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FOURTH EXPEDITION TO PIEDRAS NEGRAS

1934

Summary Report of the Work at Piedras Negras - See

Separate Memorandum on Work at Yaxchilan.

Secretaria de Educacion Publica

the government of

In view of our reduced budget for this year the Department of Public Education of Guatemala, under a contract with which we work at Piedras Negras, very kindly dispensed with a literal interpretation of the clause of that contract requiring us to employ an Inspector specially sent by that department. For this reason, no reports were submitted to the department while we were in the field, and this summary will, perhaps, serve as the basis for a report to that branch of the Guatemalan government.

General Remarks

The staff consisted only of the field director and Mrs. Satterthwaite who, as usual, acted as laboratory assistant, bookkeeper, housekeeper, and took care of the catalogue. In addition she this year assisted in the development of films. Leaving Philadelphia March 20, 1934, we proceeded by water to Tenosique, via Vera Cruz and Alvaro Obregon, arriving at Piedras Negras April 9. Actual field work, with four workmen, began April 13 and continued to May 1, when we left for Yaxchilan, the important site up the river on the Mexican side. An account of our activities there is appended as a separate report. Returning May 14 we continued work at Piedras Negras with four men until June 2, and thereafter until July 2, with one man and the occasional services of another. We left camp on July 3, returning via Alvaro Obregon, by water, to Philadelphia, arriving July 13.

Our work this season was carried on under the special permission of the Guatemalan Department of Education contained in a letter from Dr. Ramon Calderon, Minister of Public Education, to Dr. Mason, dated April 16, 1934, bearing the reference number 002355. This letter authorized the director and Mrs. Satterthwaite "without excavations or removal of objects, to make in Piedras Negras studies on the architecture of the fallen buildings". Since during the first period of our work, from April 13 to May 1, a little over two weeks, we did in fact make superficial excavations in three mounds, which by the wording of the permission were not permitted, it is necessary to explain the circumstances under which this was done, and a full explanation should be given the Guatemalan Minister of Public Education, Dr. Calderon.

The excavations in question were strictly superficial - that is, we merely removed part of the fallen stone and earth which had buried the walls of the three buildings in question (Structures F-3, F-4 and F-29), and were confined to these three mounds. We did not penetrate floors, nor dig under monuments, nor in suspected burial-places where valuable objects may be expected. Request for permission

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to make this class of excavations was implicit in Dr. Mason's letter to Dr. Calderon, dated March 20, in which he said, referring to the expedition, that it would "not excavate, unless a very little for discovery of architectural elements for study" ("En Piedras Negras no excavara, sá no muy poco para descubrir elementos aseh de la arquitectura para estudiarlos.").

Adrian
 At the time of arrival at Piedras Negras we had no reply to this request of Dr. Mason, though the latter had been advised by Sr. el Dr. Recinos, the Guatemalan Minister to Washington, that he had used his good offices with his government to have the request granted. Since work at Piedras Negras is strictly limited to the dry season, which was then well advanced; since there had been a considerable delay the year previous in getting the inspector to us; and since there seemed no reason to anticipate that our request would not be granted in full, the minor excavations in question were made before the reply from Dr. Calderon (letter No. 002355) was forwarded to me. No excavations, even of this minor class, were carried out after receipt of that reply, at the camp - that is, after May first. with a view

As in former years, a full set of photographs, in duplicate, has been prepared for the Department of Education, and a translation of the Photographic Catalogue is being made. On receipt of these, the Department will be able to see with clarity the exact extent of these minor excavations, prosecuted only during the first part of our stay, and before the letter number 002355, or word of it, was received in the field. These excavations are fully covered by the following photographs: Structure F-3, by Nos. 34-2 to 34-13; Structure F-4, by Nos. 34-14 to 34-24; Structure J-29, by Nos. 34-26 to 34-90.

The field director wishes to state that he made the decision to prosecute the above mentioned minor excavations in advance of receipt of the formal permission from the Department of Education on his own responsibility, although he was at the time under the impression (a mistaken one) that this was what he was expected to do by his chief, Dr. Mason.

The permission (letter No. 002355) did not arrive at Piedras Negras until after we had left for Yaxchilan, and was first seen by the director - field director on his return. The entire matter was immediately explained to Sr. Don Silverio Camposeco, Receiver of Customs for the district, who was authorized by the permission to oversee and report on our work, and to inspect our baggage on departure. He had at that time (about May 15) been visiting Piedras Negras for several weeks, and was fully cognizant, in an unofficial capacity, with all our field work. He was given a copy of the letter No. 002355, he undertook to discharge the duties placed upon him by it, but left the same day for his home at Desempeño, three hours by mule from Piedras Negras, promising to return shortly. The men, from the time of our return from Yaxchilan, were kept busy clearing bush, preparing buildings for photography, and assisting the field director in making surveys and surface studies.

