to 4.)

Extend the southwesterly wall of Room 5 southeast until it meets the outer or front wall (not shown at all on the plate) at a point 1.40 m from its beginning as shown on the plate; the front wall which it here meets is 1.40 m thick, and extends northeast to a doorway 1.65 wide. The end of this wall forms one jamb of the doorway, the end of the original palace forming the other jamb. The reason for the extraordinary thickness of this wall is the fact that it includes within itself the remains of a heavy pier of an earlier period.

Plate 2 Make the front wall of Room 3 90 cms thick and extend it to a doorjamb 4.00 m from the northeasterly end of the room (we guessed only 3.40). From here, moving in a southwesterly direction, insert a doorway 1.70 wide, then a pier 1.25 m wide, then a second doorway 1.75 wide and a second pier 1.20 wide, the piers being 90 cms thick, like the wall. Extend the partition wall between rooms 2 and 3 clear to the front facade, which gives the other jamb of the last mentioned doorway, which is 1.65 wide.

Piers in Room 2 had completely fallen, but there is just room enough to place two piers and three doorways in it, of the same approximate widths as in Room 3.

Starting at the face of the vertical retaining wall in Structure J-6-2nd (shown in diagonal cross-hatching in the plate) and from there extend front and rear walls of J-6-2nd about 2.00 m to the southwest, to meet the original end wall of the chamber, which must also be added.

To correct several wrong guesses indicated by broken lines on the plan,

extend the northeasterly side of the transverse wall between Rooms 2 and 3 into the hearting, that is, across the end of the rear wall of Room 3, which was built against it. But bind this transverse wall to the rear wall of Room 2. Also, set the rear wall of Room 3 thirty centimeters behind the position assigned to it in the plan. These corrections all reflect information not at hand when the plate was made, but are important since they prove that Rooms 2 and 3 were not built at the same time.

Also indicate a break and change in type of masonry of the rear wall of Room 1, about 1.50 m northeast of the niche containing Throne 1. Indicate the stump of a partition wall 45 cms thick, which was inserted in the rear wall immediately behind the thicker and later partition wall between Rooms 1 and 2, which is correctly shown. These two items are important because they prove beyond reasonable doubt that Room 1 was built after the partial demolition of an earlier structure--the same against which the end of ~~which~~ Room 3 was placed.

The above notes cover everything we would now add to the plans of the two buildings themselves, and we would now show, subject to corrections indicated, practically all broken-hatched ~~hatched~~ portions as solid black. Further, excavation of the areas shown in stipple on the plans, revealed no additional interior fittings, which are entirely confined to Room 1 of Str. J-6.

Extend the side slopes of the niche in Room 1 (Plate 5, Section E-F) to a height 41 cms below the cap stones of the room and then join them by a horizontal line; ~~the~~ in Section A-B extend the rear soffit slope of this niche to the same height and ~~draw~~ draw a horizontal line forward to meet the soffit slope of the main vault. The reasons for this reconstruction are explained under the heading "Throne 1 - Description".

ACROPOLIS PALACES: INTRODUCTORY REMARKS

There are on the Acropolis at Piedras Negras twelve buildings which we have called palaces. Several involve more than one structural unit. The term "palace" as used here has no functional significance whatever. It is retained for want of a better one, and because of all the known buildings at the site, these appear to be the ones which should be compared with buildings at other cities to which that term has been applied.

Of the total number, seven Acropolis palaces, Structures J-2, J-9, J-11, J-13, J-18, J-21, and J-23, show a design based on two long parallel masonry-vaulted galleries, the vaults supported by two outer walls or rows of piers and by a common medial wall. In all palaces of this type there is a room at either end, (if both ends stand free) the long axis and the vault of which run transversely to those of the galleries. Structure J-12 has the same ground plan, and is therefore included under the heading "palace", though its roof was (at least supported on) perishable materials, (if it was not of thatch.) All buildings of this plan, which we call Plan-Type 1, stand entirely free, excepting Structures J-2, J-13, and J-21, which merge into high platforms at one end; and (of these) Structure J-2 was originally entirely free.

The remaining four Acropolis palaces, Structures J-6, J-8, J-10 and J-22, consist of single vaulted galleries, without end rooms. In each case the vault was supported by a free standing wall or line of piers at the front, and by a rear wall built against the hillside (or against older structures, which) and acting as a retaining wall for fill behind. Room 6 of Structure J-2 was also of this structural type. Because of this circumstance we shall occasionally refer to these buildings as "built-on" structures. Two of these (Structures J-8 and J-22) turn right angles, apparently adapting themselves directly or indirectly to the terrain. The roofs (surfaces) of all four appear to have been (nearly) flat and to have acted as terraces or promenades in front of other and higher Plan-Type 1 buildings to the rear. This variety we call Plan-Type 2 and it seems to be an adaptation of Plan-Type 1, or of a supposedly earlier type, for use on steep slopes.

The long galleries of most palaces of both Plan-Types are divided into

"rooms" to some extent by the addition of transverse partition walls. Some of these partition walls are obviously secondary, the results of remodeling, and ~~all~~ many may be so.

The arrangement of these buildings about Courts 1, 2 and 3, which lie at different levels on the Acropolis, and the major features of their ground plans may be seen on the partially completed plan of the city issued with the first of these Preliminary Papers.[1] The plan of Structure J-2, described below,

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1 Piedras Negras Preliminary Papers, No. 1, Philadelphia, 1933

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is probably the least typical of the Plan-Type 2 group as a whole, and is first presented merely because it is the only full-sized one of the double-ranged type which we have excavated completely. Before general conclusions are drawn, it should be compared with the plans of the other Acropolis palaces on the map of the city. In particular it is the only one with a transverse end room which apparently was not at least originally connected with the main galleries.

So far as surface conditions indicate, Structure J-6, also described below, does not differ materially from the other three single-gallery buildings (Type 2) except that it is the longest, and was provided with an unusually large and in part megalithic stairway. There seems no reason to suppose that the two Plan-Types of palaces--that is, single and double-ranged--differed greatly in function. The single-range palace, Plan-Type 2, is found on the Acropolis only where in all probability there was no room for a double-ranged building, because of the sharply rising bedrock of the hill. The use of the roof as a promenade (if our inferance on this point is correct) would appear to be a more adaptation, once the placing of such a building had been decided upon. At any rate, buildings of this structural class are not to be thought of structurally as mere chambers placed within terraces. Had the builders desired them to stand entirely free, they would have needed only to thicken the rear and in some cases the end walls, and to complete

the rear and end upper ~~zones~~ facades.[2]

Most of the Acropolis palaces (of both types) are standing at one point or another to heights above the spring of the vault. The bulk of our information is based on surface observations and measurements, which suffices to indicate the major features of ground plan and structure with certainty, but as to arrangements at floor level we know little. In most of (these) ~~this class of~~ buildings our excavations to date consist of mere trenching for cross-sections. Structures J-23 ~~and Structure J-2, which is full-sized,~~ classed[2] as a palace on the basis of its plan, though an extremely small one (and Structure J-2, which is full-sized,) have been completely cleared, and were entirely devoid of benches, altars or other interior structures of imperishable materials. Partial clearing (in) Structure J-12, a typical palace on the basis of plan, but roofed (at least in part) with perishable materials, showed the presence of at least one small bench placed against the medial wall. Structure J-6, ~~also~~ completely cleared, was found to have a small L-shaped bench besides other more unusual interior features described below, but these are all in one of its three rooms.

2 In the Southeast Section this plan-type occurs in free-standing buildings, but without the vaulted roof, in two known examples, Strs. S-17 and S-18.

STRUCTURE J-12

- Position and General Description -

The position of this double-range vault-roofed palace is best seen on the general plan and sections of the city, above referred to. It stands at the southeasterly edge of Court 1 of the Acropolis, facing that court, which is only about 30 cms. below its floor, but also and more truly facing the West Group Plaza on the other side, (which we consider the front.) ~~We consider the latter side the front, for descriptive purposes.~~ The floor is about 9.75 m above the plaza, with which it is connected by a stairway ~~apparently~~ running the whole length of the building, and which is no less than 32 m wide. The steps are badly ruined, but clearing a strip from

top to bottom near the line of the single passage through the building, and another strip three doorways to the southwest, as well as at each side , left no doubt that we were dealing with a stairway and not with terraces at the points examined. The whole slope in front of the building was very even, leaving little doubt that we were dealing with one continuous bank of steps. The risers were in the neighborhood of 30 cms in height. The stairway rises 9.35 m, receding 14.30 m. horizontally in the process, and rose at an angle of about 32 degrees. The stones had shifted forward too much to make possible accurate measurements of risers and treads. There is some indication that one of the steps, about halfway up, was wider than the others, forming a terrace or "landing". If so, the actual angle of ascent was slightly greater. Almost certainly balustrades of about 90 cms. thickness flanked the steps on either side. Only the central portions of the upper steps of this stairway are indicated in the plan and sections, Plate 1.

The northeasterly end of the building stands free, though close to the corner of the high rectangular platform-terrace J-7. The corner of the J-2 substructure at this end was rounded on a radius of about 4 meters. With such a curve, there was no need for specially cut curved stones, and they were not used. There was no stairway at the end to give direct access to Room 4, (the end room). It was possible to enter Court 2 by a narrow promenade around the front and free end of the building. Also a small stairway gave access (apparently) to this court from Str. J-1. However, perhaps the main entrance to the court was through the only three doorways of the building itself which pierce both the medial and outer walls on the same transverse axis, giving a straight passage through (See Plan, Plate 1). These are also in direct line with the central doorway of the throne room of Structure J-6 across the court, behind which the throne, described later, was centered. These three doorways are placed to the northeast of the longitudinal centers of the galleries of the building itself, and of the stairway. In the original plan there was another series of three such doorways, one behind the other, on the other side of the center axis,

and this asymmetrical arrangement may be said to result from repair or rebuilding operations, or else from a change in the original plan.

For purposes of comparison with other palaces of the Acropolis, this one must be thought of as consisting only of the rooms numbered 1 to 4 on the plan, which were built first. However, it abuts directly on rooms numbered 5 and 6, which are later, the roofs of which were apparently continuous with the surface of the platform terrace J-5, and with the roof over Room 3.

The southwesterly wall of Room 3 (end wall of the original palace) supports not only a half-vault of that room, but a half-vault of Rooms 5 and 6, as shown in the section A-B, Plate 1. The addition was therefore thoroughly integrated with the original palace.

The structure when seen from the southeast occupies an extremely commanding and important position at the head of the great broad stairway rising from the West Group Plaza. It commands a view over the plaza well into the East and South Groups. It is flanked on its left (northeast) by the great pyramidal temple, Structure J-4, with its eight stelae and a monumental megalithic stairway at the base. On its right or south-west is another high pyramid, J-3, crowned by a peculiar, apparently open, platform, with four stelae at its base. In front on the plaza is the large inscribed rectangular stone table, Altar 2. The altar is approximately opposite the fourth doorway (counting from the right or southwesterly end) while the fifth doorway is the central one. It was about 13.5 m out from the stairway.

When seen from the northwest, from Court 2, the impression is reversed. It is then in a small secluded court, at court level. The stairways rising on the three other sides of this court serve structures whose floors are nearly as high as its roof level. The court is dominated by Structure J-6, with its megalithic stairway leading to its elaborately carved stone throne. Whether intentionally or not, Structure J-2 served not only to ornament the West Group Plaza, but to shut off Structure J-6 from view until it burst suddenly on the observer close at hand as he entered the court. There was plenty of effort to make Structure J-6 magnificent, but it was hidden from the city at large.

With Plate 1 at hand, a detailed description of the ground plan is superfluous. Most of the building was reduced to a mere mound. As at Palenque, the

galleries (Rooms 1 and 2) are more or less open porticoes, with thirteen nearly square piers. The doorways are wider than the piers between them, nine on the front, seven at the rear. The stippling on the plan indicated excavation not yet complete, but this has been remedied since the plate was made, and it is certain that the galleries in this palace were not subdivided by partition walls. Room 4, the northerly end room, was never connected with the galleries. All other known end-rooms on the Acropolis, thirteen in seven palaces, were originally connected with each gallery, usually by narrow doorways at the extreme ends of the rooms. The cul-de-sac labelled Room 3 is also unique on the Acropolis. And end doorway into Room 3, and a doorway between the galleries near their northeast ends had been carefully filled up, as shown by white hatching. The latter filled-up doorway is shown in Plate 2, B.

We are reasonably sure that arrangements for fastening the bottoms of curtains in the doorways, are absent in this building and in Str. J-6, Whether they occurred at the tops of doorways can never be known.

Room 5 could be entered only from the front (southeast) or from Room 6, which was also furnished with a doorway leading directly to Court 1. The remaining vaulting at the southeasterly end of Room 6 leads us to suspect that this will have to be subdivided by the addition of a tiny separate chamber at this end when excavation is completed.[3] The interior doorway between

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3 Subsequent excavations prove this surmise to have been correct in a sense--the Room 6 vault turns a right angle at the front end.

Rooms 5 and 6 is vaulted and still standing, but is not as high as the rooms. We have tried to show its design in the elevations shown in connection with Sections A-B and C-D in Plate 1 and by the photograph, Plate 2, C. We have a considerable number of narrower vaulted interior doorways in other Acropolis palaces, and possibly this may be sufficient ground for supposing that the doorways between the main galleries, especially the two flanking the central one, which are of about the same width as this, were spanned by vaults. The north-

easterly of these (doorways in the medial wall), as noted, was eventually walled up. The exterior doorways were doubtless spanned by wooden lintels, the almost universal practice for exterior doorways, unless stone lintels were used. No stones large enough for lintels were encountered in the debris, and we could hardly have failed to find some of them, no matter how badly broken, especially on the side toward Court 1.

The rear part of the vault of Room 3 was standing complete, though badly displaced and broken. A little of the vaulting remained in place at the southwesterly end of Room 2. From these vestiges we know that the vault of Room 3 ran transversely, at right angles to those of the galleries, and we may suppose that it turned a right angle at the front and became an integral part of the vault of Room 1.[4] There was sufficient in place to say with

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4 A vault thus turning a right angle is well preserved in Structure J-8.

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certainty that the ends of the vaults in Rooms 3 and 2 were sloping and not vertical. This is in conformity with the almost universal practice on the Acropolis palaces.

Although preserved to this considerable extent, the vault-stones here were so displaced that we cannot give the exact height of the vault-spring in Room 3. It was in the neighborhood of 2.50 m. We feel justified in deducing the vault-height as about ~~1.00 m.~~ 90 cms. In Rooms 5 and 6, lower portions of half-vaults are in perfect condition with much plaster in place. There is there only a suggestion of an ~~arch~~ off-set or shoulder at the vault-spring. Cap stones are ~~3.45~~ 3.40 m above the level of the floor in Room 3, ~~and this is probably approximately the height of the cap-stones throughout the palace~~ according to our calculations. The vault height in Room 6 is clearly 95 cms, the vault spring height 2.50 m.

The vaults of the main galleries of course ran longitudinally, those of Room 3 and 4 transversely. The vault of Room 5 ran longitudinally, that of Room 6 from front to rear, except that with little doubt at the front it turned a right angle to the left (northeast). The doorway connecting these two rooms is vaulted, as noted, but the cap-stones are only 65 cms. above the spring, because of the narrowness of the doorway as compared with the rooms. This

vaulting runs from front to rear. The joining together of these four ~~units~~ elements gives a rather complex vault-plan.

Floors and the lower parts of interior walls retain their smooth coat of finishing plaster, without signs of color. The whole building, inside and out, where not especially decorated, was with little doubt similarly finished in smooth plaster, the floors, at least, polished.

Near the angle formed by Room 6 and the rear wall of the palace proper, the exterior medial molding and about ~~60~~ 45 cms. of the upper zone of the palace were sufficiently in position to yield a reasonably accurate partial section, though the lower vertical wall bulges a little. This section is indicated in Section E-F, Plate 1, and at a larger scale in Plate 3,C. The molding is a two-member type consisting of an upper element rectangular in cross-section set over another element triangular in cross-section.

The maximum height of the roof at center was very close to 4.50 meters above the floor. The surface on the longitudinal axis, above Rooms 5 and 3, at this ~~level~~ height, is fairly level, though disturbed by vegetation. More important, it is fairly well covered with crushed lime stone, probably the remains of the concrete surface. There are no building blocks, loose or otherwise, on this surface, and it is probable that there was no roof-comb.

Set firmly in the steeply sloping upper zone was a thin slab projecting about 20 cms. (Plate 2,D and 3,C) and below it on the top of the molding were several coarse potsherds. The debris along the base of this rear wall ~~where excavated~~ was rich in potsherds, both clean and with stucco adhering, and in fragments of stucco ornament, many with the potsherds used in building them up still imbedded in the fragments. The former presence of elaborate stucco ornaments in high relief on the upper zone is plainly indicated.

The fragments included considerable numbers of spheroidal bodies, arranged in strings, which perhaps represented beads. One of the few fragments recovered at the front is a good likeness of a round ear-plug, 45 mms. in diameter. Since a beautifully modeled stucco heads have been recovered elsewhere

in the city, we have some indication, far short of proof, that the decoration here included human figures. The heads in question, found in the fills under Structure K-5, and K-5, and in roof-debris of Structure J-29, indicate that the art of stucco modeling at this site had kept pace with stone carving, and perhaps was not inferior to that of Palenque.

Perhaps potsherds were found by Maler on the roof combs of Yaxchilan, leading him to conclude that incense was burned on them,[5] but if so it seems just as probable that they resulted from the disintegration of ornamental stucco work. Mr. John S. Bolles, of the Carnegie Institution of Washington expedition to Calakmul in 1932, reports informally the presence of quantities of potsherds on the surface at the base of one of the pyramids there. Possibly their presence may be explained in the same way.

5 Teobert Maler: Researches in the Central Portion of the Usumicinta Valley, Peabody Museum Memoirs, Vol. 2, No. 2, p. 125, 1903.

A narrow step or plinth surrounds the building on the outside. This is, at the doorways, a mere continuation of the floor. On this building, it is quite irregular, the width varying between 5 and 20 cms. This plinth seems to be universal at Piedras Negras, and is common in many parts of the Mayan area.

At the rear, the plinth, where it passes before the doorways, forms a single step about 30 cms. in height from court to floor level, (Plate 3,A). At the extreme southwest, there is an additional and lower step, with a sloping plaster-covered slab-faced riser, running from in front of the doorway an undetermined distance toward Room 6 (Plate 2,A). This appears to have been buried under the court floor, though the latter may have been lower here.[6]

6 During the 1933 excavations this supposed step was found to be one side of an open slab-lined drain, running parallel to the rear to cover a distance of 9.50 m. to the doorway of Room 6. Here the water entered a covered drain which passed under this doorway, curves below the floor to pass under the doorway connecting rooms 5 and 6; it makes a reverse curve under the outer doorway of Room 6 in order to discharge on the terraces just to the southwest of the great stairway at the front. The covered drain varies between 20 and 30 cms. in width, and is about 50 cms. in height. It was roofed with slabs. It is nicely graded. It is definitely later than the palace proper (Rooms 1 to 4) and was

undoubtedly built when Rooms 5 and 5 were added, They would otherwise have completely blocked drainage at this end. At the other end of the palace, which was always open, there is no drain.

OBJECTS

Aside from potsherds and a heavy flat pottery fragment, (possibly of a tortilla griddle,)[7] from the stucco fragments, stucco debris, and a few polychrome sherds from under the floors,[7] no objects contemporary with the builders were encountered.

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7 In 1933 a fair collection of sherds was secured from the bed-rock below this building.

The sherds are in process of study, with those of the city in general, by Miss Mary Butler, of the 1932 staff.

In the back of Room 3 we found three complete Lacandone incense burners, the sherds of two others, smashed by falling roof stones, and the isolated face from a sixth. The three whole vessels, apparently disturbed, lay one before the other, almost touching, the rear one against the rear (end) wall of the chamber, near the northerly corner. The two to the front rested on a level flat slab which lay on about 20 cms. of debris. It was quite level and may have been intentionally placed as a rude altar for the censers. Only one of the vessels, however, was level on its base (Plate 3, B). They were covered with a soft limy stratum washed from the higher debris to the front which protected them from the ~~roof-slabs~~ vault-slabs which later fell above them.

The two crushed examples lay at about the same level, a half meter or so to the south. All had been coated with a thick white soft stucco-like material.

DETAILS OF CONSTRUCTION

- Miscellaneous Dimensions -

Front and rear galleries, spanned by vaults running longitudinally, were probably intended to be of equal width, but the front room is more or less consistently 5 cms. narrower than the rear. Measurements at floor level vary between 1.60 m. and 1.70 m. for the front, and 1.70 and 1.75 for the rear.

Thickness of the front walls and piers varies between 1.05 and 1.10 m; of the medial wall, between 90 and 95 cms; of the rear walls and piers, between 95 cms and 1.10 m. The vaults sprang, as stated before, at about 2.50 m. above the floor. The height of the capstones, that is the greatest height of the rooms, was as we have seen, ~~probably about 3.80 m.~~ calculated at 3.40 m for the galleries, observed at 3.45 for Rooms ~~5~~ and 6.