The Receiver of Customs did not, in fact, return again to Piedras Negras, until three days before we left. He was prevented

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from doing so by illness, as I was informed on several occasions when I sent word to him at Desempeño.

June 30

Nevertheless, on his return on ~~July 1st~~, he was in a position to learn of our activities, since he knew our remaining workmen and our two cooks, and his daughter had remained at Piedras Negras during the whole time, in order to avail herself of our medicines, which at all times are dispensed without charge to the inhabitants of the district.

He (the Customs Inspector) checked all objects which had been found at Piedras Negras, or presented to us, with a list showing the catalogue number of each, and personally saw them packed, and sealed the boxes. These were left in the camp laboratory under the care of our permanent caretaker, with instructions to let no one open or disturb them, unless on governmental authority. The Customs officer also inspected our baggage so that he could report that no objects were taken away, sealed them, and personally watched us depart. All of this was done in accordance with the requirements of the letter No. 002355 from the Department of Public Education. A copy of the "Acta" or report which he was about to make to that department, which he wrote out and desired me to reduce to typewritten form for him, and which he thereupon signed and requested the field director also to sign, is attached hereto. As part of that document there is a certified list of all objects encountered or presented to us, with their catalogue numbers.

The requirements imposed by the Department of Education have thus been scrupulously fulfilled, with the single exception that before we understood that we would not be permitted to seek the outlines of buildings by partially removing the fallen debris which hid them, this was done in three mounds. The Department should be assured that this was done without any intention of exceeding our authority, that the interests of the government and of science were as carefully looked to as if a regular government inspector had been present, and that in future we shall take care to have arrangements concluded at an earlier date. It might be well to point out that we were so late in our request this year because, up to the last minute, we hoped to have sufficient funds available to be able to ask them to send a special inspector and to carry out a normal program.

and complete

Specific Results.

During the initial period of a little over two weeks, we made the superficial excavations above referred to. These were in the Northeast Section, thus for the first time extending our operations north and east of the principal ceremonial groups of the city. The three mounds selected were Structures F-3, F-4 and J-29. These are among the four or five mounds of this area which give evidence on mere inspection of having been roofed with the masonry vault or "Maya Arch", the history of which is one of our principal objectives. Since the first two are in the "House-mound" area, which seems to be characterized by the almost complete absence of vaulted structures, their investigation took on added interest. Could we,

or could we not, say that here, the more permanent and impressive masonry vault was confined to temples and so-called palaces?

Structure F-3 The fallen debris which buried this small building, set on a low platform, was cut by a trench from front to rear, at the center, about one meter wide. This revealed the floor and walls along this line, and, combining this information with a careful survey of the other parts of the mound, enabled us to draw the complete plan with reasonable accuracy. For the extent and nature of this trench see photographs Nos. 2 and 4.

The building was without question roofed with the masonry vault. This confirmed our prognostications from surface examination only, a matter of considerable satisfaction, since it is important to develop reliable criteria from which we can recognize the presence or absence of fallen vaults without excavation. It will never be practicable to excavate all the mounds in a large Maya center (though we hope to do so here). Yet it will be necessary to know the distribution of vaulted buildings in a large number of cities before the history of this major engineering achievement of the Maya can be told. Also in many cases, knowledge of the nature of the roof structure promises to be of value in assigning particular structures to particular time periods.

This is the first vaulted building yet proved to exist outside the great ceremonial areas, as it is the first small structure on a low platform known to have had this type of roof. Its position poses the possibility that vaults were to some extent used for dwelling houses. This in turn makes its relative dating of great importance.

We are trying to establish the proposition that the vaulted buildings at Piedras Negras became progressively lighter as time went on - that is, their walls were made thinner and their rooms wider. We measure the degree of "lightness" by determining the ratio of the outer wall thickness to the width of the room served by that wall. The resulting index states, in per centage, how much less the wall thickness is than the room width. A high per centage means thick heavy walls or narrow rooms (usually both) while a low percentage or index means thin walls or wide rooms (generally both).

The wall-span index for this building is one of the lightest at the city, and the lightest for a building of this particular class, indicating, according to our hypothesis, a relatively late date. This is in harmony with the apparent rarity of vaulted buildings among the supposed residential structures surrounding the ceremonial centers. One is led to suspect, and to set up the hypothesis for future tests, that only toward the close of the city's history were its resources such as to permit the extension of the vaulted roof (the most costly in labor and materials) to buildings of minor importance.