Room 4 is 2.10 m. wide, a considerable increase over the galleries. Its southwesterly side wall is 90 cms. thick, the opposite (outside) wall about 1.05 m thick. Room 3 is 1.60 m. wide, conforming closely to Room 1 of which it is really a continuation at a right angle. The southwesterly ~~side~~ end wall, an outside wall originally, is 1.00 m. thick, the opposite and inner wall 75 cms. thick. The vault, in place at the rear but badly broken, an unusual combination, seemed to spring at about 2.50 m. above the floor. The wall between Rooms 5 and 6 is thinner than any in the palace proper, being only 70 cms. thick, though it supported half-vaults on either side. The outer or front (northeasterly) wall of Room 6 is only 50 cms. thick, as thin as any vault-supporting wall of the city. The length of the open portico which we call Room 1, including the width of Room 3, is 28.40 m; that of Room 2 is 26.54 m; Room 3 is 4.35 m. and Room 4, 4.50 m. in length. We now have information on Rooms 5 and 6, some of which is not reflected on the plan. Room 5 is 2.90 m. long and only 1.45 wide, due to the inclusion of an ancient pier in its front wall, which is therefore 1.40 thick. The dimensions of Room 6 as shown are 6.10 by 1.60 m. at the front end; ~~this~~ the width rises to 2.40, but the vault here runs in the direction of this measurement.

Outer doorways vary between 1.70 and 1.80 m. and 1.75 m. is obviously the figure aimed at. The only exceptions are Room 5, the outer doorway of which is 1.25 m. in width and the blocked-up doorway of Room 3, which was only 1.40 m. wide. The width of piers varies between 1.20 and 1.30 m. with 1.25 as a fair average. Inner doorways (including that between Rooms 5 and 6) are 1.25 m. wide except the central one in the medial wall between Rooms 1 and 2, which is 1.60 wide. Inner doorways are thus definitely narrower than outer ones, though all are of a fair width. The width of the piers between doorways in this building the outer

of Rooms 1 and 2 varies from 1.20 to 1.30 m. the intended width being about 1.25. The average dimensions of piers ~~was~~ were therefore 1.25 m. wide by 1.05 m. thick.

Most of these measurements are at floor level, where there has been no appreciable disturbance of walls. It is evident that the builders allowed themselves a departure of 5 cms. or so from dimensions probably called for by their plans. We should also state that the builders never achieved true right angles but merely approximated them. In this matter our plates are faulty, but will be corrected on final publication.

The lower supporting line of slabs of the two-member medial molding projects 32 cms. from the outer wall. It is 6 cms. thick. On it the lower member, triangular in cross-section, is built up of small very thin slabs laid in mortar and rising in tiny steps to the under side of the upper member. This step or "negative corbelled" effect was undoubtedly hidden under thick plaster. The angle of slope is something less than 45 degrees from horizontal. ~~This~~ The point of juncture with the upper member is 19 cms. above the under side of the large supporting slab, and when the whole was plastered over, the height or thickness of the lower member was about 20 cms. The point of juncture is about 15 cms. outside the plane of the main wall below the molding.

The upper member is built of two courses of superimposed slabs giving a total thickness of 10 cms; it was probably rectangular in cross-section, though it is too badly broken to show how far out it projected over the lower member. The whole molding is thus about 30 cms. thick. It meets the steeply sloping wall of the upper facade on a line about 20 cms. inside the plane of the main wall below. We describe this arrangement as an "inset" upper facade.

The slope of the upper facade as measured is 13.5 degrees from vertical. It was probably slightly steeper before the lower wall began to bulge slightly, ~~and the effect must have been more like the Yaxchilan than like the Palenque buildings.~~

We have no certain data on the total height of this upper zone. It was in place to a height of only 45 cms. above the molding. However, in the discussion of vaulting, we give our reasons for thinking that the vertical height of this zone, from the top of medial to top of upper moulding, was only about ~~1.35~~ 90 cms

In any case, the height of the upper zone was much less than that of the lower.

Walls, Piers and Vaults - MASONRY and Small details

Possible Changes in Plan

In this building it is easy to draw a distinction between walls and piers. This is evident on the plan, and is reflected in the masonry. The walls are built for the most part of roughly dressed blocks, tailing deeply into the interior, and of heavy slabs. They are essentially slab and mortar walls.[8] They are poorly selected from the point of view of uniform size. The medial wall appears to be poorer than the outer walls around the end rooms, some of the stones, except at doorways, not even having flat roughly parallel upper and lower surfaces. (See Plate 2, A and B). Despite this irregularity, there is very little chinking. Especially selected and roughly squared blocks are freely used at all observed doorway corners, both in medial and outer walls and in piers, (See Plate 2, A and B.)

Piers, were faced with for the most part of well selected medium-sized or large blocks, with parallel upper and lower sides, and some slabs, the stones used at the corners being roughly squared. Chinking with small slabs, sometimes several superimposed, is common in the piers. (See Plate 2, B, and Plate 3, A.) Piers, nevertheless, are essentially short sections of wall. The close proximity of the corners resulted in corner stones forming a large part of the total surfaces.

Vaults were constructed of relatively thin slabs, laid in mortar. Beveled edges were not observed, and indeed they are almost (though not quite) non-existent on other known buildings of the city. There was too little standing to say anything about beam sockets, vault-niches, ~~perforated capstones,~~ and other details of vault design and construction. Perforations in capstones follow were not noted.

The exposed stones of walls, vaults, and piers extend deeply into the interior. There is no hint of the veneering of other regions, which

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8 A photograph of a cross-section of the medial wall will be published in the final report, and can be had in the meantime on request. (Cat. No. 33-43)

can scale off and leave the wall structurally intact.

The selction and relatively careful dressing of blocks is coupled with spme binding, accomplished by alternating the directions of the long axis of the corner stones as the wall or pier is built up. Photographs illustrating pier masonry bear catalogue numbers 33-35 to 33-39 inclusive.

The medial wall is bound to the abutting transverse walls of Rooms 3 and 4 as shown by solid black on the plan, Plate 1. The southwest transverse end wall is bound to the front and rear walls as shown, and almost certainly to the northeasterly end wall, though we failed to not the fact. The inner transverse wal of Room 4 is shown as bound to the rear wall, but in fact was not. But there is no evidence that a plaster surface on the rear wall ran across the end of the transverse wall, as it does on the other end, and if this occurred it should have been apparent. The ruin at the front end of this transverse wall was too great to say whet er or not it was bound to the front wall, but presum bly it was not. The masonry of this wall (the rear wall of Room 4, but transverse to the building as a whole) was continuous throught its entire length, from front to rear walls of the main building. This proves definitely that there was never any connection between Room 4 and the galleries. It shows that the practice here was to erect the main front and rear walls ahead of this transverse wall, though perhaps they rose together, the outer walls a little ahead of the inner. It also suggest that both the outer walls and this transverse wall were in place before any plastering was done.

The transverse wall which separates Room 3 from the rear gallery (Room 2) is not only not bound to the main rear wall, as expected from conditions at the other end, but it abuts upon a smooth plaster finish on the inner face of the rear wall, which is intact behind the end of the transverse wall. This is what we looke for and failed to find at the other end. The transverse wall would therefore seem to be secondary to, and later than the main rear wall. But it is bound to the medial wall, the backbone of the whole building. At this end the evidence suggests that the transverse wall is contemporary with the medial wall and the original building.

can scale off and leave the wall intact.

The selection and relatively careful dressing of blocks for corners is coupled with some binding, accomplished by alternating the directions of the long axes of the corner stones as the wall or pier was built up. Photographs illustrating pier masonry bear catalogue numbers 33-35 to 33-39 inclusive.

The medial wall is bound into the abutting wall of Room 4, and the ~~northwesterly and southwesterly~~ walls of Room 3, ~~are bound together. That is, the end Room No. 4 was an~~ integral parts of the original plan and not later modification. We are not sure of the other wall jointures, except at the northerly corner of Room 3, discussed below.

The wall which separates Rooms 2 and 3 is not bound with the main rear wall, but abuts upon the inner plaster facing of the ~~latter~~, which is intact behind it, and it would, therefore, seem to be later. But it is bound into the main medial wall. The assumption from this would naturally be that this wall was erected at the same time as the medial wall. Further, if one remembers that this wall, which separates the rear of Room 3 from Room 2, carries balanced half-vaults on either side (Plate 1, Section A-B), it will be realized that the existing vaulting of both of these rooms was erected after this wall was in place, for one of those half vaults is ~~that~~ of Room 3. There is no break in the masonry of the supporting wall, which we are discussing, and no lintel, to indicate a mere walling up of a doorway. There is no question but that the vaulting of Room 3 was placed after the erection of the wall in question. Room 2 and its vault, therefore, could not have run directly into Room 3 and its existing vault, as Room 1 very probably did.

We must, therefore, conclude either that there was a general rebuilding of roofs and medial wall at this end, at which time the transverse wall was added, or that the passing of the plaster between Rooms 2 and 3 is not a certain criterion for determining really secondary features, and assume that no passage ever existed here. While the rear wall was certainly built and plastered before the transverse wall was built, the difference in time need not have been more than a few days. We have therefore adopted the latter conclusion, which as we shall see, is strongly confirmed in Structure I-6. That is, we consider the continuation of plaster along a wall against which another

wall abuts as evidence, but not as conclusive evidence, that the latter is truly secondary.

The question has another application in the same room of this building. Plaster is in position on the jambs of what we consider a blocked-up doorway in the southwesterly wall. Here we have it on two sides, in a central position, giving a doorway of reasonable width. But there is a catch here also. This wall is standing to the height of the vault spring, and supports remnants of the half-vaults on either side. Yet there is no lintel spanning the doorway. The vaults rest in part on the supposed secondary wall filling the doorway. We must conclude from this much more conclusive evidence that a doorway was built but abandoned due to change in plan before vault construction, that there was a lintel failure and its elimination during repair, or that there was in fact a tearing down and rebuilding of vaults at this end of the palace, during the course of which a stone or wooden lintel was removed and the doorway filled up and made a part of the rest of the wall. If the latter is what happened, then it is still possible that the plaster between Rooms 2 and 3 indicates a former connection between them. This criterion, if we could be sure of it, would be extremely useful, as the plaster passes behind practically every transverse partition wall and vault observed on the Acropolis.

To further confuse us is another circumstance. Incorporated in the wall separating the two most southerly doorways of the rear room (Room 2) is the perfectly clear stump of a pier, rising to a height of about 60 cms., which, without question, is either the maximum height it ever reached, or the height to which it was reduced when this wall was built. This can indicate either a change in plan after the pier was begun, (misreading of plan by the masons) or a tearing down and rebuilding.

The additional doorway indicated by this pier stump as part of the original plan, if not of the original building, would have been directly behind the southwesterly of the medial wall doorways, and have provided two more or less symmetrically placed passages clear through the building. But

there is no stump left of the other jamb of this doorway, the masonry being continuous for the whole wall, even at floor level, except for the stump of the pier or wall on either side of the doorway to be left in place, if anything at all was left, as is certainly the case. The floor is everywhere in excellent condition, and the complete collapse of the pier or wall forming the missing jamb is highly improbable.

It seems to us therefore that this pier stump most probably represents a change in plan during the course of construction, rather than the tearing down of completed walls and vaults. If this is so, the other two puzzling features at this end of the building can perhaps be best set down to the same cause, and our best guess is that originally it was planned to have Room 2 and its vault run directly into the transverse end Room 3 (as does the front gallery, Room 1); and also that there was to have been an end doorway as in Room 4; that at Room 3 the outer walls got to full height, but the vaulting had not been placed when the change was decided upon. At this hypothetical juncture, there remained only to turn a right angle to the rear with the supposedly as yet unfinished medial wall, and to block up the end doorway, to account for the observed facts.

— VAULTS, UPPER ZONE AND ROOF. —

The fallen condition of these features renders a precise description impossible, but we can arrive at highly probable approximations which should be of value when these buildings are studied as a whole.

In Room 6, a late addition to the palace proper, we know that the cap stones of the vault were 3.~~30~~ 45 m above the ~~floor~~ base of the outer wall, and that the vault spring (with a very slight off-set) was ~~2.43~~ 2.50 above ~~the floor~~ this level. This gives a vault-height (vertical distance between spring and cap-stone) of only 95 cms. The floor of this room is 12 cms. higher than that of the palace proper, but the outer wall goes down to the same level. The slope of the soffit of this vault was about 32½ degrees from the vertical.

Since this room is of about the same width as Rooms 1, 2, and 3, and the roof must have been continuous over all, ~~we may assume that~~ these figures

Probably are approximately correct for them also. If the vaults were regular, and all followed these measurements, the exposed surface of cap stones can be calculated as 15 cms. in width. in practice it probably varied considerably, with 15 cms as a minimum. In the wider Room 4, steeper soffit slopes, wider cap exposure, and possibly thinner roof-cap may have existed. In any case, rather flat low vaults seem to have characterized this building.

As has been stated, we know the approximate height of the roof, at the center, but we do not know it at the edge. The only building at Piedras Negras to which we can turn for assistance, is Structure P-7, probably very much later, and certainly a great deal wider. There we have fair, though not conclusive evidence. That the roof sloped down from the center at an angle of about 6½ degress. Using this figure and projecting the known slope of the upper zone, we would get 1.35 as the vertical height of the upper zone, measuring from the center to the top of the upper cornice. As to the thickness and form of the cornice, we have no knowledge. However, at Yaxchilan is a building (Structure 7) very similar to this in cross-section, being double-ranged, with almost identical spans, and also having a steeply sloping upper zone. There portions of the roof-concrete are in place both at the center and on the upper cornice, We measured this in 1934, and found the roof sloping down from center to the edge on a curve the cord of which slopes at an angle of 13½ degrees from horizontal. If we use this angle here, the upper zone height drops to 1.00 m; probably the true height lay between these extremes. In either case, it is perfectly certain that the upper zone was low in relation to the lower zone, Using the more gentle slope (though disregarding the probable curve in the roof-section) the roof thickness over the cap stones of the main galleries was about 70 cms.; using the steeper slope, this thickness was only about 50 cms. Again, the true figure was probably somewhere between these extremes.

-FLOORS-

Floors are of concrete, surfaced with plaster and white finishing plaster.

The concrete foundation, only about 5 cms. thick at the southwesterly end of Room 2, where it was observed carefully, is laid directly on pure broken rock fill. It contains river pebbles and crushed lime stone cemented together into a hard mass, broken only with great difficulty with a heavy crowbar. Picks were practically useless on it. On this is a 7 or 8 cm. layer of dark brown clay, fairly stiff, with occasional pebbles. Above is a layer of light brown clay of equal thickness, with occasional pebbles intermixed. To this was applied a coating of apparently pure lime, about 1 cm. in thickness, of a bright yellow color. On this was the final coat of white lime, apparently pure, which was about 3 cms thick. Concrete, clay and plaster layers are indicated in the section, Plate 3, D. The clay layers were absent at other points, and have not been observed in floors of other buildings.

The floor in the central doorway of the medial wall was so hard that an attempt to break through it was abandoned, the labor being too great for the probable reward. The floor in Room 4 was hard, but not excessively so, while that in Room 3 was quite soft by comparison, though only two meters or so distant from the excavation in Room 2. The floor in this room was never exposed to the weather. We must consider the possibility that water percolating through limy masses of debris for centuries and emerging under the concrete floor foundation into the comparative open of the pure rock fill may leave deposits of lime at this point, converting the original concrete into a harder concretion of largely natural origin. The stones of the fill are often a dead white color, due apparently to a secondary coating of lime. If the Mayans really constructed floors of the hardness encountered in Room 2, they equalled the best modern work in cement.

It should be noted that the plinth or step surrounding the building is really nothing but the low masonry wall forming the edge of the floor, from which the outer sides of walls and piers are set back. At the point examined, the floor, except for the finishing plaster, extends right under the medial wall (Plate 3, D)[9] Apparently the first step in constructing the building

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9 Subsequent excavations indicate a universal practice of first laying the complete floor--really a low platform--and then erecting the walls and piers on the floor

proper was to build up the fill to the required height, surrounding it with a retaining wall (the plinth) extending a little higher; and then to cover the fill with the concrete floor, making of the whole a level platform. The walls were then erected on the platform. Considered structurally, the plinth and floor are really a very low and final or final terrace, platform, and are an integral part of the substructure. However, architecturally the plinth is part of the building proper, and it is nearly always vertical, as here, and better made than terrace walls.

In this case the substructure, as seen from the front, is nothing but the front part of the fill forming the latest level of the whole of Court 1. The floor of the latter does not run under the floor of the building--the building floor and the court pavement are one continuous unit, though at different levels. It should be noted that the floor of Room 1 dips downward appreciably between the piers. This is common on single range buildings, but is not applied to the rear gallery of this building.

-Fills-

The foundation below floors was examined in the two end rooms and near the southwesterly end of Room 2, to a depth of about one meter. In the end rooms it was of pure broken rock, apparently of uniformly medium-sized stone. A section through Room 2 is shown in Plate 3, D, already referred to. The floor here rests on pure rock fill of small sized stones, which in turn rests on a deposit of much larger ones, the top of which slopes up fromfront to rear ~~that is, in the same direction as the slope of the hill on which the whole structure is presumably placed.~~ As to whether the use of two sizes, and this slope, observed at only one point, have any significance, we do not venture an opinion.

Additional work in 1933 taught us a good deal more about the foundations of this building.

At either end earlier battered wall terraces were incorporated into and form part of the hearting of substructure of J-2, though they were completely buried by the new construction. That at the left (northeast) is best known. It rose from a floor apparently

continuous with Structure J-1, to a height of 2.28 m., sloping back 90 cms. in 2.10, or about 24 degrees from the vertical. Remains of ~~rough~~ an uneven white plaster finish were present, and apparently the walls were plain. A subsidiary platform, 65 cms high, was placed on this with its front 1.20 m back from the edge of the main platform. This is also battered, though more steeply. Its nicely at a slope of about 15° from vertical. plastered finished surface is only 3 cms below the finished surface of the Str. J-2 floor. The level of the latter, and by implication, of the Court 1 floor, may thus be supposed to have been determined by the level of this older structure. The corner of the earlier structure is curved on an axis of about 1.10 m, (at the base) and is much sharper than the curve of the later platform which buried it. (radius 4 meters at the base).

A tunnel, 2.50 m in depth, was carried through the fill under the three doorways which give access to Court 1, and from the end of this tunnel a pit, just in the court, was dropped to bed rock. This established beyond question that Structure J-2 belongs to a period when the complexion of this court was entirely changed. The pit passes through an earlier floor measured as 3.78 m below the final court level. We were apparently passing through an earlier exposed pavement, not a building, though this is not certain. Bed rock was encountered at 5.38 m below the final Court 1 level, and dips sharply downward to the front. Buried terraces or stairways can therefore be predicted under the great stairway of Str. J-2, associated with this floor and with the two buried platforms which still rise, within the J-2 hearting, almost to its floor level on either side. The simplest interpretation of available information is that at least the rear portion of the great Stelae-bearing terrace J-1 is contemporary with these buried platforms. If the rear part is a single unit this conclusion cannot be escaped, since the left of the two buried platforms rests in that case on the J-1 floor. The front stelae-bearing part of J-1 must be either contemporary with or later than the rear part, and it is highly probable that trenching will definitely prove this buried complex to antedate the erection of the stelae, which run from 9.12.0.0.0 to 9.14.10.0.0 (stelae 1 to 8). Such proof will be no great achievement, since this buried

complex is almost certainly very much earlier than 9.12.0.0.0 for a variety of reasons which will be set forth when the buildings of the city can be discussed as a whole.

-Date- Cols

We cannot say much about the date of this building, except in a general way. We think it is one of the earlier vaulted palaces because it is next to the "heaviest" (See discussion "Building Periods"). If we are on the right track in using that criterion, the departures from the most typical palace plan do not help us. The more typical plan occurs not only in lighter, but in heavier and even in non-vaulted examples (Structures J-9 and J-12, respectively). It certainly was not one of the earliest buildings on the Acropolis, because it lies over an earlier complex. It almost certainly preceded Str. J-6 in its final form, quite apart from the relative weights of the two, because the throne in that structure, carrying a late date (9.17.15.0.0.) was placed on the line through the main passage through this, a scarcely fortuitous circumstance. To invert this interpretation would be to make the tail wag the dog.

Pottery sequence at Piedras Negras may help eventually. Altar 2, if it belongs to this building, may have been erected long after it, (and so is of little help.) According to Morley, this altar is the seventeenth hotun marker erected in the West Group, ending a series which runs back to 9.12.5.0.0 without a break. But they are associated with only four buildings. Probably each building is as early as the earliest monument before it, which here could mean only that Str. J-2 is as early as 9.16.0.0.0 the date of Altar 2. But this does not help much. So far as the writer knows, there is no evidence to suggest that a building is no earlier than the earliest monument before it, or even on it. Where a monument is incorporated in the building itself, by re-use as a building stone, by use as a lintel or wall panel, or where it appears to have been specially designed for use in the building in which it is found, perhaps contemporaniety may be inferred. Unfortunately nothing like this was found in Structure J-2. The monuments indicate a date before building activity ceased, the stratigraphy proves a date a good while after it began. This applies to the palace proper. Rooms 5 and 6 were later, how much we are not sure. We will discuss the relation of this building to nearby structures later on under the heading "Conclusions".

-STRUCTURE J-6-

-Position and General Description-

This is an example of ~~a palace of~~ the single range palace of Plan-Type 2, and of the structural class ~~consisting fundamentally of one continuous vault, in this case the longest known in the city~~ which we call for convenience "built-on". Its rear wall does not stand free. It consisted of three principal chambers placed end to end, which we have labeled Rooms 1, 2, and 3 on the Plan (Plate 4). Room 1 contains a connected small chamber, Room 1-a, elevated above the main floor. Room 1 and the surface of the monumental stairway in front of it were completely cleared in 1932, the remainder of the building in 1933. The floor is elevated 4.27 m. above the floor of Court 1. As in the case of J-2, the position of this building is best understood by reference to the general plan and sections of the city, in Paper No. 1 of this series. The central one of the five doorways of Room 1 is in line with the three doorways forming a straight passage through the longitudinal walls of Structure J-2, as atated, rather than on the center line of the stairway. The center of the doorway is about 75 cms. northeast of that line.

Room 3 extends to the northeast ~~behind~~ over the platform terrace, Structure J-7, the floor of which is nearly on its level, and merges at the end into the terraces of the pyramid J-4. This room was built later than some parts of Rooms 1 and 2, but probably before the latter were incorporated into Rooms 1 and 2 as found. At the other end, Room 1 merges into an older filled-up building, Structure J-6-2nd, a small part of which was left exposed. In visual effect, J-6 and what remains in view of J-6-2nd formed a continuous mass connecting, at this elevation, the pyramid to the north (J-4) and the terracing below the northeasterly end of the palace structure, J-8, which in turn merges with the pyramid to the south (J-3). Standing in the central doorway of Room 1 of the building under discussion, looking down the stairway and across Court 1, was the palace, J-2; on the left was the high terrace-like platform, Structure J-7, with its own broad stairway leading up from the court to its floor, a little below the observer's level. Beyond to the left towered the pyramid and temple, J-4. To the right, the same effect was repeated. A broad stairway rose from the court to the platform terrace J-5, a little higher than that opposite, and beyond to the right was the pyramid J-3.

There is little doubt that the roof of ~~the~~ Structure J-6 building was nearly flat and continuous with a terrace rising from the rear, as shown in the cross-section A-B in Plate 4. At the southwesterly end, remains of a stairway lead ~~won~~ down from the higher terrace at the rear to the level top of the fill over J-6-2nd, which was almost certainly continuous with, or but little higher than, the roof of J-6. (For the relation of terrace and building see Section A-B, Plate 2, in Paper No. 1 of this series). From below in the court, therefore, one looked up over Structure J-6 to a terrace of slightly greater length, which rose from behind it to the long facade of Structure J-9. The latter is a palace of Plan-Type 1, almost exactly parallel to Structure J-6, with three central doorways, the floor 10.70 m. above Court 1.

In one sense, therefore, the building being described seems to be subordinated to the general scheme of hill terracing. However, in effect, the fact that the ends do not stand free is largely negatived by the length of the building. The great stairway fronting Room 1 makes this part of the building very impressive when seen from the court below.

Rooms 2 and 3 were not excavated until 1933, and are ~~as shown~~ therefore stippled in the Plan, Plate 4. The debris here showed no hint of piers, though those of Room 1 projected above the surface before excavation.[10] ~~A great deal of the rear wall,~~ The 1933 digging disclosed two piers and three doorways in Room 3. An equal number of piers and ~~and the four corners of these two rooms, which are shown in broken lines in~~ doorways almost certainly made up the whole of the lower facade of Room 2, ~~Plate 4, were actually visible (See Plate 6, D and E).~~ We show them in but had completely fallen, along with the front edge of the floor.[10] ~~broken lines only because the surveyor's notes showing the locations of the~~ There were satisfactory remnants of vaulting only at the rear of the niche in Room 1, and ~~northeasterly corners of Room 3 did not agree with measurements, and were~~ at the northeasterly end of Room 3. ~~therefore in error. The plate is based on this first survey. This part of the plan presented is drawn from careful measurements, but without a check on the assumed straightness of the long rear wall or on true right angles.~~[10]

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10 A careful final plan has been since made for final publication. To complete the plan used here, follow directions in the Preliminary Note of this paper.

Room 1 has an L-shaped bench at the northeasterly ~~end~~, 40 cms. wide on the longer arm of the L, 50 cms. wide on the shorter portion, and 60 cms. high, placed as shown in the plan, Plate 4. At the other end of the room five equal steps rise at an angle of about 45 degrees to the floor of a small chamber, Room 1-a, raised 1.50 m. above the floor of the rest of the room. This chamber is partially cut off from Room 1 proper by the difference in height and by a pilaster against the rear wall rising from the chamber floor and the next lower step (Plate 7, B), and merging into the vault above. Possibly there was a corresponding pilaster on the ~~fallen~~ front side, found fallen at this level.

Part of the rear half of the vault ~~is~~ and the end wall were here in place and it is certain that the transverse end wall of the chamber was vertical well above the vault-spring, and was probably vertical clear to the cap-stones. (Plate 5, B) We have partially preserved vaults at corners in nine buildings in the city (all on the Acropolis except Structure P-7) and there is only one other example (mentioned below) among them where the end wall does not slope inward as it rises, in general conformity with the vaults on the side walls. The other example was a secondary affair, but this was the original end of the vault. However, it was hardly visible. The implication is that sloping ends were used for esthetic reasons, at least at this period.

This chamber, Room 1-a, was about ~~2.15~~ 2.54 m. high at the center (floor to cap-stones), ~~but~~ because its floor is only ~~65~~ 67 cms. below the vault-springs at the sides. Unless there were openings in the main front wall (here really one of the side walls of the chamber) it was dark and poorly ventilated. In both these very general features (darkness, low vault-spring) it resembles the central sanctuary of Structure P-7, which contained an altar, abses and ~~great~~ quantities of potsherds. However this chamber contained nothing, there was no evidence of fire, and there was no stone altar unless it was placed against the southeasterly wall (the front wall of the building as a whole), which had completely fallen to the chamber floor level (Plate 7,B). The chamber was built as an original and integral part of the building, as we shall show in a later section.

Behind the central of the five doorways of this room is a niche in the rear wall, apparently built to partially receive and set off a complex of four pieces of carved stone with supporting masonry, which we have called "Throne 1". Since niche and throne appear to form a unit, we describe both in a special section below.

We have no direct evidence on this building for the two-member medial molding as found in J-2, shown in Section A-B, Plate 4. It seems to be characteristic at the city, and occurs on several neighboring buildings, Structures J-2, J-8, J-9, and others. The vertical upper zone occurs on Structure J-9, cited purely hypothetically here.

Our reconstruction of the vault, shown in Section A-B, Plate 4, could be improved upon. The niche vaulting certainly rose higher, and is discussed in more detail below.

There was no part of the upper zone in place. Perhaps it should be shown as sloping. Structure J-9, immediately above and to the rear, has a portion of a vertical upper zone in place to a height of 50 cms. above the two-member medial molding so that a vertical upper zone appears to have been known at the city.

A plinth, really the edge of the floor, as on J-2, runs along the front of the building. It extends about 15 cms. beyond the outer sides of the piers and wall. In front of the doorways it forms a single step, about 30 cms. high, leading down to a broad step or promenade, 1.25 m. wide, which apparently ran in front of the whole building, until it merged with Structure J-7 at the left. As in the front room of Str. J-2, the floor slopes down slightly between the jambs of doorways.

From this a monumental stairway leads down to Court 1 (Plate 5, A). The five lower steps are "megalithic", a single line of large stones forming riser and tread of each step. These stones are badly weathered, but there is practically no doubt that they conform with other stairways of this type in having battered risers, and treads which slope up from front to rear. The stones are roughly squared, but of varying sizes. The long dimension runs

from front to rear. Sizes vary between 40 by 45 cms. and 90 by 100 cms. Thicknesses vary between 18 and 24 cms. Where a stone is not as long as the depth of the tread, the rear of the latter consists of fill. The treads of the two lowest steps are about 95 cms. wide, those of the next two ~~about~~ about 60 cms., the width of the fifth being about 80 cms. The width of this flight of megalithic steps is about 10 meters, and it rises to a projecting terrace about 1.50 m. high which forms wings extending about 3 m on either side. The corners of this terrace are not rounded, as on both levels of Str. J-2.

The front wall of the terrace is battered, but the side walls are vertical. From the rear of this terrace a steeper flight of four or possibly five fabricated stone steps leads to the narrow promenade fronting the building above. These upper steps were badly ruined. They seem to repeat on a small scale the shouldered effect of the lower flight, when seen in plan, but this was uncertain.

The stairway as a whole repeats the essential characteristics of a special type at this city, of which we have four, possibly five, other examples scattered through the South, East and West Groups. The essentials are a broad lowest flight, the steps formed by heavy cut stones, one course to a riser, and a terrace of no great height reached by this flight, the terrace projecting out from the structure served by the stairway, and also projecting on either side of the lowest flight, thus forming lateral shoulders. In the three cases carefully examined, the heavy stones are cut to form battered risers and sloping treads, as first observed by Dr. Mason in the stairway fronting Structure R-3, and on Structure J-1, where it is perfectly clear, and this is probably typical of all of these stairways. Despite weathering, in all cases it is fairly certain that we are not dealing with hieroglyphic stairways. In all except one case the structure to be reached is higher than the first terrace, and in all such cases, as here, the second flight is built up of small stones, and we have no evidence that their risers or treads were sloping. The apparent total of essential characteristics is therefore the projecting shoulder-forming low terrace reached by a broad flight of megalithic steps cut

to form risers which slope backward from the vertical, and treads which slope upward from the horizontal in the direction of ascent.

The whole building and stairway were without doubt plastered over. Finishing plaster on the buried floors of the rooms was in good condition without traces of color except one bright-red spot the size of a dime near the L-shaped bench in Room 1. This tends to show that, had the floor been painted, traces of the color would have been found everywhere. This is confirmed by the unusually good preservation of the orange-red paint on the broken pieces of the throne, which lay directly on the floor, some face-up, others face-down. Apparently floors at the city were not colored. The rough thick first coat of plaster was in place on buried portions of the inner walls at some points in Room 1, and on walls and vaults at the northeasterly end of Room 3 (Plate 6, D). Finishing plaster has not been found on walls of the city except close to the floor, as here, and where found it has been without color.

If the outer facade of the building was decorated with stucco relief, all traces ~~in the excavated area~~ had disappeared. There were no fragments, or potsherds which might have come from them, on the stairway. However, while the presence of sherds below the former position of a facade may indicate stucco decoration, their absence hardly proves the absence of stucco. Sticks and very small slabs of stone to the exclusion of sherds have been observed in stucco fragments at the city. We have also several small worked stones probably fashioned for reinforcing purposes. Unless found in actual fragments of stucco, these easily escape detection.

Two small fragments of modeled ornamental stucco were found, together with a smooth piece of painted stucco or plaster, in the debris above the bench in the niche of Throne 1. This showing is so poor that we believe they are not remains of interior stucco decoration in the niche, but probably had been included as fragments from another in the roof masonry, or the fill behind the rear vault.

-Throne 1- Description-

The evidence for our restoration and assembly in the Museum of this carved stone unit is given in detail below. The restoration is shown in the

frontispiece. Our basis for classifying it as a "throne" is the scene depicted on Lintel 3.[11] There the central figure sits on a throne the component

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11 The University Museum Bulletin, Vol. 3, No. 1, Frontispiece, Philadelphia, November, 1931.

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elements of which are, in essentials and in many details, identical with those found here. The throne was found under circumstances which left little doubt that it was forcibly torn down and broken up, whereupon Structure J-6 was abandoned. These circumstances will be related in more detail below. From an aesthetic point of view the destruction is regrettable, for the state of preservation of the recovered fragments is almost perfect; but the evidence of intentional destruction in ancient times is of considerable scientific interest.[12] Bright orange-red paint, in many places in good condition, still covers nearly all of the sculptured surfaces.

12. See J. Eric Thompson, Archeological Investigations in the Southern Cayo District of British Honduras, Pub. 301, Anthrop. Series Vol. XVII No. 3, Field Museum of Natural History, Chicago, 1931.

The throne cannot easily be disassociated from the building. It consists of a large flat seat or table, supported at the front by two slab-like tapering stone legs, their bottoms let into the floor. The rear rested on a depressed ledge at the front of a masonry bench, which completely filled a niche in the rear wall of the room. The principal surface of the bench was at the same level as the top of the seat, the supporting ledge being lowered by the thickness of the latter. Seat and bench were therefore in effect one continuous surface.

On the bench, at the rear, without doubt, centered behind the seat, was the elaborately carved slab which we are calling the "screen" for want of a better term. This was set on edge against the back wall of the niche, and formed a background for the priest or ruler who in all probability sat cross-legged on the seat during ceremonies.

The niche, somewhat wider than the throne, was roofed with ~~vaults~~ vaulted surfaces sloping toward the center from deep offsets at the sides, and sloping toward the front, over the throne, from the rear (Sections E-F and A-B, Plate 4, and Plate 7, B). This vaulting ~~we believe extended~~ is shown in the plate as extending to a flat "ceiling" at

forming the level of the spring of the main vault of the room.

This reconstruction is undoubtedly incorrect, as more careful observation in 1933 established the fact that the rear vaulting is still intact to a height of 82 cms. Since it begins 56 cms below the spring of the main vault (1.61 m above the floor) this means that it is still in place 26 cms above the main vault spring level. The slope of this rear vaulting was measured as 23 degrees and the slope from the ~~sites~~ sides toward the center of the niche was measured as 22½ degrees, beginning at the same level. There was no offset at the spring for the rear vaulting, but on the side the offset was the very unusual one of 20 cms.

The only reason which we can think of for this very deep offset at the sides is a desire to bring the side slopes close enough together to be bridged by a cap stone laid from one side soffit to the other, and this at a level sufficiently below that of the cap-stones of the main vault so that natural arch action would relieve the niche capestone of excessive load. Reconstructing the main vault at a soffit slope of 23 degrees, in agreement with that of the niche, and assuming a 30 cm cap-stone exposure, we get a main vault height of 1.87 m. Reconstructing the side soffits of the niche until their tops are 30 cms apart, the most likely cap-stone exposure at Piedras Negras, we reach a level 41 cms below the main vault cap-stones. At this point the niche arching could have been capped with one slab 35 cms or more wide, and of the usual length, allowing a 30 cm exposure from side to side. Forty-one cms (vertical measurement) of main rear vaulting would rest on this before the cap-stones of the main vault would be encountered.

This, we believe, is the most probable form of this niche vaulting. If we carry it any higher, it becomes pointed, as seen from the front, a form for which we have no evidence at this city. If we roof it much lower, we must either assume that the "ceiling" of the niche was formed by an offset or negative shoulder projecting no less than 35 cms. from the rear, or that wooden

beams ran from side to side. In the reconstruction shown in the plates this is what we did assume. But on that assumption there is no structural reason for the deep offsets at the sides, which, as we shall see, were a matter of especial concern. As soon as we discard the possibility of wooden beams, the deep side offsets become understandable and necessary.

To reconstruct the niche as here suggested, simply extend the side slopes as shown on plate 5, Section E-F, to a height 41 cms below the main cap-stones or ceiling of the room, and then join them by a horizontal line. On section A-B extend the slope of the rear of the niche to the same height and extend a horizontal line to meet the main vault slope. As we have stated, the throne looked directly out on Court 1 of the Acropolis through the central one of five doorways at the head of the monumental stairway, this doorway being directly in line with the three doorways piercing Structure J-2 on the opposite side of the court.

The front edge of the seat, so far as recovered, bears a single line of fourteen glyph-blocks, and on a basis of our restoration there was room for five more. The edges at the side were plain, if we may judge from a single fragment recovered, showing a perfectly smooth edge, 42 cms long. But the possibility remains that there were glyphs on the sides, extending only part way to the rear.

Both side and front faces of each leg bear glyphs, six glyph-blocks in single column to a side and ten in double column to a front face, or twenty-two on each leg. The principal inscription reads from left to right on the seat-edge, the observer facing the throne, thence to the left edge of the left leg; thence to the front, read in double column; thence down the right edge of the left leg; and from here to the right leg, which was read in the same order as the left. "Left" here is left of the observer, facing the monument.

The screen seems to be a large serpent mask, front view, with teeth and mouth curls at either side, two nose plugs in the center, and supraorbital plates above the eyes. If this interpretation is correct, the eyes are formed by two large squarish openings, cut clear through the stone except for the two nearly

live-sized human busts set within them. These face the center from either side. They were in large measure cut free from the stone and were silhouetted against the rear wall of the niche, though the faces were carved in low relief and not

faces were carved in low relief and not in the round. Hands and shoulders more nearly approach a full-round treatment. The face at the right of the observer is largely a plaster restoration, controlled by fragments ~~showing~~ including the eye and chin. Other minor plaster restorations appear clearly in the photograph. When in position, the supposed eyes of the mask were in effect shallow niches within the stone, about 34 cms. wide, 30 cms. high, and about 16 cms. deep.

Decorative elements at either side of the mask, possibly involving large serpent-scales, include vertical panels of four glyph-blocks each, and there is a horizontal panel of four additional glyph-blocks in the upper part of the mask at the center. All three panels are sunk below the general plane of the surface. The twelve glyph-blocks on the screen are carved in much lower relief than those of the seat, those in the left panel being little more than deeply incised. There is thus a total of seventy known glyph-blocks, with considerable probability that five or more are missing from the seat-edge.

The length of the screen is 1.86 m. at the top, 1.82 m. at the bottom; the height at the left is .59 m., at the right .61 m. The thickness varies from 14 to 16 cms. allowing for inequalities on the back, which was only roughly smoothed. Top and side edges were nicely tooled. On them are very clear remnants of smooth white plaster which have been broken off along a well-defined line a centimeter or two from the back, showing clearly where the plaster had formerly turned up against the rear wall of the niche. The bottom edge of the stone is quite rough, and devoid of plaster. This edge undoubtedly rested on the bench.

A sizable, roughly semi-circular section has been cut out of the bottom, just to the left of center. This is not a break, though it was crudely done. It must have been made before the screen was last placed in position, as there were traces of smooth white plaster along the bottom of the front face, showing where the plaster surface of the bench ~~met~~ turned up to meet the screen; and these traces followed the curve of this cut-out semi-circle. The plaster on this edge

of the screen was unfortunately removed in cleaning, but shows, though none too clearly, on field photographs.

A large part of the seat (principally the rear) was either thrown out on the stairway and exposed to the weather, or so broken up as to be unrecognizable. We have restored its width as equal to the bottom length of the screen, that is, 1.82 cms. though we might have chosen 1.86 cms. the screen length as measured at the top, or anything between. The depth (front to rear) as restored is 92 cms., a less certain dimension, but surely correct to within fifteen or twenty centimeters. The thickness at the edge is 13 cms., which increases a centimeter or so toward the ~~interior~~ center of the stone. The top was flat, plain, and nicely smoothed, so far as known, as was the edge of the single fragment of the side recovered. The bottom was only roughly worked.

A description of the left leg suffices for both, as they are practically identical in form and size. Viewed from the front, it tapers from a width of 29 cms. at the top to 21 cms. at floor level, which is indicated very plainly by white plaster broken off on a line just below the glyphs. The distance from the line of breakage of the plaster to the top is 52 cms., which corresponds within a centimeter to the height of the ledge which supported the bench top at the rear. The corresponding measurement on the right leg exactly equals the height of the ledge (53 cms.); adding the thickness of the seat we get 65 cms, which is the height of the bench behind the ledge. The leg continues to taper for about 13 cms. below floor level. This portion was let into the floor, and is very rough. The thickness of the leg is only 12 cms. so that it is essentially a slab, rather than a column or pier like the legs of the great table altars of the plazas. The backs of the legs are only roughly smoothed.

The niche, up to a height of about 1.60 m. was well preserved, and on the left was in position to about 2.20 m. above the floor. Below its vaulted roof it is a simple rectangular recess in the rear wall of the room, 2.40

m. wide and 50 cms. deep (See Plan, Plate 4). This was completely filled by the masonry bench, already referred to, the front of which was flush with the wall of the room. The bench, 65 chs. high, was badly disrupted at the center, but it was perfectly clear at the sides that the front edge had been lowered to form a ledge 15 cms. wide and 12 cms. below the main surface (Plate 7, E). This is the ledge previously referred to as having the same height as the effective height of the legs. Remnants of the plaster surface were in place at both ends of the rear part of the bench, establishing its full height of 65 cms. beyond question.

The plaster floor in front of the niche was badly broken but by skinning off the surface we were able to locate within reasonable limits the former position of the left leg. This we place in the center of a hole in the concrete base of the floor, which was filled with soft and darker material in which fragments of the white surface plaster were mixed to a depth of 10 to 20 cms. The hole was about 60 cms. in diameter, its center 60 cms. out from the bench and 60 cms. to the right of the left end of the niche, the observer facing the niche. The base of the right leg was found in a position corresponding to this point, on the right. It was partly imbedded in a similar broken area, though larger and less well-defined. It was still partly upright, twisted somewhat out of place, though the sculptured face still faced more or less to the front, and there was a large fragment of the seat-top against it. Probably it had not been entirely torn from the floor, and we may consider our location of the legs in the restoration as quite close to correct.

We have arbitrarily added 10 cms. for front over-hang of the seat, and the distance from the front edge, thus established, to the rear of the supporting ledge of the bench, 92 cms., is the depth of the seat-top as restored.

The photographs (Plates 6, C, and 7, B) show plainly that as originally constructed the ledge extended to either end of the bench. On the right side it is well preserved for a distance of 45 cms. from the end. This would seem to indicate that the seat was as wide as the niche. But this would mean

beyond the legs.

an overhang at the sides of about 45 cms. A scale drawing will demonstrate that an overhang of much less would still be out of reasonably probable proportion. Lacking proof, our best assumption is that the seat was of the same width as the screen, which gives a reasonable overhang, and, more important, agrees with the throne shown on Lintel 3.

Very probably when the throne was in place, the portions of the ledge extending beyond the bench, at the sides, were built up to the level of the rest of the shelf, though we have not done this in our restoration. This is confirmed to a slight degree by failure to find finishing plaster on the ledge.

The position of the screen on the shelf against the back wall of the niche is indicated by the scene on Lintel 3, and proved by the line of broken finishing plaster along the back of the top and side edges, and along the front face at the bottom.

Small bi-conical holes similar to those on Altar 2 were drilled through the edges of screen and seat. One is placed at the center of the screen, passing through the top edge and emerging in the border above the central glyph panel. There is another 33.5 cms. to the right, (observer facing screen) but none in the corresponding position to the left. Two more are at the extreme upper corners, both entering at the top edge that at the left emerging on the front, the other at the right edge of the stone but close to the front. Below each of these latter are additional perforations passing from the side edges to the face of the stone. That on the left is 32.5 cms., that on the right 36.5 cms. below the top.

Five similar perforations pierce the lower edge of the recovered portion of the seat. All lead from points between glyphs on the face to the bottom surface of the stone, passing behind the lower plain border. Counting from the left of the recovered glyph blocks, there are perforations after the third, fifth, seventh, ninth, and eleventh glyph blocks. We might expect another between the thirteenth and fourteenth blocks, but there is none there.

There are thus three known glyph-blocks on either side of the extreme left and right perforations, and possibly we should conclude that the third and central perforation was at the center of the seat. This is the informally expressed opinion of Dr. Morley. As restored, the center line of the seat

passes through the middle of the ninth known block, leaving room for a hypothetical additional block at the left and four at the right. The known glyphs are consistently 9.5 cms. in breadth, so that, even considering the seat as 1.86 cms. in width (the length of the screen at the top) we are limited to 19 glyph-blocks on the front. To give a symmetrical arrangement of both glyphs and perforations with the central hole at the center of the seat, we would restore only four instead of a possible five blocks, two at either end of the known series. If this were done, pendants might be hung from the perforations, without hiding the glyphs on the legs. But the holes on the top of the screen lack entire symmetry, and the fringe hung from the throne shown on Lintel 3 extends clear across the legs. In view of the close correspondence between that depiction and this actual throne, it seems probable that the large blank squares on the legs and seat-edge of the Lintel 3 Throne represent glyph-blocks, and that there was no objection to partially hiding them.

Because an unexpressed or missing calendar-round date 10 Chuen 19 Zip ~~probably~~ may have occurred between the calendar-round date on the seat and the first one on the left leg, and also because a secondary series connecting the 10 Chuen 19 Zip with the calendar-round date on the seat is missing or unexpressed, we have restored the maximum number of blocks, and placed four of them at the right and one at the left. To be logical, we should have restored all five supposed missing blocks at the right, to allow for 10 Chuen 19 Zip, plus a three-block secondary series to reach back to the 12 Manik 5 Zotz on the seat. But this is, of course, entirely hypothetical.

Possibly the perforations on the screen and seat served for attachments of skins and tassels. The screen shown on Lintel 3 is partly covered with a jaguar skin, and a tasseled fringe appears to hang from the lower edge of the seat.

The known glyphs on the edge of the seat are definitely in their correct order, as proved by the fractures of the stone; except that the fractured surfaces between the fourth and fifth glyph-blocks are scaled off so that the

fit is not perfect. But we consider doubt here as practically non-existent. There is nothing in the fragments to prevent interpreters of the text from adding or subtracting hypothetical blocks at either end of the series on the seat, within the limits indicated; or further from assuming that the band extended back four or five glyphs on either side. The glyphs on a fragment of another throne (according to tentative identification) do turn the corner (Miscellaneous Sculptured Stone No. 9--probable date 9.11.10.0.0 according to Morley)

Sizes of glyph-blocks seem to indicate considerable variation in the care with which they were laid out. Those on the seat edge are very consistently 9.5 cms. wide and 9.5 cms. high. Those in the upper central panel of the screen are 6 cms. high, the two end glyphs 9 cms. wide and the two central ones 8.5 cms. wide, perhaps an intentional symmetrical arrangement. The heights of the glyphs in the side panels of the screen are 4 cms. in each case, but the width of the left panel is 6 cms., that of the right only 5 cms.

Glyphs on the edges of the legs vary around 7 cms. in height, the widths on the two left edges being about 7.5 cms. but on the right sides 8.5 and 9 cms. (left and right legs respectively). The glyphs on the front faces of the legs vary from 8.5 cms. to 9.5 cms. in height, the widths from 12 cms. down to 9 cms. The last variation is of course mainly due to the tapering of the legs. The greatest care seems to have been taken where differences would be most easily detected--in the central panel of the screen and on the seat-edge.

Because of the good state of preservation of the vertical walls of the niche, it follows that any force of stones falling from the building onto the throne must have been directed almost straight downward, or rearward. This is especially true of the screen and the missing rear portion of the seat.

The four units of the throne were broken into 44 fragments of sufficient size to merit numbering and location in position, to say nothing of three or four dozen small chips, and the pieces of the seat not found, which comprised

much more than half of the whole seat. All but three of the recovered fragments were found scattered in confusion on the floor and in the doorway in front of the niche. Nearly all the major pieces were cleared, photographed and drawn in position before removal (Plate 7, D).

Fragment 5 is the lower portion of the nose of the mask, between the "eyes", and to get to the position in which it was found, it had to travel six meters horizontally, while dropping only about one meter from its original height.

Fragment 2 is the right end of the screen, weighing nearly 200 pounds, yet its center lay about 1 m. to the right of the right end of the niche and only about .60 m. out from the wall, and it must have described a curve around the corner of the niche to arrive at the position in which it was found, an unlikely condition in a natural collapse. Fragment 19, on the other side, is the base of the left leg, originally imbedded in the floor. It was found nearly 1.50 m. to the left of and behind the point where it was originally imbedded, while Fragment 10, the top half, was found 2 m. distant, directly in front of its original position. In a natural fall, the seat-top would have fallen on it and kept it, with other parts of the same stone, in approximately the same location, especially the imbeded lower part.

Part of the headdress of the right-hand bust, and a fragment which fits it, both from the screen, were found outside on the stairway, close to the top but over seven meters to the right of the center of the doorway before the throne (observer facing building). The head of the left figure was found on the stairway, two or three meters in front of the doorway. Such displacements as this cannot be accounted for even by the unpredictable action of roots, of which there was no sign in the limy light colored deposit on the floor.

Such instances of relative positions requiring human action for their explanation could be multiplied indefinitely. That the destruction occurred before (possibly immediately before) that of the building, is rendered practic-

ally certain by the fact that nearly all fragments (which covered a wide area) lay flat on the floor in immediate contact with the smooth plaster surface and therefore preceded the fall of debris from the building. They were immediately overlain by fallen vault-slabs from the roof, to a depth at the rear of about 1.60 m. and at the front of about 80 cms., effectually sealing them from any movement after the collapse of the roof. (See Plate 7, D). If the falling roof broke up the throne, many fragments, especially of the screen, would have been mingled with roof slabs, not uniformly under them, as was the case.

The front edge of the floor, in the doorway before the throne, was found sunken and broken, with fragment 5 of the throne lying in this depressed area below floor level. This destruction of the floor was not found elsewhere in Room 1, though ~~the front of Room 2 was so destroyed that there was no remaining evidence of its piers~~ throughout its length the substructure was buttressed by the stairway. The pier to the right of ~~Room 2~~ the central doorway, (facing the building) was so undermined that it had collapsed, the bottom courses, still in relative position, being tilted up at the rear (Plate 7, C). All other piers of Room 1, and those of Room 3 stood to heights of ~~about~~ .75 m. or more. These circumstances suggest the possibility that this pier was purposely made to collapse, though they fall far short of proof. Natural failure of the substructure at this point, behind the stairway, ~~is~~ seems unlikely. The failure in Room 2 is of course understandable.

With one exception, all recovered fragments of the seat are parts of the front edge, or fit such parts. A great deal more than one-half, including all of the back part, is missing. All the rest of the throne complex, except missing small fragments, was found. There appears to have been some selective process involved. These back pieces of the seat are precisely those which, of all others, could not have fallen outside the building in a natural collapse. If the aboriginal destroyers removed them or completely destroyed them, leaving nearly all the sculptured fragments in the building, the fact is noteworthy.

We do not believe we removed them unknowingly.

All debris removed from the throne room, between points 2 m. on either side of the niche, was carefully segregated between dry-walls of our own construction on the stairway. The lowest 30 cms. of this area in the room was removed with knife and trowel, every stone examined, and the earth eventually sifted. After we had recovered and assembled all the pieces, including many tiny fragments, from the building, and knew exactly what was missing, the debris from ~~it~~ this area, by then collected on the stairway, was removed by two picked men, who had been at work recovering the known pieces for two weeks, had been them assembled, and who had proved exceptionally sharp-eyed throughout. Had the missing pieces of the seat been thrown out by the pick-and-shovel work above the 30 cms. level, this second search should have yielded some of them. Many stones were submitted but none passed the test either for thickness, color of the stone, or smoothness of the top. A sharp lookout while excavating the rest of Room 1 also failed to turn up these missing pieces.

In conclusion we should state that all debris on the whole surface of the stairway, and from the court at its right side, was removed by workmen instructed to examine every stone, and three pieces from the screen (already mentioned) were found. If there remain any parts of the throne which have not completely weathered, they are probably buried in the angle between the stairway and the flanking terraces at the right (southwest) of the substructure, which is deeply buried by debris and has not been examined. ~~Needless to say, in excavating the rest of Room 2, we were on the look-out for other fragments, though without such exceptional precautions.~~

Throne I - Inscription and Comparisons

In a letter Dr. Morley reads the inscription[13] on the seat-edge and legs as follows:

Katun 15	
(9.15.18.16.7)	12 Manik 5 Zotz
(9.17.9.5.11	(10 Chuen 19 Zip)
1.0.10	
(9.17.10. 6. 1)	3 Imix 4 Zotz
3.(3)	
(9.17.10. 9. 4)	1 Kan 7 Yaxkin
4. 8.16	
(9.17.15. 0. 0)	5 Ahau 3 Muan
	End of a Hotun

Long-count numbers and 10 Chuen 19 Zip are not expressed on the monument, and the 3 kins of the secondary series 3.3 is eroded, as indicated by parentheses. It is the 10 Chuen 19 Zip and a secondary series connecting it with 12 Manik 19 Zip for which we have allowed four glyph-blocks, and should have allowed five, at the right in our reconstruction of the ~~throne~~ seat, assuming as we did that it was expressed. ~~We should have put all five possible missing blocks on this side, assuming as we did the former presence of this date and a secondary series involving a Katun.~~ The assumption is arbitrary, and without more pieces the proper position of this line of glyphs cannot be known with certainty. If we assume the inscription ran around to the side edges, as was true in a possibly similar case at Chinikiha (see later), and certain in a fragment probably from another throne at Piedras Negras (Throne 2), mentioned above, we have no basis whatever for determining the position of this group of glyphs, other than the holes.

Thompson has read the 12 Manik 5 Zotz of this inscription as a determinant of Katun 15, showing the vague or 365-day year 237 days ahead of the solar year, counting 24 leap-days to a century from 7.6.0.0.0 as the base.[14]

13 Large detail photographs of the glyphs have been made at the Museum and are available to epigraphists.

14 J. Eric Thompson: The Solar Year of the Mayas at Quirigua, Guatemala, Publication 315, Anthropological Series, Vol. 27, No. 4, pp. 373-4, Field Museum of Natural History, Chicago, 1932.

Between the Katun 15 and the calendar-round date 12 Manik 5 Zotz on the seat-edge is the composite glyph which Spinden believes denotes observation of the sun at the horizon,[15] and which Gates reads in a similar

15 Herbert J. Spinden: Maya Dates and What they Reveal, Science Bulletin, Vol. 4, No. 1, p. 105, Museum of the Brooklyn Institute of Arts and Sciences, Brooklyn, 1930.

manner as the sun entering between sky and earth.[16] It occurs twice again

16. William Gates: An Outline Dictionary of Maya Glyphs, p. 70, Maya Society Publication No. 1, Baltimore, 1931.

on the left and right legs of this throne, (each again before a calendar-round date) on Altar 2, Lintel 2, and on Stela 36. Perhaps it is worthy of note that in none of these cases has it a coefficient, as at Tikal, where it apparently means "kin"[17] and that in all it has a constant prefix.

17 Sylvanus G. Morley: Introduction to the Study of Maya Hieroglyphs, Bulletin 57, Bureau of American Ethnology, p. 72, Washington, 1915.

Another interesting glyph on this monument, considered by Spinden to be the sign for the equinox, is the kin-glyph, half-darkened by hatching. This occurs on the left edges of both legs, and also on Lintel 3.

When first discovered, it was thought that a carved piece of furniture of this particular sort was unique, but it seems not unlikely that adequate investigation in the Usumacinta region will bring more to light.

We have very good reason for suspecting that there is at least one other at Piedras Negras. The back or screen of the throne shown on Lintel 3 is similar to this one, but differs in details. Furthermore, the contemporaneous date of Lintel 3, according to Morley, was 9.16.10.0.0, twenty-five tuns prior to that of the throne under discussion. Lintel 8 (unpublished), though badly eroded, undoubtedly showed a wide seat or table with tapering legs. The lower figure on Stela 40 also ~~sits~~ rests on a table or seat supported by tapering legs.

There is now at the Peabody Museum, Cambridge, a small leg supposed to have come from this site, which may well belong to a throne of this type. It is illustrated by Maler who came upon it at Carmen.[18]

18 Teobert Maler: Researches in the Central Portion of the Usumacinta Valley, Peabody Museum Memoirs, Vol. 2, No. 1, pl. 64 and Pl. XI, Cambridge, 1901.

The dimensions of this leg, kindly supplied by Dr. Tozzer, are, as approximately translated into centimeters: height 47 cms; breadth 17 to 20 cms; thickness 15 cms. The height of the glyph panel is about 32 cms. The leg tapers slightly from top to bottom and suggests the possible existence of a throne smaller than Throne 1. It is entirely too small for a table altar of anything like the size of the five known examples at the city.

If ~~two~~ three assumptions with respect to Lintel 3 are granted, the approximate dimensions of the throne shown on it can be worked out. The assumptions are that the artist copied an existing throne; ~~as well as~~ that he copied it, the human figures with reasonable accuracy in the matter of proportions; and that the tallest figures, allowing for headdresses, were actually about five feet, four inches in stature.

On these assumptions, the top of the screen on Lintel 3 would be about 2m. above the floor--much too high to place it in the niche of Throne 1, the vault of which springs at 1.61 m. The exposed part of the leg of the throne of Lintel 3 would have had a height of about 50 cms.--too much for the leg at Cambridge, the total length of which is only 47 cms., of which about 14.5 cms. is plain. Most of the latter part was needed for insertion in the floor.

Possibly this is idle speculation, but the discrepancies are great enough to allow for a considerable error in estimating the height of the figures, and the sculptors of this period were certainly good ~~draftsman~~ draughts. If the proportions of the throne of Lintel 3 are not imaginary, we have a fair hint of the former existence of three thrones of this type at the city--Throne 1, the throne shown on Lintel 3, and a throne of which the Peabody leg is a part.

Partial confirmation comes from Miscellaneous Sculptured Fragment No. 9,

read by Morley as 11 Ahau 18 Chen (9.11.10.0.0) which seems to be the corner of and probably the whole end of another seat. If so, it was only 65 cms. from front to rear edges. The "sun at horizon" glyph, with the same prefix, also precedes the calendar round date here. We tentatively call this Throne 2, though its official designation remains Misc. Sculptured Stone 9.

Maler describes and pictures a stone seat at the not far distant ruin of Chinikiha, the inscribed edge of which appears very similar to that of the seat part of Throne 1. Further it "had rested against a wall" and was found in or about a structure which, though called a temple, seems to have been associated with "adjacent apartments" and may have been a palace.[19]

19 Maler, idem., p. 11 and Pl. II.

The most certain similar, though not an identical, construction was at Palenque. Immediately behind the central of the three principal and wide doorways on the westerly side of the palace structure, House E, is a sculptured oval stone plaque let into the medial wall and looking out onto the southeasterly court through the doorway. The plaque and location are well shown by Maudslay.[20] There are remains of a painted inscription on the wall

20 A. P. Maudslay: Biologia Centrali Americana, Archeology; Vol. 4 of Plates, Plates 3, 41, and 44, London, 1896-1899.

above it, remarked by Maudslay and by subsequent observers. On the basis of marks on the walls Stephens postulated the former presence of a seat below[21]

21 Incidents of Travel in Central America, Chiapas and Yucatan, p. 318, New York, 1867.

and this was drawn in place below the plaque, by Del Rio.[22] The latter

22 Description of the Ruins of an Ancient City, translated from the original Manuscript of Captain Don Antonio Del Rio by Doctor Paul Felix Cabrera, London, 1822.

shows what must be intended for hieroglyphs on the seat edge, and sculptured figures on the front faces of the legs. There was what seems to have been a

"sky band" at the back, below the plaque, possibly painted on the wall or perhaps on a low stone analagous to the screen of Throne 1. Stephens, judging from his drawing, thought there was a vertical member at the back of the seat. This is a fairly close correspondence in position and design with our Throne 1.

The figure at the center of the roof comb on Structure 33 at Yaxchilan is seated on a broad bench with tapering legs remarkably like the seat of our Throne 2.[23] There are thus strong hints that this type of monument was

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23 Maler, idem, Plate XLII

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known at the three principal Usumacinta sites and at one of the minor ones, and this without excavation to any great extent except at Piedras Negras, where we have hints of three, two of which could not have turned up without excavation.

-Structure J-6-2nd, and Other-

Buried Structures.—

Reference to the plan and to Sections E-F and C-D, in Plate 4, will show that Room 1-a of Structure J-6, and at least part of Room 1 at the southwest occupied the position of an older dismantled building, Structure J-6-2nd. The front and rear walls of this earlier building are shown in hatching descending to the left in the plan and to the right in the Section C-D. The front wall and the floor of J-6 is continuous with that of J-6-2nd. That is, the vertical part of the front wall of J-6-2nd was used as the front wall of the later building, but with a new and narrower vault, supported by it and by a new rear wall. The latter is about 80 cms. forward of the old rear wall of J-6-2nd.

In 1933 we followed J-6-2nd to its southwesterly end. The end, measured along the inside of the front wall, is 2.00 m. southwest of the face of the secondary retaining wall shown in diagonal cross-hatching in Plate 4. This end wall has a soffit slope above the vault-spring, like the rear. We also penetrated the rear wall of Room 1 of Str. J-6 and established the fact that the lowest courses of the J-6-2nd rear wall still extends to the northeast at least as far as a point behind the center of the right or southwesterly doorway of Room 1. This confirms our belief that the front wall, if not the piers, of Room 1, was originally erected as the front wall of J-6-2nd. It is further confirmed by our inability to detect with certainty any break in the masonry of that wall; and by a somewhat vague difference between the masonry of the pier next to this wall and that of the others, which makes a more liberal use of large thin slabs. Even this pier may have originally served J-6-2nd. (Compare Plate 7, A, with C of the same plate).

A necessary deduction from these facts is that the vaulting of J-6-2nd, found in place at the end, where the room is only 2.50 m. wide, continued over the portion to the left (northeast), which is 2.90 wide. The only alternative

is to suppose that over the wider part there was a series of transverse vaults, their bases on wooden beams as in the Mexican buildings at Chichen Itza, or on transverse partition walls of which there was no sign. Either of these assumptions is improbable in the highest degree.

We assume therefore that the vaulting of J-6-2nd was longitudinal in its entirety, but that at the end its span was less and the height of the cap-stones lower than the rest, which, unfortunately, was entirely removed by the Maya before erecting Room 1 of J-6, The juncture of two vaults, one lower and narrower than the other, end to end, offers less complicated technical problems than were solved in the vaulting of Rooms 5 and 6, with their low connecting doorway, in Structure J-2, as theoretical reconstructions of the vaults involved will show.

In any case, even the narrowest part of J-2-nd is 2.50 m. wide, and J-6 certainly followed a wider structure. There is every reason to suppose that it followed a structure with a common outer wall thickness of 75 cms., and a span of 2.90 m, except for its end, which was reduced to 2.50 in span, for some reason not very clear, but possibly connected with the hidden contours of bed rock.

Because positive evidence of the vaulting of the wider part of J-6-2nd is lacking, we might have placed question marks after the figures for J-6-2nd in the Summary Table at the end of this paper, which have for their basis the assumption that a longitudinal vault spanned the known width of 2.90 m. We believe asterisks, indicating a theoretically reconstructed vault, are all that are called for. have, nevertheless, every reason to suppose that assumption is correct, and

The front wall of the wider part is 75 cms. thick, as we have seen. For the narrower part, this increases to 1.15 m and very soon to 2.35 m without any break in the masonry, showing clearly that the thickening of the wall, the first stage of which narrowed the room, has nothing to do with structurally possible vault-span ratios. The spring of the vault is 2.00 m. above the floor, the reconstructed cap-stone heights (assuming 30 cms. of cap-stone exposure) being 3.75 m. for the narrower, ~~4.15 m~~ 4.10 m for the wider part, with

corresponding vault heights of 1.75 and 2.10 respectively.

This earlier building, Structure J-6-2nd, may possibly be part of another early building which was only partially dismantled. This cannot be known with certainty without further excavation, but it ~~probably~~ almost certainly was not, and we will here call the second early unit "Old Rooms 1 and 2". The floor of Room 1 is continuous with this also. The transverse partition wall between Rooms 2 and 3 is the northeasterly end wall of this earlier unit. Its rear wall at least up to the spring of the vault was left intact as the rear wall of Room 2. It still passes behind the transverse partition between Rooms 1 and 2, running (in a southwesterly direction) to a point at floor level which is about 1.50 short of reaching the niche of Throne 1. Here, on an irregular line sloping upward and to the northeast, the highly irregular character of the stone used changes to the more or less natural coursing characteristic of well selected slab walls, in which the upper and lower surfaces of the stone are parallel to each other. From here on slab masonry, clearly observable on the surface, without cross-section views, is used for the rest of the rear wall of Room 1, including the niche.

It is therefore clear that Room 1 made at least partial use of the front wall of Structure J-6-2nd, and of the rear wall of "Old Room 1", and its span was thus determined by a decision to use these old walls.

The rear vaulting of Room 1 is, however, continuous with that of Room 2, Since it is entirely fallen at the junction of the new and old parts of the rear wall, it is impossible from inspection to say whether Room 1 is merely an extension of Old Room 1, with its vaulting spliced to that of the later, after the removal of the old unit's southwesterly end wall, or whether an entirely new system of vaulting was erected over both Rooms 1 and 2. We will take this up shortly.

The other (northwesterly) end wall of Old Room 2, which was not torn down, runs behind the end of the rear wall of Room 3; and what appears to be a remnant of the ~~upper facade~~ medial cornice at this end also runs behind the rear half vault of Room 3. It is therefore clear that Room 3, both wall and vault, as well as Room 1 in its final form, is later than Old Rooms 1 and 2.

The reason for thinking part of the originally ~~exposed~~ outside medial molding of Old Room 2 is preserved in the end vaulting of the later Room 3 is that, contrary to known practice elsewhere, and at the other end of this same Room 3, the soffit does not slope out directly from the vault-spring. Instead it goes up straight, or with a slight negative slope, if anything, for about 30 cms. Above this all is in ruin. If the builders, erecting Room 3 against the formerly outside end of Old Room 2, desired to make this end roughly conform to the other with a minimum of labor, they might have trimmed down the now incongruous medial moulding. If its lower member was the usual apron variety, this would result in the form we find, to about the height we find. There is no other apparent reason for the difference in the lower part of the vaulting at the two ends. This form at the base of vaults has been observed by the writer at Yaxchilan, but not at Piedras Negras, and never in combination with the usual design in the same room.

As will appear later, it is of considerable theoretical importance to determine whether the vaulting of Old Room 2 was torn down and replaced when the final Room 1 and its throne were erected. The fact should be here noted that, if it was torn down, at a time subsequent to the erection of Room 3, we would expect care to be taken that the end vaulting of Room 3, including this remnant of the earlier cornice, was not disturbed. The removal of all the vaulting of Old Room 2 could easily be accomplished without disturbing this lower 30 cms of the original outer and end upper facade; and to disturb it meant the removal and rebuilding of the end vaulting of Room 3, for no apparent purpose. ~~which we know did not occur~~. It follows that the presence of this little remnant of the upper facade of Old Room 2 is proof that Room 3 is later; but no evidence that the vaulting itself (and therefore from wall or piers) of Old Room 2 persisted to the end.

We found part of a soffit slope rising from the inside of this northeasterly end wall of Old Room 2, tied to the rear vaulting on the rear wall of Old Room 2. Unfortunately this rear vaulting was entirely destroyed toward the middle of the room, so that it could not be followed to the portion at the other end, which runs without a break into Room 1. This again will not help in determining whether or not the original vaulting came down. If it did, we have every reason to suppose that it all came down, and a new end soffit would naturally be built and tied to the new rear soffit slope. There is therefore no evidence here precluding the possibility that the vaulting and the missing piers of Room 2 in its final form were not later than the rear wall.

We are now free to discuss some positive bits of evidence tending to show that the front wall or piers of Old Room 2, as well as Old Room 1, were removed and therefore the vaulting with them, to make way for a new set of piers and vault which ran the length of Rooms 1 and 2 in their final form. This may have occurred either in J-6-2nd times or Throne room times, more probably the latter. To facilitate discussion, which will be none too clear and certain, the interested reader should complete Plate 4 as suggested, and number the piers shown on the plate from left to right, remembering there were probably two piers of like dimensions in Room 2.

The rear wall of Old Rooms 1 and 2 runs southwest to a point a little beyond pier 4. From here on, the change following an irregular line rising from the floor to the northeast, the masonry is composed of longer and more regularly selected slabs, than are found in all other rear walls of this complex, or in any of the walls of Structure J-2. This extreme slab character agrees with the front wall of J-6-2nd (but not its rear wall and Structure J-2) and diagrees also with the front wall of Room 3, and the Room 3 piers. It agrees with piers 3 4 and 5; but appears to disagree slightly with piers 1 and 2. These are badly ruined and it is difficult to decide. Compare Plate 7, A with C.

It is obvious that piers 1,2 and 3, being opposite this later part of the rear wall of Room 1, which includes the Throne 1 niche and overlaps the old portion, are contemporary with it, or else, dating from an earlier time, were retained to support half of the latest vault. Because of the more precise agreement in masonry type of pier 3,

masonry type, with the final throne room rear wall

3, we are tempted to assign piers 1 and 2 to J-6-2nd, and pier 3 to Room 1 in its final form, that is to the throne room, but this distinction is uncertain.

Since the front wall of J-6-2nd, and piers 1, 2 and 3 are all opposite the new part of the throne room rear wall, it is certain as implied above that if any earlier vaulting was supported on these piers, it was torn down when the throne room was built.

Piers 4 and 5 are better preserved than any of the others, and exhibit the ~~slab~~ more regularly slab masonry type to a marked degree, in agreement with what is left of pier 3, and in disagreement with piers in Room 3 and in Structure J-2. Although they are opposite a rear wall dating from Old Rooms 1 and 2, they are therfore probably contemporary with pier 3, and therefore with the throne room period of construction, or possibly with J-6-2nd.

If there was any splicing of the new throne room vault to undisturbed vaulting of Old Room 2, it must have occurred over a wall of pier. Therefore, ~~it~~ if it occurred at all, it occured over one off the missing piers of Room 2 - that is, within Room 2 (unless pier 5 dates from J-6-2nd times and ...). It did not occur over pier 4 or 5 unless we are ~~entirely~~ misled by their ~~masonry~~ agreement in masonry type, ~~with~~ along with pier 3, with the masonry of the later part of the throne room rear wall. Also we know positively it did not occur over pier five, because the rear vaulting is in place opposite this pier, passing without a break above and across the partition running back from this pier. The evidence of masonry types thus leads to the conclsuion that ~~the~~ removal at one time or the other of old piers (or front walls) which extended in to Room 2, and is confirmed by the requirement that new vaulting (as well as old) should be continuous over the partition between Rooms 1 and 2.

We can get a little light on the problem from a different angle Reference to the plan shows that the final partition between Rooms 1 and 2

If pier 4 belongs to the J-6-2nd period the splicing may have occurred here in Room 1, ... this would mean that Old Room 2 remained unchanged, along with ... of Old Room 1, after a remodeling in J-6-2nd times; or else that it was an original integral part of J-6-2nd.

If we are wrong in distinguishing between pier masonry, ~~then this~~ the new throne room vaulting might have been spliced to pre-existing vaulting over pier 4, as it is opposite the old part of the rear wall. On this hypothesis, the splicing would be to older vaulting, but the latter would date from J-6-2nd times, all piers being considered contemporary with J-6-2nd. In this case, the Old Rooms 1 and 2 walls must be an integral and original part of J-6-2nd, or else all that was left of an earlier building dismanteled when J-6-2nd was built. The only way to avoid the conclusion that front wall or piers, and therefore the vault, of Old Rooms 1 and 2 were removed, either in J-6-2nd or in Throne Room times, is to make them an integral part of J-6-2nd as originally planned and built. So far as known parts of plans are concerned, this was possible.

Behind the rear end of the final partition wall between Rooms 1 and 2 is the stump of an earlier transverse partition wall. Its left or northeasterly side ~~is~~ ran on the same line as the same side of the final parttion, and both are in line with that side of pier 5. The early partition was only 45 cms thick. It now appears to have been inserted in the Old Rooms 1 and 2 rear wall. They both end against it, without binding, an unusual arrangement. The stones of the Old Room 1 wall are smaller than those of the Old Room 2 wall. If the partition projects forward from a buried ruin to the rear, these two walls may differ in age. Both are certainly latter than the partition, if they are not contemporary with it. The writer cannot work out any plausible reason for the presence of this stump except that it is contemporary with the walls on either side, and dates with them from an Old Rooms 1 and 2 period. In that case the difference in masonry between Old Rooms 1 and 2 must be assigned to contemporary use of two quarries, or some such reason. If the stump belongs to a buried earlier ruin, it is difficult to understand why it was not cut back to a point behind the rear walls which we find exposed, unless the partition remained in use after the erection of Old Rooms 1 and 2. In that case the differences in their masonry would entirely understandable. This would mean, hpwever, that although Old Room 2 might be later than Old Room 1, it was not erected as part of J-6-2nd, being cut off from it, at least for a time, by this early partition.

added
a certain/strength. The rear walls of Old Rooms 1 and 2 come up against either side of this old partition, and the three are thus ~~proved to~~ probably ~~be~~ contemporary. If this practice was followed at the rear, one would expect it to be followed at the front, which would require cetering behind the partition the pier.

The old partition could of course have been bound to the pier in the usual manner, by having stones from pier and wall overlap each other. But inspection shows all four corners of the pier complete, which rules out this possibility with practical certainty. cf the stump belongs to a still earlier building at the rear, now buried, this point means nothing.

As seen from Room 1, plaster remaining on the pier (No.5) still runs behind the later partition where it abuts the pier. ~~We have seen, however, that~~ The partition certainly is later than the rear wall of Old Rooms 1 and 2, (if they are contemporary with the stump) since its inner end abuts this ~~the~~ stump of the first thin partition; and further, that although it was erected after the pier, it must have been ~~followed immediately, as~~ part of the Room 1 rebuilding (or J-6-2nd), since it is necessary to hide the protruding stump of the early partition. The conclusion seems probable ~~inescapable~~ that this plaster on the rear of pier 5 merely means that piers, perhaps also vaults, were not only built, but plastered, before the final partition was erected, though the later was part of the same job. This is quite certain unless we are wrong in dating pier 5 as later than the adjacent walls. We have seen something like this in Structure J-2. The same thing occurs in Structure J-9, provided partitions there are part of the original plan, for which proof is not at hand. At any rate, it seems highly probable ~~to be established~~ that here in J-6 plaster does run behind an architectural element which, as was known at the time of plastering, or ~~at least~~ before the job was completed, was to be placed against it.

It will be clear that the writer believes that the rear walls of Old Rooms 1 and 2 belong to the the earliest building on this site, at this level; and that they antedate everything else. He is bound to state that this is not certain. If the early partition stump belongs to another dismanteled building to the rear, there is no proof that Old Rooms 1 and 2 are not part of J-6-2nd. The stump of an earlier building might just as well have been included as a stump in J-6-2nd walls as in any other. In this connection the agreement in masonry between the rear walls of J-6-2nd and Old Room 2 is very disconcerting. But the smaller stone which was used for the Old Room 1 rear wall, which is the one which would have to have been connected with J-6-2nd argues the other way. So does the uncertain distinction in the masonry of piers 1 and 2. So does the improbability (to the writer's mind) that the old partition would have been allowed to project just through a new rear wall instead of being broken off to a point behind it, if it was already in existence. Also, if Rooms 1 and 2 were always part of J-6-2nd, built at the same time of J-6-2nd, why was Room 3, obviously built as an addition, given heavier piers, and its rear wall placed farther to the rear. Hidden contours of bedrock might possibly account for the forward position of the rear walls of Old Rooms 1 and 2, as compared both with J-6-2nd and Room 3, though what evidence we have (which is considerable) points to the contrary. But it does not account for the heavier piers in Room 3, and there is no explanation at hand, unless they are earlier than J-6-2nd. If they are, so are the rear walls of Old Rooms 1 and 2.

In any case it is reasonably clear that Structure J-6 as a final whole includes four distinct periods of building: OLd Rooms 1 and 2 or else the hypothetical prior partition stump; Room 3; Structure J-6-2nd; Room 1.

It may be that there were ~~five~~ six periods, and this is the most likely, if the peculiar thin partition wall stump comes through from a buried building to the rear. In this case, putting Room 3 before J-6-2nd on the basis of distinct outer wall masonry and heavier piers, and therefore Old Rooms 1 and 2 and the stump also before J-6-2nd, ~~but placing~~ the various units, in probable chronological order, would be as follows: The building of the partition stump; Old Room 1; Old Room 2; Room 3; J-6-2nd; Room 1 with its throne at 9.17.15.0.0. This order is compatible with all juxtapositions, and with all indications of masonry, provided it is allowed that the front piers or walls of Old Rooms 1 and 2 were torn down in the last or next to the last period.

The writer is fully conscious that such a discussion cannot be fully followed by the reader without complete drawings, and many more photographs of masonry. It is indulged in because the chronological position of Old Rooms 1 and 2, and therefore of Room 3, is of importance in discussing vault - wall relationships later on. Merely to establish that Old Rooms 1 and 2 may have preceded J-6-2nd will be of service in that connection. We may sum up the problem by saying that they must have been erected at a different time ~~preceded it~~ unless Old Rooms 1 and 2, as contemporary integral parts of J-6-2nd, were built around an old ~~the~~ thin partition ~~partition~~ with a desire to preserve and use it; or unless they were built up to its mere stump, from either side, the stump itself being preserved to full vault height; ~~Either of these propositions seems highly improbable.~~ or else this thin partion was built, along with the rear walls, as part of the original J-6-2nd structure, but off center behind one its piers, inserted between the rear walls but not bound to the pier. Any of these propositions seem to the writer less probable than that Old Room 2 and J-6-2nd are remnants of distinct buildings.

corresponding vault heights of 1.75 and 2.15 m, respectively.

A trench through the floor of J-6-2nd shows that it was the first structure placed over bed rock at this end of the complex. The bed rock is only 50 cms. below the floor at the rear, but dips down toward the front. The fill is complex, but not on any regular plan. The bulk consists of broken rock mixed with a purplish clay, and is solid. An early terrace wall was encountered at the front, and this may have been the original terrace supporting J-6-2nd, but it was crude and is probably a constructional feature.

On the slope of the bed rock is a thick layer of stiff purplish-brown clay, mixed with small and large broken limestone rock, which has the appearance of being a natural deposit. However, in it was a lens of soft black clayish earth and charcoal, with many sherds, indicating an occupation of near-by parts of the acropolis antedating Str. J-6-2nd. Based on position found, these should be contemporary with those on the bed-rock below the earlier Court 1 floor, The lens is entirely within the bottom layer of clay, except that at the rear it touches bed-rock. A few sherds were found in the fill above the otherwise sterile bottom layer, and must have found their way there at the time of the erection of the substructure for J-6-2nd. Since the building on the latter is late, if vault-span ratios mean anything, there is probably a considerable time interval between these two groups of sherds.

Trenching at floor level revealed a crude constructional retaining wall 90 cms behind the face of the J-6-2nd rear wall, with a complex fill between. The fill, however, dated from the time of erection of Room 1 of Str. J-6, and straddles the lowest courses of the J-6-2nd rear wall, all that remains at this point.

During the 1933 season a system of deep trenches was run into Structure J-7, and by tunneling continued under Room 3 of J-6. Tunnels were also run into the hearting behind the Room 3 rear wall, and into the terrace rising from its roof. The results here cannot be properly discussed without plates,

We can, however, state that Structure J-7 involves three or more general building levels which run under and behind Room 3, and under the substructure of J-9, against the base of which Room 3 was built. A small number of potsherds were secured, most of which can be assigned to one or the other of the four building periods thus shown to have preceded the erection of Room 3. However, the series is too meagre to promise much enlightenment on pottery history at this city, though when a pottery sequence is established, they may act as checks on the dating of the buildings.

Very interesting finds on the lowest of these buried levels consist of burned fragments of wattle-clay, with the impressions of small sticks or canes on one side, the other side being smoothed and coated with white stucco. Two postholes in a stone and concrete low platform on this level make it perfectly plain that at this early time there were wooden buildings with wattle and daub walls on the acropolis and that these were nicely plastered. They were associated with stone-walled buildings nearby, but there is no reason to suppose the latter were vaulted.

One of the latter was painted red on the outside, at least in part. Color on early acropolis buildings is thus established. Here as on the surface, there was no evidence of interior painting of walls. It is entirely possible that outside walls of surface structures were colored also, the evidence having disappeared with exposure.

Excavations here, coupled with those under Str. J-2, make it perfectly clear that Court 1 of the Acropolis was originally very different.

- Objects- Cat. 7

Potsherds, a bird-effigy whistle of pottery, and one cache-jar were the only objects of the minor arts encountered while clearing Str. J-6 itself. The jar was placed in the floor of Room 1, under the retaining front wall of the supporting bench of Throne 1, its center 30 cms. northeast of the center of the bench. It was in an upright position, let into the concrete floor so

that its top was only a centimeter or so below the finishing plaster, which had been carried over it. Presumably it was cached in connection with the erection of the throne, but it may appertain to the earlier Structure J-6-2nd. The jar was unslipped and plain, but rather more graceful in form than most cache vessels at the city. It is a small olla with slightly constricted neck and outcurved rim, and gently bulging body. A flat cover, which is a mere pottery disk, had broken and fallen inside.

The contents were: two odd-shaped concretions; 1 flint chip; 2 small pieces of jade, 3 mm thick, polished on one side, smoothed on the other; 1 small perforated red shell plate, similar to many found with Burial 5; 1 fragment of thin pink shell; 4 pieces of sting-ray spine; and one small lump of a white chalky substance, coal black on one surface. Reference has already been made to finds dating from periods preceding the various units of Str. J-6.

-Date- Cds

The last date on the throne, 9.17.15.0.0., being a hotun ending and the terminal date of the inscription, is in all probability roughly contemporaneous with the erection of the throne. We have seen how intimately it was associated with the building itself. There is nothing in the masonry to suggest that the niche was not constructed at the same time as most of the rear wall of Room 1, and all of Room 1-a. Its insertion after that time would have involved changes in the support of the main half-vault above, andifficult undertaking, and would have left its mark in the masonry. It seems probable that this niche was designed to receive the supporting bench and the rear of the throne. If such is the case and the date contemporaneous, Room 1 in its final form, including Room 1-a, was erected at about the middle of the last quarter of Katun 9.

As outlined above
A further excavation in 1933 established almost beyond question the fact that the rear walls of Rooms 2 and 3, and the left or northeasterly part of the rear wall of Room 1 antedate the right part of Room 1, which contained the throne

and niche. Dimensions in Room 3 also vary from those of Rooms 1 and 2 in the matter of wall thickness. The rear walls and vaulting of Rooms 2 and 3 were not continuous. The heavy partition wall between Rooms 2 and 3 passes behind the rear wall of Room 3 but is bound to that of Room 2. However, the vaulting of Room 1 in its entirety was continuous with that of Room 2.

From these considerations we believe that Room 3 was found in its original state, but that at about 9.17.15.0.0 Structure J-6-2nd and another old building, which we will call "old Rooms 1 and 2" for the present, to which had been added Room 3, were partially dismanteled in preparation for Rooms 1 and 2 as found. This possibly, though not necessarily, involved pulling down the whole of the vault of "old Rooms 1 and 2", which formerly occupied the place of the final Room 2, and at least part of that of Room 1, as stated. This older structure is still represented by its rear wall which runs the length of the final Room 2; then, passing beyond the stump of a transverse partition wall only 45 cms. thick, which was inserted in it, it merges on an irregular line, descending to the right (southwest), with the different masonry of the bulk of the rear wall of Room 1.

It is therefore clear that parts of Room 2 and even of Room 1, and in all probability, Room 3, antedate 9.17.15.0.0, and this is of course true also of Structure J-6-2nd.

Trenching and tunneling in 1933 definitely established that Room 3 is later than the substructure of Structure J-9, including the floor of the latter. Apart from the possibility of late rebuilding on that floor, therefore, the whole J-6-1st complex is almost certainly later than Str. J-9, and trenching behind J-6-2nd would almost certainly prove that unit later also. We shall discuss the available data on the dates of these units further under "Conclusions".

Details of Construction

Miscellaneous Dimensions

The widths of Rooms 1 (including Room 1-a) and Room 2 were in all

probability the same, as there is every reason to suppose that the two missing piers of Room 2 were the same thickness as the pier against which the partition wall dividing them was built. On this assumption the room width of both was about 2.10 m., the most consistent measurement. In places this figure drops to 2.00, and elsewhere rises to a maximum of 2.30 m. Thickness of the front walls and piers varies between 70 and 80 cms., with 75 cms. as the probable thickness called for by the plan. Piers vary between 1115 and 1.25 in width, doorways between 1.65 and 1.70 meters. The vaults sprang at 2.17 above the floor, with an offset of about 10 cms.

It must be remembered that these figures do not apply with absolute certainty to the older structure which formerly occupied the position of Room 2 and at least part of Room 1. There is nothing remaining of front walls or piers which can with certainty be assigned to that earlier period, except the end wall of Old Room 2, which extends to the facade, and is about 1.25 m thick. The width of Room 3 varies between 2.10 and 2.15 m and is therefore the same as the others. But the front wall and pier thickness is consistently 90 cms as opposed to an average of 75 cms. for Room 1. The vault sprang at the same height (measured as 2.17 m), Doorways vary between 1.65 and 1.80 in width, piers between 1.20 and 1.25 m., in close agreement with Room 1, and with Structure J-2.

Room 3 is therefore a little "heavier" than Rooms 1 and 2, because of its thicker front wall, but all are "lighter" than Structure J-2, room widths being greater and front wall and pier thicknesses less than in that building. Str. J-6-2nd is the lightest of all because of its fairly light front wall, and its wide span.

The partition wall between Rooms 1 and 2 is 70 cms. thick, and hid the stump of another, belonging to the earlier building, which was only 45 cms thick. (not indicated on the plan). The wall between Rooms 2 and 3 is 1.25 thick, and was ~~probably~~ originally the outer end wall of the original ~~building,~~ "Old Room 2". ~~This is confirmed by the fact that it ran clear to the facade line of the building, and is bound to the rear wall of Room 2. The partition wall between Rooms 1 and 2, on the other hand, merely joins the pre-existing rear wall and a pier, as shown on the plan.~~

The length of Room 1 (exclusive of Room 1-a and its stairway) was 15.15m,

and that of Room 2 was 7.85 meters. The length of Room 1-a was 2.03, and its stairway extended 1.55 into Room 1. A single vault roofed Rooms 1-a, 1, and 2, and therefore was 27.28 m long. Room 3 was 11.35 long, and this was the length of its vault.

The slope of the rear main half-vault at the northeasterly corner of Room 3 is about 28 degrees from vertical, ~~while that of the transverse end half-vault which abuts upon it is about 22.5 degrees~~ (Plate 6, D), but steeper than corresponding slopes in Str. J-2, and in J-6-2nd, the first of which had narrower, the second wider, rooms.

The slope of the rear half-vault of the niche in Room 1 is about 23 degrees, as measured, and that of the partially standing side vault of the niche at the left (Plate 7, B) as measured, is 22½ degrees. Using 23 degrees as the slope of the main vault over Rooms 1 and 2 gives a reasonable reconstruction, consistent with known facts.

All these measurements are based on portions of vaults which have been disturbed little, if at all, and, allowing for inequalities in the stone, are probably correct within a degree. Possibly it is noteworthy that where artistic effect was probably the principal reason for the vaulting,--at the end of Room 3--the slope is steeper (22.5 degrees) than that of the main vault, varying by 5½ degrees. The end slope was unnecessary from a structural point of view, and could easily have been given a greater angle. We neglected to record the slope at the end of Structure J-6-2nd.

We know that the height of the terrace behind the roof of Room 3 was 4.28 above the Room 3 floor. Assuming 30 cms of exposure of the cap-stones, the height of the latter was 3.68 m. The difference, 60 cms, is the maximum thickness of the roof over the cap-stones. However, there was probably a slight roof-slope. If this was as much as 3½ degrees from horizontal, the thickness was only 47 cms. A nearly level roof seems here called for, and this reconstruction seems reasonable. These figures give a vault height for Room 3 of

1.52 m. The reader must understand that figures such as these are given to the centimeter without intending to convey an impression of great accuracy.

Reconstruction of Rooms 1 and 2, assuming a 30 cm exposure of cap-stones, using the vault slope of the niche in Room 1 (23 degrees) indicate a vault height of 1.87 m. If the roof thickness was the same as the Room 3 reconstruction, the roof of Rooms 1 and 2 was a little higher. If so, the difference was slight. This reconstruction of Rooms 1 and 2 yields approximately the same height as a reconstruction of J-6-2nd, assuming 30 cm capstonesexposures there also. This is so because the greater width of J-6-2nd is spanned by flatter vaults which were satisfactorily measured as 30 degrees from vertical, giving a vault height of 2.10 m.

Reconstruction of the three units, Room 3, Rooms 1 and 2, and Structure J-6-2nd, assuming a 30 cm cap-stone exposure throughout, using the measured soffit slopes and measured vault-spring offsets in each, but further assuming a constant roof-thickness of 47 cms for each unit, will bring the total roof height over the centers of the rooms to 4.15 m for Room 3; 4.51 m for Rooms 1 and 2; and 4.57 m for J-6-2nd. Considering the length of the units under discussion and that our check on total roof-height is at one end of the complex (behind the center of Room 3) the maximum difference of 42 cms in theoretical roof heights is small enough to confirm, rather than otherwise, the differences in vault slopes as observed.

The assumptions we were forced to make--constant amount of cap-stone exposure, and constant roof thickness--bring us close to the result called for by surface indications behind and above J-6-2nd and Rooms 1 and 2, that is, that the roofs of all three units formed, in the end, one continuous surface.

Accepting our guess that the main vault of Room 1 had the same soffit slope as its niche, we have 23 degrees for Rooms 1 and 2, following, unless the vaulting of "Old Rooms 1 and 2" was not torn down when Room 1 was constructed in its final form (a possibility), a flatter slope (28 degrees) followed in Room 3; if the reader will allow, without positive proof, that J-6-2nd, with its much wider room,

is later than Room 3, then a fairly flat slope of 30 degrees followed, ~~that in Room 3.~~ The reason in this case is clear--a wide span had to be bridged without carrying the total roof height above the terrace level behind the already existing "Old Rooms 1 and 2" and Room 3. Further excavation will determine the actual maximum roof heights of J-6-2nd and Rooms 1 and 2 with more precision.

-Walls, Piers, and Vaults - Masonry-

The piers and walls of Room 3 are essentially like those of Structure J-2. But the masonry of the Room 1 piers, with the possible exception of that on the extreme right (southwest), and its walls as well, differ in that they make a much more consistent use of rather thin slabs, resulting in a greater degree of accidental coursing. Compare Plate 2, A and B, with Plate 6, B and C, and Plate 7. Notwithstanding the more regular nature of the stone in the Room 1 construction, there seems to be more chinking than in Structure J-2.

There is a special course just under the vault-spring of Room 1 which consists very largely of small chinking stones, with some small slabs, the function of which was presumably to give the masons an easy means of leveling the top of the vertical wall so that the line of the vault-spring would be straight. (Plate 6, C). This was the section carrying maximum load (weight plus vault-thrust.) Removal of small parts of ruined vaults on two other palaces (Structure J-8 and J-11) indicates that there was no binding between vault and vertical wall. The vault simply rested on the previously-built vertical wall, which presented a level, more or less smooth surface.

As in Structure J-2, especially heavy stones are used at corners in the walls, and they are true cut stone, though the surface is left quite rough (Plate 6, C). There seems to be some intentional binding of corners, especially at the other end of the niche, not shown.

The walls of Structure J-6-2nd are interesting. The rear wall is built of well-selected stones, including some slabs, but for the most part they are blocks, thick in relation to length and depth. There is little chinking. stones are more regular than in Old Rooms 1 and Room 3, though similar to Old Room 2.

This wall may be seen in the center of the photograph, Plate 5, C; the masonry is more like that of Structure J-2. But the stones are much more regular than in Old Rooms 1 and 2, and in Room 3. Compare this photograph with Plate 2, A & B, and Plate 6, C, remembering, however, that the J-6-2nd wall is a retaining as well as vault-supporting wall, while those of Structure J-2 had to stand free.

To the left in the same picture is the transverse end wall, shown in Plate 4 by diagonal cross-hatching, and in the photograph, Plate 5, C. Notice how much cruder this secondary wall is, the stones being very irregular, with no real slabs and much chinking. This wall was put up after the front and rear walls, to which it is not tied, and 1933 work showed it to be a mere retaining wall. It still rises vertically well above the vault-spring, contrary to the general practice of sloping the upper parts of transverse walls, even mere partitions, to conform with the longitudinal vaulting. It is secondary, and Structure J-6-2nd formerly extended 2.20 m. farther to the southwest as measured along the rear wall, under the present terracing below Structure J-8, and the original end was sloping above the vault-spring. The wall in question was built to retain the fill with which the end of this J-6-2nd room was blocked, as established in 1933. This wall ~~may never have been~~ probably was never exposed at all, though it may have been.

The transverse walls (except the southwesterly end of Room 1-a, but including the above and two partitions) are "vaulted" in the sense of sloping out above the vault-spring. This feature was probably merely for effect. The partition between Rooms 1 and 2 was built against the rear wall and main half-vault, and against the front pier, and presumably against the fallen front half vault, after the main vaulting was in position. The rooms formed by the partitions are so long that the latter could have had no supporting effect on the vault as a whole.

The vault facing itself, here as in all examples observed at the city, is constructed of thin broad slabs laid in mortar and probably represents more or less true corbelling (Plate 6, C, D, and E), but in the interior there is considerable reliance on the mortar. But in the interior much reliance was placed on the mortar. The exposed edges of the vault slabs were rough and at least for the most part not beveled, the unevenness being covered by the plaster (Plate 6, D).

NB: Pag 56 was shifted to W. 54-b.

~~Rooms 1 and 2, and give a vault height of 1.50 meters.~~

The main vaults, observed in Rooms 1 and 3, and in J-6-2nd, have an offset at the vault-spring of about 10 cms; that of Room 1-a has none. Here as elsewhere in the city it is evident that the offset was not necessary in erecting the vaults of the palaces.

In the remnant of the rear half-vault at the northeasterly end of Room 3 is a beam-hole, preserving the upper half of the ~~plaster~~ mortar cast of the beam. The diameter of the beam was 8.5 cms. and the cast itself extends 25 cms. into the interior of the vault. Beyond this is an irregular hole of about the same diameter which permitted the insertion of a stick a total distnce of 1.30 m. This is in conformity with the findings of Mr. Roys in the northern cities,[24]

[24] Lawrence Roys: ~~Idem.~~ The Engineering Knowledge of the Maya, Publication No. 436, No. 6, Carnegie Institution of Washington, p. 50, Washington, 1934.

which indicate that the beams were inserted to considerable depths. The top and bottom of this hole are simply the flat surfaces of a vault slab, and if the mortar forming the sides of the cast ~~plaster~~ fell out it would rectangular. A number of such rectangular openings occur in other Acropolis vaults, and doubtless they are all beam sockets. This one is placed 55 cms. above the vault-spring (vertical measurement) and 85 cms. from the vertical portion of the end wall. (See white arrow, Plate 6, D.)

The masons at this city showed considerable evidence of getting desired results with a minimum of labor. Where, as here thinly stratified slabs are available, a thick plaster finish was all that was necessary to smooth over a vault and they did not bevel the edges of their vault-slabs. The idea, however, was not foreign to them. In the side-vaulting of the niche for some reason they used much thicker slabs, and these they roughly but definitely beveled (Plate 7, E).

An interesting structural feature occurs in the lowest of these slabs. It forms an unusually deep off-set (20 cms.) and is a specialized squared slab 90 cms. long, of which 70 cms. is in the wall at the side of the niche. It is also of a width greater than the depth of the niche, so that it covers the inner corner and extends into the rear wall of the niche. The corresponding stone on the other side is exposed completely, though the outer corner has

broken off (marked by the arrow, Plate 7, E). Both are very much longer than any other stones in the wall and both are neatly worked and are specialized stones. The rear vaulting of this niche has no offset at the spring.

~~In our reconstruction of the niche, we have assumed that it was roofed by slabs projecting from the rear in this manner, the roof being really a very deep offset construction. Apparently where such an offset was contemplated, long slabs were selected to tail deeply into the wall.~~

~~The rear half-vault of the niche has no offset.~~ In this building as in Str. J-2, we encountered what are undoubtedly specialized cap-stones. They are slabs, larger than those common in the vault facing, and are further distinguished by having the two longer sides (and sometimes the ends) roughly worked. This was undoubtedly to get the two sides roughly parallel and assure a reasonably tight fit between cap-stones. Vaulting facing slabs are roughly worked to one straight edge only, the buried ends and back edges being irregular in the extreme. This is the case everywhere in the city so far as we know.

-Floors-

The floors of all rooms are of concrete, resting directly on the ~~rock~~ fills, and covered with plaster and a finaly coat of white finishing plaster. J-6-2nd was no exception. except that here the foundation fill was solid. The bottom of the floor of Room 1 was fairly hard. The concrete evidently contained some iron compound, as it was a rusty yellow. The concrete of the floor of Room 1-a was not discolored, and was softer. In neither was there any evidence of the thick layers of clay superimposed on the concrete and under the plaster, as observed at one point only on Structure J-2.

The floor of J-6-2nd is continuous with that of J-6, but most of its finishing plaster had disappeared.

-Fills-

An excavation about 50 cms. deep in and in front of the niche of Room 1 showed that the foundation is a fill of fairly large, pure broken rock.

All of Room 1-a was removed, showing that its floor and stairway rested on a continuous pure rock fill of small stones mixed with larger. The stones rolled out when supporting masses at the side had been removed to a sufficient depth, and were therefore not laid up stone by stone, as seems to have been the case in many fills of consistently large stones. A section through the rear of the floor and supporting fill of Room 1-a is marked "h" in white ink on Plate 5, B.

This fill rested on the floor of Structure J-6-2nd, which is continuous, except for finishing plaster, with that of J-6. It was retained at the southeast by the front wall of J-6-2nd, also continuous with that of J-6. At the southwest (rear of Room 1-a and end of the building) it rested against a very crude sloping transverse wall, the lowest meter of which projects 50 cms beyond the upper part. The relation between Room 1-a and its foundation, taken and fill behind it, also taken as a unit,
as a unit, and the transverse wall is shown in Section E-F, Plate 4. The room construction is shown in solid black, the wall and the fill to the southwest which it retains is shown in hatching, the lines descending to the right. The primary function of this transverse wall was to retain another and higher fill to the southwest. The wall is again shown in section in Plate 5, B and C, and is marked in each case by the white letter "g". Notice that the chamber fill (h) passes between the "terrace" of the retaining wall (g) and the bottom of the rear or end wall (j) of the chamber (Room 1-a). That is, the floor was completely built before the erection of the end wall, although it would have been easy to have carried the end wall down about 30 cms. to rest directly on the projection of the retaining wall (g), with a consequent special foundation reaching clear to the main floor level. This tends to confirm the evidence on Structure J-2 that the practice was to lay floors complete, and then to erect walls upon them.

The side or northwesterly wall of Room 1-a, marked (i) in the photographs, like the rear or end wall, rose from its elevated floor level and not

from the main floor level 1.50 m. below. The fill under the Room 1-a floor as well as the ~~crude retain-~~ protecting lower portion of the crude retaining ~~ing~~ wall passes under the side wall (i) (Plate 5, C) and undetermined distance into the hearting to the northwest, straddling the lowest courses of the rear wall of Structure J-6-2nd (Plate 6, A). In the plan, Plate 4, the crude retaining wall and its fill, shown as one unit by diagonal hatching, and the rearward extension of the fill under the chamber, shown by rectangular hatching, stop at the wall of J-6-2nd, because the plane of the horizontal section here cut through them is considered as very close to the main floor, in order to show the J-2nd wall, here only about 30 cms. high. Both pass over this wall above this level.

In Plate 6, B, all of Room 1-a has been removed, and only the first and second step of its stairway, seen from behind, ~~i~~.e., from the south, remain in place, in the right foreground. Although the rear wall of Room 1 and the northwesterly side wall of Room 1-a were continuous, as soon as the stairway was passed the bottom of the wall shifted from the main floor level to that of Room 1-a. In the plate the unfinished end of the full-height portion is shown as the builders left it. We have only removed the fill which covered it.

The continuation of this wall at the higher level, to form the side wall of Room 1-a, had been removed when the photograph (Plate 6, B) was taken, but the slab and mortar construction on which it rested is left hanging in mid-air. The small broken-rock fill below the latter, continuous with that under the floor of Room 1-a, has rolled out for some distance into the interior. The cross-section (Plate 6, A) is cut through the middle of the construction shown in Plate 6, B.

It is evident from the ending of the full-height portion of the main rear wall in an unfinished state at the point indicated, while it continued at the higher level to form the side wall of Room 1-a, that the two rooms were designed and built as a unit. The inference is confirmed by the absence of any break in the continuous line of well-preserved masonry between the rear

or end wall of Room 1-a and the niche of Room 1. The fact that there was no offset at the spring of the vault in Room 1-a is not good evidence of its later construction, since in Structure J-9, immediately above, a 10 cms. offset occurs at one point, but gradually disappears two or three meters further along in the same room. Its presence in Room 1, and absence in the tiny dark chamber suggests that its function, at least at this period, was an aesthetic one. This need not always be the case, as its use helps to reduce vault height.

The small chamber is certainly not a secondary feature, as we at first supposed it might be.

The reason for the elevation of the floor is hard to understand. The fill under it covered or contained nothing.

The side wall of Room 1-a (that is, the southwesterly projection of the rear wall of Room 1, at and above the 1.50 m. level) rested against and probably was more or less tied into a solid backing of mortar and slabs, as shown in Plate 6, A and B. This hearting was so strong that what we left of it remained hanging in the air after the rock fill below had rolled out for a distance of 1.50 m. toward the interior (Plate 6, B). The same construction was observed behind the niche of Room 1, at and above the level of the vault-spring, and also behind the half-vault of J-6-2nd. It is therefore probable that the rear half-vault of all units of the building, and the upper part of its supporting vertical wall, were tied to a solid mass masonry hearting behind. This probably accounts for the fact that the rear wall of each room of Structure J-6 was standing to the height of the vault spring, or higher, throughout most of its length.

This construction is one of several observed instances of mortar and stone masonry apparently used as mere hearting, always in this situation. The usual thing at Piedras Negras is a pure rock fill; occasional rock and earth fills are used in connection with it. It differs from Yucatecan mortar and rubble fills in its use of thick slabs rather than irregular broken rock, and is essentially similar to interior vault construction, ~~though much cruder~~. It seems to

occur here only in this position in "built-on" buildings, and is apparently a conscious use of the cantilever principle for the rear half-vault. The situation is the same in J-6-2nd, Rooms 1 and 3 of J-6. and in J-22, another "built-on" palace, and these are the only cases yet encountered.

The heartings of both benches in Room 1 are pure broken rock.

The fill behind or southwest of the crude transverse retaining wall immediately southwest of Room 1-a, above referred to, was complex. In Plate 5, B is a cross-section through it. The wall is shown by the white letter (g) as already noted. The units of the fill shown are indicated by (b), (b'), (c), (d), (e) and (f). The white letter (a) marks the broken-down front wall common to Structures J-6 and J-6-2nd, across which the photograph was taken. The letters indicate the sequence of erection of the units marked, except that the wall "g" must have been carried up as the fill units rose in height.

The lowest meter (b) consisted of a pure rock fill of varying sized stones, from small to quite large, resting on the floor of Structure J-6-2nd. Large but irregular stones (b') were consistently selected to back the lower projecting "terrace" of the wall, to which this level corresponds. This was ~~probably~~ possibly done to give firm support to the set-back upper portion of the wall, directly above, which has no such special backing. Such foresight is contrary to the general rule, and more probably the large stones (b') held back all of the fill (b) temporarily, the lower portion of the wall (g) being erected first, as a unit.

On this unit of fill was placed a layer of much smaller broken rock, also without binding material, about 60 cms. thick, (c). This supported a layer of larger irregular stone, about 45 cms. thick, which had apparently been mixed with some poor-quality mortar (d). On this was a 20 cm. layer of small broken stone, apparently the remains of poor concrete (e). At the 2125 m. level began a layer of medium sized broken stone, probably originally a pure rock fill, but with earth washed into it from above (f). The thickness was about 75 cms., though this layer has largely fallen. Masses of falling pure rock fill, not shown on the plate, showed that the layer "f" had been covered with pure rock fill of smaller stone, which in all probability supported

the terrace floor above, which we suppose was continuous with the roof of Structure J-6.

At the higher levels, to the rear, we encountered the same slab and mortar type of hearting as seen behind the niche of Room 1 and the side wall of Room 1-2. In those cases it must have been placed after the demolition of Structure J-6. In this case (southwest of the crude retaining wall) it almost certainly had backed the rear half-vault of Structure J-6-2nd. This type of hearting was therefore probably in use, for the same purpose, at the time of erection of the earlier building.

The fill behind the crude retaining wall is the first of such complexity observed at the city, and especially it includes the first reasonably certain evidence of the ~~practice of~~ spreading of layers of concrete through hearting material. ~~It may have been customary in the interiors of vault-supported roofs, but we have not looked for it in them. It is apparently uncommon in fills, such as this.~~ It had not been observed elsewhere up to the end of the 1934 season.

The fill behind the rear wall of Room 3, below the level of the vaults, is small pure broken rock, lying against an earlier plastered terrace which is the base of the northeasterly end of the substructure of Str. J-9. The floor rests on that of Structure J-7, which formerly passed, with small platforms on its surface, below the J-9 substructure an unknown distance into the interior. The fills below Room 3 are, therefore, those of earlier buildings. They are in general pure broken rock. ~~or rubble.~~

-Stairways-

A fair impression of the construction of the interior stairway in Room 1 may be obtained from the photographs, Plate 7, B, and Plate 6, B. Each riser is a wall of slabs, of a depth less than that of the tread. The uppermost rather thin slab which forms the tread is much deeper, so that it extends a short distance under the riser wall of the next higher step. The steps are thus tied together. This was not done, or at least was not done consistently, on the megalithic flight of the main outside stairway.

Treads and risers simply rest on pure broken rock fill, with a few selected slabs or large stones immediately under them, except that a little concrete is used at the rear of the risers, perhaps to level up the treads and to get a grip on the irregular surface of the fill.

We did not trench the main outer stairway. The upper flight rests on pure rock fill which was exposed at one or two points. The stones of the fill, observed only near the surface, were small.

-Sequence of Construction of Room 1-

We can reconstruct in some detail the steps preceding the erection of the visible walls of Structure J-6, at the southwesterly end. The vault of J-6-2nd, whether standing or collapsed, was completely removed, except to the southwest, ~~where it was to be buried~~ already had been, or was now filled up, with a vertical transverse wall to retain the fill. The front vertical wall was allowed to stand, probably to full height, as were probably the two southwesterly piers, perhaps others. For no visible reason, the rear wall was largely removed--perhaps for its stone. However, the lowest two or three courses were left in place, and this demolition was carried to the southwest only to a point about 4.00 m. from the end, where the wall still rises to full height, with a remnant of the vault. This demolition was just about sufficient to permit the later erection of the crude sloping transverse retaining wall, and to extend it beyond the old building into the hearting to the rear or northwest, with little room to spare (See Plate 5, C.).

Then commenced the erection of the crude retaining wall and its complex fill. The fill was surrounded on three sides by well-preserved walls of the older structure and on the fourth by the new retaining wall. Its largest diameter was only 2.90 m. and the reason for its complexity is not clear. It apparently supported nothing but a floor or roof above, and its strength must have been less than the usual wall laid homogenous pure rock fill of large stones.

When this fill and its wall were ready, the erection of Room 1 began. The main rear or northwest wall of the new structure (Room 1) was erected on the floor of the old and ended at the southwest at a point just beyond the future position of the top step of the stairway to Room 1-a. A little beyond the niche, in the other direction, it was made to merge into the rear wall of another old building "Old Rooms 1 and 2". Next, the fill, stairway and elevated floor of Room 1-2 were constructed, or, if begun before, were now completed. Next, the main rear wall was extended, but only on this higher level, to form the northwesterly side of Room 1-a. In the meantime, unless remaining front wall and piers of J-6-2nd and Old Rooms 1 and 2 sufficed, new piers and possibly a part of the front wall had been erected. The transverse or end wall of Room 1-a was not built until the vault was in place, since the end of the northwesterly wall and vault was found in contact with the crude retaining wall, passing across the end of the transverse wall. This wall had no structural function whatever.

We can say with some degree of assurance that the niche of Throne 1 was built as part of rear wall of Room 1, and if so, its vaults were also completed as part of the erection of the main vault at that point.

The partition wall~~s~~ between Rooms 1 and 2 was erected after the main vault over Rooms 1 and 2, but probably directly after ~~not before~~. ~~The vaulting here may date back to "Old Rooms 1 and 2"~~, ~~On the other hand~~, This final partition and its transverse ornamental vaulting was probably erected as part of the Throne Room construction ~~erection~~, since otherwise the stub ~~slab~~ of the earlier thin partition wall at this point would have projected into the room. The only alternative is that the very thin old partition was not disturbed until later, which is unlikely. Room 1, the throne room, was therefore always as we found it. The L-shaped bench, of course, post-dates the final partition against which it is partly built, and may therefore, either be part of the original plan or an afterthought. Finishing plaster of the floor occurs under this bench, but may date from "Old Room 1". The same might be said of the throne and its supporting bench so far as structural necessity goes. But, in our opinion at least, the harmony of design of niche and throne taken together, and the unusual character of both, make it

highly probable that the throne was installed as soon as the building was completed, and thus dates the whole process here discussed. Finishing plaster also occurs on the floor under this bench but may easily date from earlier times (as belonging either to I-6-2nd or Old Room 1.). It is of course possible that the throne replaced an original masonry bench extending out into the room, and serving the same function, or perhaps an earlier seat-throne of this type, though hardly the one shown on Lintel 3. But these are mere logical possibilities, and there is no positive reason for denying the probability that the throne approximately dates the whole of Room 1 in its final form.

CONCLUSIONS

-Building Periods, in Court 1-

If we may be permitted to drag in Structure J-9, a plan-type 2 palace, the substructure of which (at least at its northeasterly end) descends behind Room 3 of J-6, we have under consideration no less than eleven buildings, units, and complexes. They are, with temporary designations where necessary, the following:

A: J-2 Sub - the buried floor under Court 1 and buried platforms under Str. J-2.

J-2 palace proper - Rooms 1 to 4 of Str. J-2

Rooms 5 and 6 of J-2

B: J-7 Sub-2- the lowest known building level below J-7, J-9, and Room 3 of J-6

J-7 Sub-1 - the upper building level below J-7, J-9, and Room 3 of J-6.

J-7 - the platform which runs under Room 3 of J-6, and under J-9.

J-9 - the type 2 palace behind Str. J-6

C: Old Rooms 1 & 2 of J-6 - (as we think) the dismantled structure the floor and rear wall of which was used for Room 2 and part of Room 1 of Str. J-6.

Room 3 of J-6 - which was built against the northeasterly end of Old Rooms 1 & 2.

D: J-6-2nd

Room 1 of J-6, which is partly in front of the rear wall of J-6-2nd, and which used part of its front wall and part of the rear wall of Old Room 1, as its own; together with Room 2 in final form.

We know positively from superpositions and juxtapositions that the units of Groups A to D above belong, within each group, in the chronological order in which they are set down. We can make only a partially successful effort to cut across these groups. With resources for plenty of deep trenching we could probably date all eleven units with reference to each other, and very probably tie into the series many of the buildings in Courts 2 and 3, and, no less important, the pyramids J-3 and J-4.

Room 3 of J-6 is certainly later than the substructure and apparently the floor of J-9, at its northeasterly end at least, because the J-9 substructure runs down behind Room 3. We have not made the cuts to prove it, but there is every reason to suppose that Old Rooms 1 and 2 and therefore Room 1, and also J-6-2nd, of J-6 stand in the same relation to J-9. We, therefore, join Group C to the bottom of Group B, the asterisk indicating the only doubtful case in the series:

J-7 Sub 2.
J-7 Sub 1.
J-7
J-9
Old Rooms 1 and 2 of J-6*
Room 3 of J-6.

In passing to Group D we deal frankly with probabilities, but they are worth while because they tell us where to look for proof or disproof. Room 1 of Str. J-6 is known to be later than Old Rooms 1 &2; and further, Room 1 used part of the front facade of J-6-2nd. Our best guess is that these last two stick together, because of the markedly slob- masonry occurring in both, to the exclusion of other walls. Rooms 1 and 2 immediately following J-6-2nd, This gives a slightly different series, with the same degree of probability for Old Rooms 1 and 2, indicated by one asterisk, but with less certainty indicated by two asterisks for J-6-2nd, because one probability is founded on another in that case--the position of Old Rooms 1 and 2 (in the list) above, and the assumed chronological juxtaposition of J-6-2nd and Room 1 of J-6. Room ONE carries only ONE asterisk because there is the same probability that it post-dates Structure 9, as in the case of Old Rooms 1 and 2, and it certainly post-dates J-6-2nd.

J-7 Sub 2.
J-7 Sub 1
J-7
J-9
Old Rooms 1 and 2 of J-6*
J-6-2nd**
Rooms 1 of J-6*

-Vault-Span Ratios-

Now we will bring in another sort of probability--the assumption that in vaulted buildings, other considerations being equal, there was in operation a tendency to widen rooms and make outer walls thinner, resulting in the first case in more room, in the second in more light and air and less labor in

quarrying stone and burning lime. Such an assumption is orthodox enough in discussions of vaulted aechitecture in general, but needs corroboration when applied to particular buildings. "Other things" were apparently equal in the cases of Strs. J-2 (Palace Proper), J-9, J-6-2nd, and Room 3 of J-6, and probably in the case of Old Rooms 1 and 2. ~~All~~ The first four of the above were roofed with the masonry vault, and could have been made wider or narrower. In the case of Room 1 of J-6 and Rooms 5 and 6 of J-2, ~~of J-6~~, also vaulted, the dimensions were dictated by prior factors. At least part of the front wall of Room 1 is the front wall of an earlier building, which thus determined the front wall thickness, and its position. Part of its rear wall is part of another earlier building (Old Room 2). The position of these two earlier buildings thus determined both the wall thickness and the span, which thus lose chronological significance, which must be founded essentially on technical ability as the limiting factor on these dimensions.

Similarly, the rear wall of Room 6 of J-2 is in part the wall of an earlier structure, while the position of its front wall was determined by the necessity of running it across the end of the Palace Proper, already in position. These facts were determined in 1933. The thickness of the front wall of Room 5 was determined by preexisting heavy piers, as we have seen. These two rooms form one contemporaneous unit.

In the following table we have divided the front wall thickness by the width of the front room to give an index of "weight", also setting down these two measurements for separate comparison. Where two rooms of a unit yield different percentages, we take the lowest. The same sequence is reached whether the two dimensions are combined in the index or not, excepting the two units below the line, which as we have seen, are composite using old walls.

Str.	Index	Wall	Span
J-9	.69	1.16	1.73
J-2 Palace Proper	.62	1.05	1.70
Room 3 of J-6	.42	.90	2.15
J-6-2nd	.26	.75	2.90
J-6 Room 1	.36	.75	2.10
J-2 Room 6	.30	.50	1.65
~~J-2 Room 5~~	1.00	1.40	1.40

The above sequence includes all the vaulted units of which w

The above sequence includes all the vaulted units of which we know in Court 1 together with Structure J-9 on Court 2, and in which the front wall or pier thickness and the span is known. Piers and therefor the span of Old Rooms 1 and 2 are not known. We believe in all probability the sequence is a truly chronological one, except that the last two units may very well be contemporary, or possibly should exchange places, the one with the other. Despite the confusing fact that in both these last two units the builders were not free to build as lightly as they may then have been able, we know that Room 1 of J-6 is later than J-6-2nd, and that it is very intimately associated with Throne 1 which carries a late date (9.17.15.0.0); and not only that Room 6 of J-2 is later than J-2 Palace Proper but that it has as thin a front wall as is known in any vaulted building at the city. Therefore, the J-6 unit (Room 1) and the J-2 unit (Rooms 5 and 6) in all probability belong below the line in the above table, from a chronological standpoint.

It should be noted that the above sequence, which is based on the front-wall-thickness to span ratio, with adjustment only for obvious external factors, nowhere does violence to various partial sequences which we have been able to establish from superpositions, nor to inscriptional evidence, but is in harmony with them.

Now if we can eventually gain confidence that the wall-thickness--span ratios in the above list really do indicate the passage of time, we can use them to bridge the gap to Structure J-2. Assuming the validity of these indices, with the exceptions noted, removing the asterisks where this criterion is available; and further assuming, from the indications in four deep excavations and from surface data mentioned below that vaulted buildings are not going to appear in future sub-surface work, we can combine our various lists and set up building periods and episodes for this court as follows:

Pre-vault Period

1. J-2-Sub (Directly over bed rock, fronts West Group plaza).

J-7 Sub-2 (lowest level reached here, probably lies on bed rock).

2. J-7-Sub-1

3. J-7

Vault Period

4. J-9

5. J-2 Palace Proper (Rooms 1 to 4)

6. Old Rooms 1 and 2 of J-6*

7. Room 3 of J-6

8. J-6-2nd

9. Room 1 of J-6 (With Throne 1, 9.17.15.0.0)

Rooms 5 and 6 of J-2*

On our assumptions, plus known superpositions and juxtapositions, Old Rooms 1 and 2 might have been in fifth place instead of sixth. They belong after fourth place with practically no doubt, because of position. They cannot go beyond the sixth place as assigned, without dragging Room 3 with them, and this would vitiate the assumption that, extraneous factors being absent, walls were made thinner or spans greater, as time went on. The position given requires the assumption that the piers and vault of this unit were torn down and rebuilt, for which there is some evidence, as we have seen, and none to the contrary; or that Room 2 in final form was a composite of old and new vaulting of differing spans which, as we have seen, is not unreasonable.

Rooms 5 and 6 of J-2 are placed last because Room 6 has the thinnest wall in the city. This is not considered so sure a test as the index reflecting both wall and span. The index of this room would allow this unit to take eighth or ninth place. It is known to be after the fifth place, by superposition. It is quite probable that this unit was contemporary with Room 1 of J-6. These are the only two units which occasioned the partial destruction of earlier buildings. For this reason we place both in the ninth supposed episode.

Old Rooms 1 and 2 of J-6 form the weak link in the chain. But the greater ruin of this unit requires evidence to be weak here. In any case the reader will understand that the above sequence is a tentative first attempt, and subject to revision.

Str. J-9 is the heaviest of all the palaces on the acropolis, and next to

to heaviest of all vaulted buildings at the city, and J-2 comes next in this respect. On the other hand, J-6-2nd is next to the lightest palace, with a span equal to the lightest, and J-6 came after it. But the heavy J-9 is later than at least three building levels under it, and J-2 later than a complex below it. Putting these indications together we may surmise that the two structures which are the principal subjects of this report belong close to the extremes in the chronological sequence of vaulted palaces of the city, which we hope to eventually work out, though the earlier structure J-2, dates from well after the founding of the city.

It is interesting to note that the "colonnade" or open gallery characterizes both, and that comparable piers and doorways of both are practically identical in their respective widths, the only change being in thickness of the piers. Among the other palaces of both types, which we hope to present in a later report, there is one outer doorway 2.16 m in width, but this is exceptional, apparently, in its building (Str. J-18). There is one in Structure J-8 which measures 1.88 m in width, and another in J-11 of 1.89 m. All other known outer doorways in the entire series of palace buildings on the Acropolis are 1.80 m or less in width. In only three buildings do outer doorway measurements drop below 1.50 m--in Structures J-9, J-2 (end room) and Rooms 5 and 6 of J-2. In all of these wider doorways also occur. Pier widths vary but little, the extremes being 1.12 m in Structure J-9 and 1.60 m in Structure J-23. It is, therefore, clear that in this class of vaulted building, lintel spans and pier widths remained essentially constant. Doorways were not greatly widened for more light and air, or other cause, as time went on. It follows that in studying these buildings, we do not need to discount the weakening effect of wider doorways or narrow piers as a possible inhibiting factor on thinner outer walls and greater vault spans, and the chronological significance of changes in them becomes the more probable. Neither is there reason to suspect roof combs in either of the structures here discussed, or in any of the other palaces.

-Miscellaneous-

When one considers the positions of Strs. J-2, and of J-6 in its various units and in its final form, it is easy to see why one is double-ranged and the other not, and why the later lacks the end rooms. However, stripping off the rear gallery and end rooms of the J-2 palace, for purposes of comparison, J-6 differs in being cut up into three rooms. One of these partitions comes from an old building, but that between Rooms 1 and 2 did not. And the older building was partitioned. Room 1 itself differs from anything else in either building in having a bench at one end, the niche and throne, and the peculiar Room 1-a at the other end. We are probably justified in supposing Room 1 to have been designed especially for ceremonial affairs, but there is no reason to suppose that Rooms 2 and 3 did not serve the same general function as all those of Str. J-2, whatever that was. The only real differences are in the lengths of the rooms. There was apparently no structural need for cutting the addition to J-2 (Rooms 5 and 6) into two rooms. Their purposes were probably subordinate to that of the palace proper. In ~~those rooms~~ all but the throne room of J-6, and in all those of J-2, benches or other permanent interior constructions at floor level were entirely absent.

It is perhaps permissible to state, in an informal and preliminary report such as this, what has already been suggested, that taking the hint from these two operations, we are working on

a hypothesis that vaulted buildings at Piedras Negras did not date back to the founding of the city. A good deal of deep digging must precede definite knowledge on this point. Surface hints are various. Among them is the presence of Structure J-12 on Court 2 of the Acropolis, which duplicates in all essentials the typical plans of the double-ranged Plan-Type 1 palaces, but lacked the masonry vault; and the presence in the Southeast section of long single-range open galleries, also without the vault, essentially like Structure J-6, except that they are free standing. Speaking generally, there is little in the plans of vaulted palaces, apart from end rooms and the special features of the J-6 throne-room, and apart from secondary modifications, which is not duplicated in non-vaulted buildings still extant at the end of the city's history.

What deep digging has been done in Structures O-13, K-5, R-3 (all pyramids) and here in Court 1 of the Acropolis under palaces, is in harmony with this general hypothesis. We believe, then, though we are not yet ready to prove, that while the two buildings which are the main subject of this report, differ considerably in age, they both, along with all other vaulted structures of the city, followed a period when vaults were unknown, or at least not used.

These palaces are essentially the same in plan as the palace buildings at Palenque, with the addition of transverse end rooms, so common in the Peten and in the New Empire. They differ in many ways from anything at Yaxchilan, though it is probable that some of the buildings there served the same purpose. It is fortunate that so much is standing at Palenque and Yaxchilan for, with completion of excavations at Piedras Negras, detailed comparisons of the fundamentals of the vaulted architecture of the three principal Usumacinta cities will be possible. For knowledge of non-vaulted units, excavation appears to be usually necessary, and we have made a beginning on this.

Appended is a summary table giving various measurements in the vaulted units covered in this paper, and also in J-9, which has been brought into relation to them. At the bottom are three indices designed to assist in tracing the development of vaulting. That in row A has already been referred to and is obtained by dividing the outer wall thickness by the adjacent room width or span. These measurements are on cross-section through the main units concerned--that is, the end rooms of the original palace J-2 (Rooms 3 and 4) are excluded.

The index in column B (applicable only to Structure J-9 and J-2) is obtained by dividing the sum of the front and rear room widths, plus the front medial and rear wall thicknesses by the sum of the three walls thickness, expressing the percentage on the cross section occupied by the walls. It has little meaning here, but when figured for all the double-range palaces, this index will be found not to disagree with the first, though it does not always vary from one building to the next, while the index of row A does.

The index in row C is obtained by dividing the medial wall thickness by the sum of the front and rear room widths. This again, when figured for all the double-range palaces, with minor variations of one and two per cent varies in harmony with the index of row A. That is, if Index A is less for one building than another, Index C is also less, or nearly identical. The absolute variations in medial walls are not so great as in outer walls, and this index, therefore, does not change to so great an extent as does Index A. This is why Index B, which covers the data reflected in both A and C, does not vary with so much delicacy as A. It seems best, therefore, to use A and C separately, in dealing with double-range buildings. Index A is the only one available if double-range buildings are to be compared with single-range buildings.

We should note that in figuring Index A, where as in the "palace proper" of J-2 there are four rooms to be considered, we have disregarded the end rooms. This is because they are so short that the vault problem may have been easier there than elsewhere. On the other hand, in dealing with comparable rooms, we select that room of a building giving the lowest index, as representing the

hardest problem actually solved. For Structure J-9 we use the rear room, the front giving a heavier index of 75 per cent. For J-2 we use the ~~front~~ rear room, also the ~~rear~~ front yielding an index of 65 instead of 59. Similarly for the addition to J-2 we disregard the "heavy" room 5, its heavy index obviously resulting from the thick pier of an earlier building which is used in its wall.

It is interesting to note that in both the double range palaces represented in the table, the outer walls are thicker than the medial wall. From the point of view of merely resisting the downward weight of the vaults we should expect the reverse, since the medial wall supports a double half-vault which, without any question, was heavier than either outer half-vault. The thicker outer walls might be due to either of two factors, or a combination of them: the fact that the outer walls in both buildings are much cut up by doorways, so that short sections of wall do double duty as piers; or the fact that they must resist side-thrusts as well as mere downward pressure. As a matter of fact, in examining the double-range palaces as a group we find that with two exceptions (and those not the "lightest") the piers always occur, and the doorways are wider, if anything. Yet in these buildings, the outer wall thicknesses (if we follow the order of our indices) come down to equal these of the medial walls, and in the two lightest they are thinner than the medial walls. For this reason it seems to the writer probable that the outer walls in these two buildings are thicker than the inner ones, perhaps partly because of piers, but also partly because side-thrusts are being allowed for.

It will be noted in the figures for debris depth, that the built-on buildings showed a slightly deeper deposit. This was observed throughout the Acropolis, and results from their position, which protects the rear wall. The figure given is the average of two measurements inside the room, at front and rear walls, near an outer doorway and where vaults are completely fallen. They are approximations, of course, but care has been taken to select comparable parts of each ruin for measurement. Nowhere among the Acropolis palaces does the debris depth give any basis for supposing that roof-combs of any size were placed on these buildings, and this is in agreement with what we know of the Palenque palaces.

The Piedras Negras palaces are on a hill, which has greatly affected their arrangement. At Palenque the palaces (and the temples) appear to rise on largely artificial substructures placed in a relatively flat area. Apart from this, the palaces themselves seem to have much greater affinity with Palenque than with Yaxchilan. This is seen in size, basic plan, absence of interior buttresses, and especially in wide doorways with wooden lintels as opposed to the narrower doorways with stone lintels which characterize most of the Yaxchilan buildings. The two double-range Piedras Negras palaces discussed in this paper, however, seem to be much less advanced structurally than any in the palace group at Palenque, having both thicker walls and narrower rooms. To come to a definite conclusion on such a point as this, however, requires an elaborate analysis of all the buildings at both cities. A beginning at such a comparison of these two palace groups has been made, but the results are by no means conclusive as yet.

TABLE OF CERTAIN CROSS-SECTION AND FACADE MEASUREMENTS

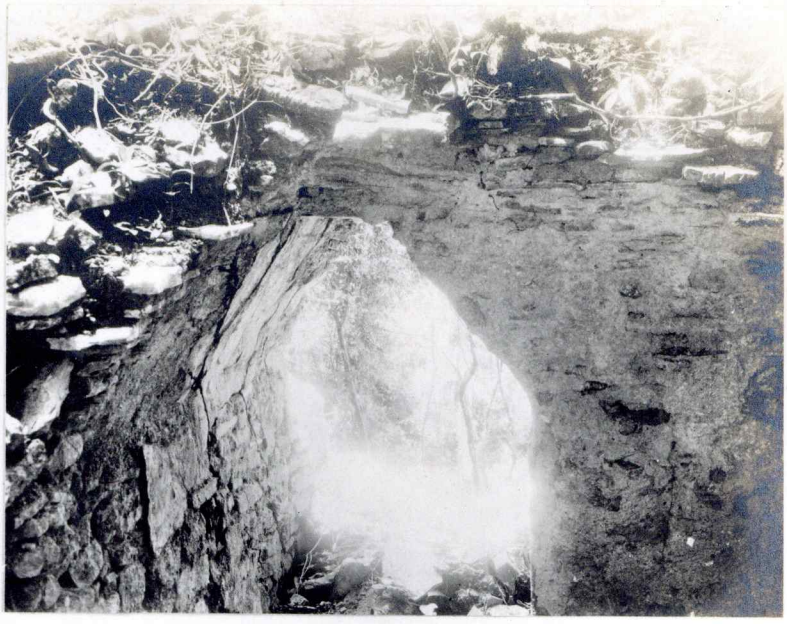
Structure:	J-9,	J-2, R'm 1-4	J-6, R'm 3	J-6- 2nd	J-6, R'm 1	J-2, R'm 6
Walls:						
Front	1.30	1.07	.90	.75	.75	.50
Medial	1.05	.92	x	x	x	x
Rear	1.16	1.02	x	x	x	x
Rooms:						
Front	1.67	1.65	2.10	2.90	2.10	1.65
Rear	1.73	1.72	x	x	x	
Spring-height	2.06	2.50*	2.16	2.00	2.17	2.50
Vault-height	1.24	.90*	1.52*	2.10*	1.87*	.95
Soffit-angle	28	34	28	30	23*	32
Thickness over cap-stones	.85*	.74*	.47*	.46*	.47*	.55*
Doorways						
Outer:						
Max.	1.75	1.80	1.80	?	1.70	1.25
Min.	1.28	1.40	1.65	?	1.65	x
Inner:						
Max.	1.48	1.60	x	?	x	x
Min.	.78	1.23	x	?	x	x
Pier Widths:						
Max.	1.72?	1.30	1.25	?	1.25	x
Min.	1.12	1.20	1.20	?	1.15	x
Average: Debris Depth	1.50	1.20	1.75	?	1.50	1.75**
Indices (%)						
A.	69	59	43	26	36	30
B.	51	47	x	x	x	x
C.	31	27	x	x	x	x

Asterisk indicates measurement on a theoretical restoration based on data believed sufficient for close approximations.

Double asterisk indicates approximation where measurement not made.

Oversized item not scanned

A



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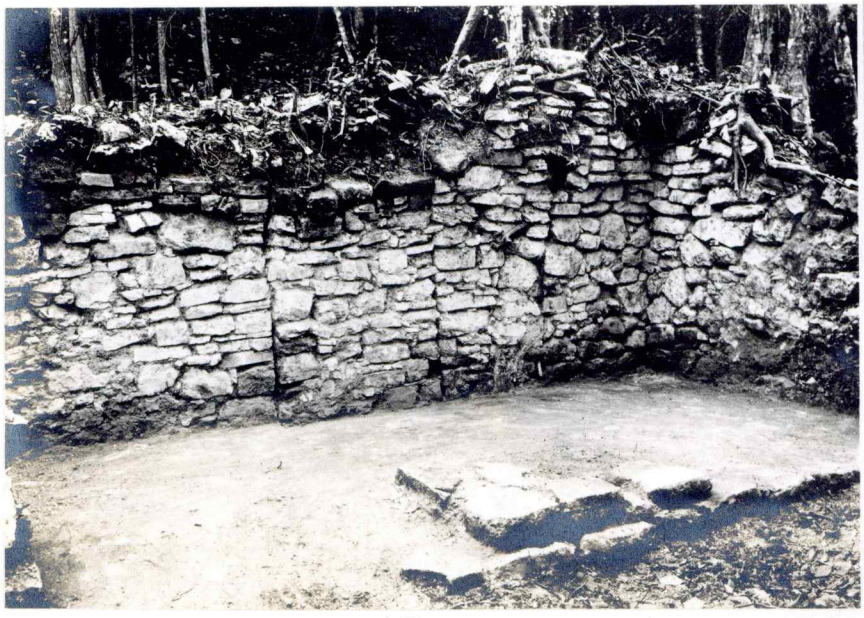
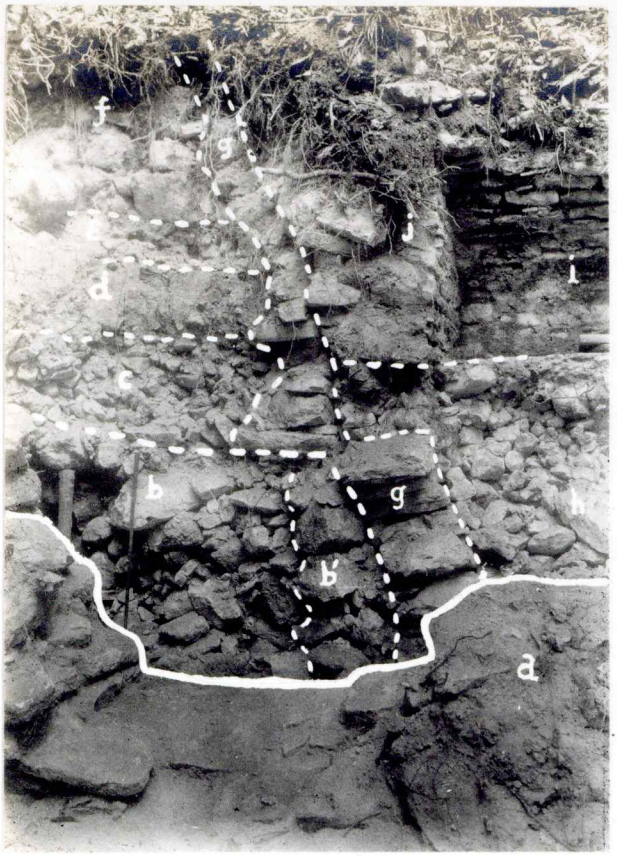


B

D

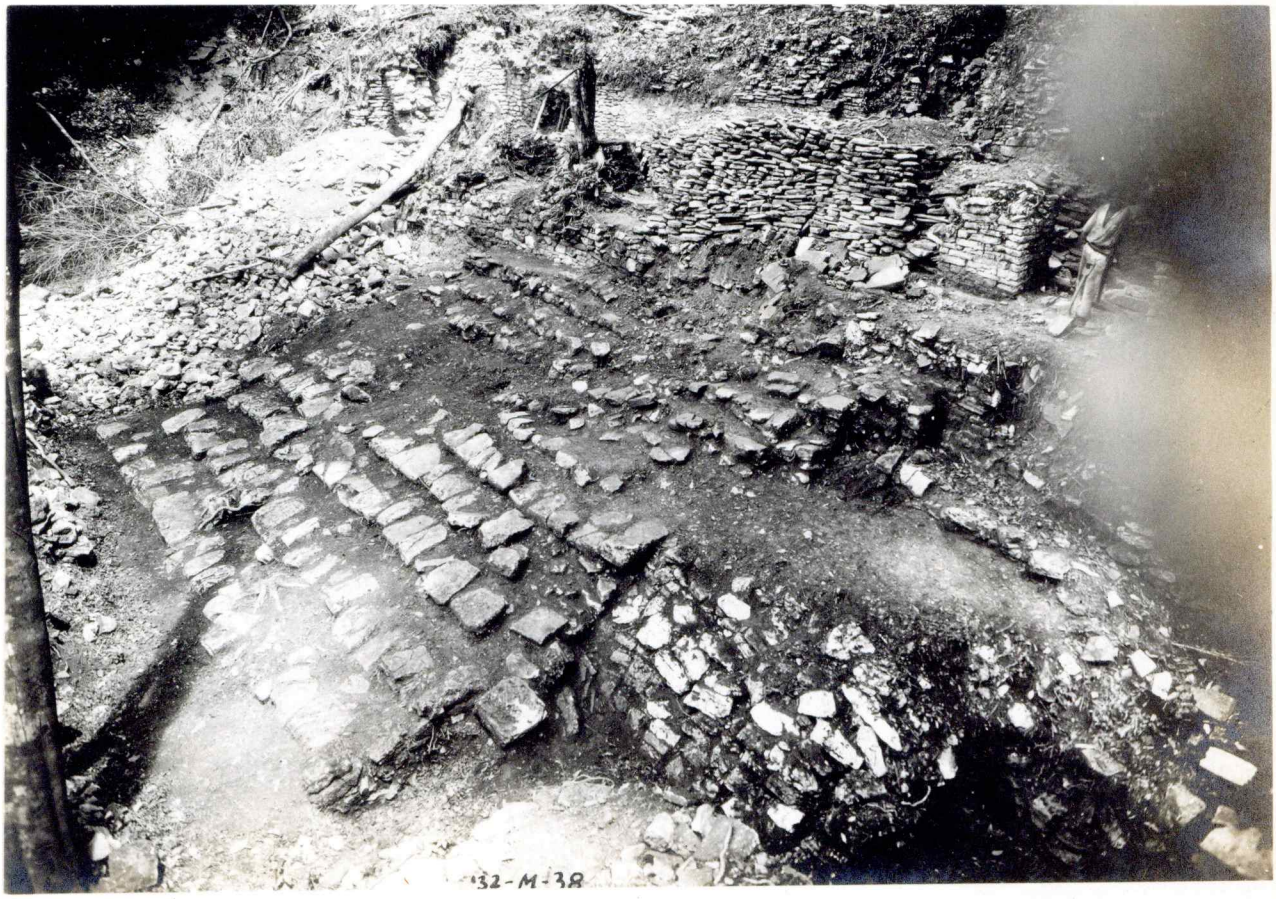
PLATE II

Oversized item not scanned



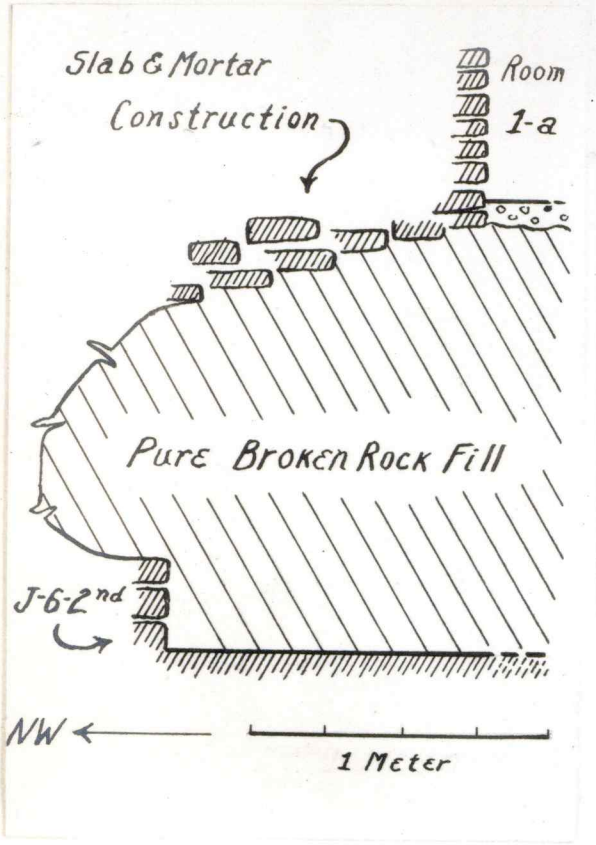
B

C

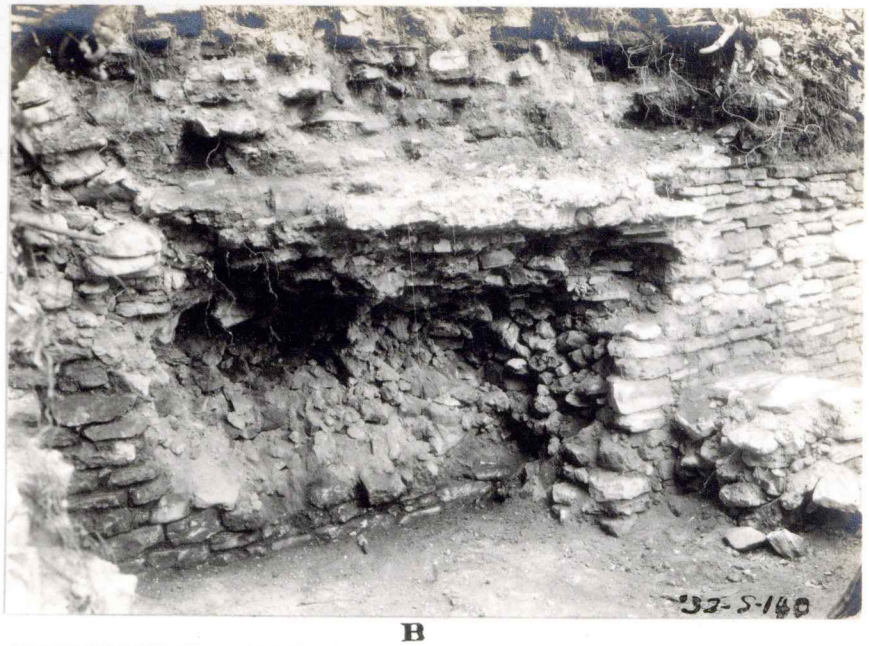


A

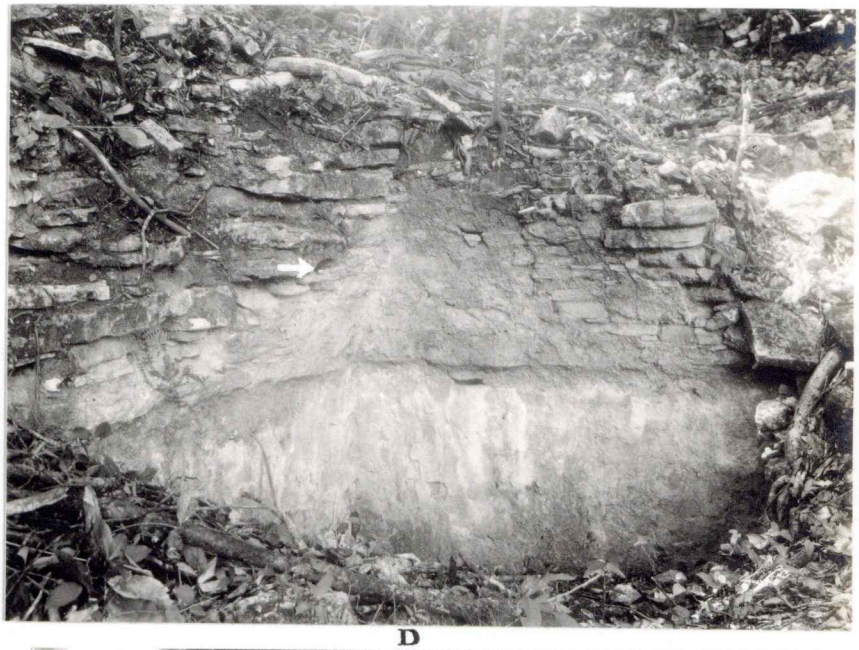
PLATE V



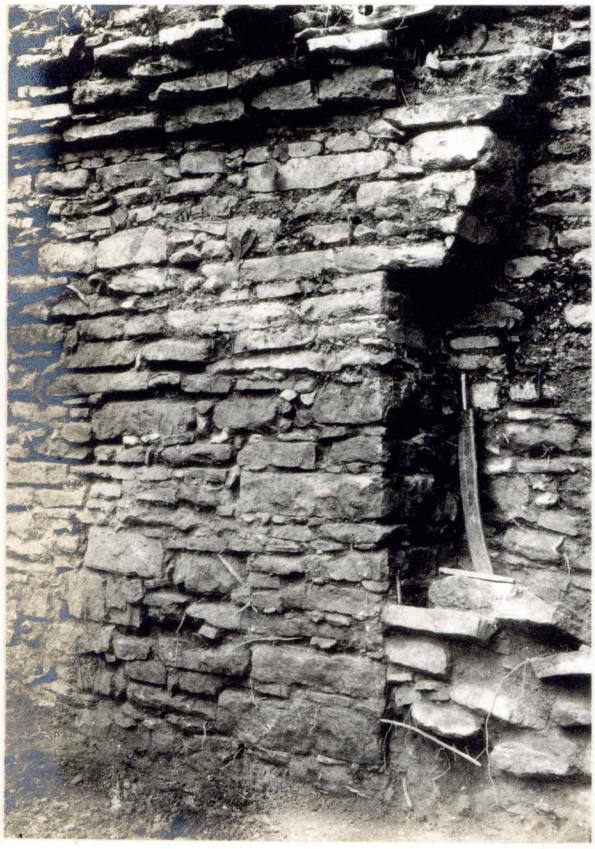
A



B



D



C

E

PLATE VI

B

C

D

A

E

PLATE VII