On the floor was found a small plain cylinder of limestone. Stones entirely similar (except that this one showed traces of red paint on the sides) have heretofore been found only in buried positions

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at the ^{foot} of stelae and under temple floors. This piece, combined with another found later on the floor of the nearby Structure F-4, enables us with some assurance to assign the probable original function of all as small altars of a portable nature. If this and the next structure were dwelling houses (of priests or nobles) we may reasonably suspect that ~~in them~~ religious devotions of a private or family nature were part of Old Empire life, at least among the upper classes. It is interesting to note that household altars are still common in the district. We should be able to establish whether or not they had their beginning with the coming of Christianity, by ~~the~~ extensive investigation of house-mounds, which has only been begun. This stone was removed to the laboratory and catalogued in order to preserve the red color on its sides.

Ten broken fragments of pottery, of several classes, were found in the debris. They indicate the probable existence of the types at the time of ^{the} building's erection. No other objects were encountered, as was [^]expected in this type of excavation. The catalogue numbers of these objects are NE-2-1 to NE-2-3.

Structure F-4 This is a small mound on the same court as F-3, though facing toward the main plaza of the Northeast Section. The fallen debris was trenched on the center line, as with Structure F-3, and then since a plan hitherto unknown at this site, and rare in the Maya area generally, was indicated, the fallen debris was removed from the inside of the right half. Again, sufficient was done to make the drawing of a complete plan possible. See Photographs Nos. 34-04 and 34-1.

The building was vaulted, and our remarks as to the vaulted nature of Structure F-3 apply with equal force to this building, with this further remark: the wall-span index is by far the lightest yet found at the city for this class of structure (that is, a free-standing single range of rooms) and next to the lightest of all vaulted buildings, of every class, at the city. A late date is indicated, provided this method of dating finally gains acceptance.

The unusual plan involves a central chamber, with doorways leading to chambers at either side. The partitions are so staggered as to suggest a conscious plan to use them for maximum reinforcement of the vault, a practice fairly common at Yaxchilan, but unknown heretofore at Piedras Negras. The uniqueness of the plan tends to confirm the late date, assigned on the basis of the wall-span index.

The rooms are nearly square, and the end ones were well lighted, with cross-ventilation through two doorways each, in addition to the communications with the central room. Combining this superior lighting and ventilation with the building's position on a low platform in a house-mound area, we may tentatively conclude that we are dealing with a dwelling of a superior class, though hardly comparable with the great so-called palaces.

The central room was equipped ^b with a plain portable altar, similar to that of Structure F-3, but without remaining traces of color. It was not attached to the floor, but we left it in position, behind the center of the front doorway, close to the rear wall. It is possible that this central room was a species of private chapel serving dwelling rooms on either side. The thought gains a little weight from the fact that the facade was probably decorated with stucco reliefs, like the more pretentious buildings of the ceremonial centers. It is of course

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possible that the building was a temple of minor importance. We shall not be able to speak with assurance about the functions of many types of buildings until all mounds at type cities such as this have been investigated, and all lines of evidence correlated.

The only objects recovered were scattered potsherds (representing types in existence when the structure was built, in all probability), a small stone tool (possibly a hammer) and fragments of stucco ornaments which probably adorned the facade. Some of these carried traces of color. The catalogue numbers of objects from this operation are NE-3-1 to NE-3-9.

Structure J-29 This is a "false" pyramid, of major proportions, built against the back of the Acropolis hill, facing Structures F-3 and F-4. It is the only one of its type outside the main ceremonial groups, and the last to be investigated, and was therefore of considerable importance, and its investigation a necessary step in the collection of material for a complete account of Piedras Negras temples. We expected something very different from what we found, so that, as in the case of Structure F-4, our exploratory center trench was extended to include the removal of fallen debris from the left half of the chamber, and from the front portion of the left outer wall. See photographs Nos. 34-30 and 34-64. The right half may be assumed to be symmetrical with the known left and we were able to reconstruct the entire plan with assurance that it is, in essentials at least, correct.

Reasoning from our knowledge of all other pyramid temples of the city, and the distribution of their various types, we had concluded that this one must be vaulted, although the shape and extent of the mound was far from what we thought it should be in such a case. Our investigation proved that it was indeed a vaulted temple, and that a unique plan accounted for the deceptive appearance of the mound of debris. Our criteria for recognizing fallen vaults - the depth of debris, the presence of quantities of large slabs and mortar directly on the floor, the presence of specialized cap-stones, the slope of the debris surface away from the rear wall of a front room - all held good. Our doubt as to roof-type on preliminary surface examination had resulted from ignorance of the existence of a temple type in which a front vaulted chamber is backed by a solid mass which cannot collapse. We had looked for the chamber in the wrong place. The work on this structure thus warns us to be cautious in dealing with unfamiliar types of mounds, but at the same time puts a new type into the category of known types.

Although this temple falls in the vaulted period of temple construction, contrary to expectations its vault-span index indicates an early part of that period for its construction. The index is the heaviest yet found at Piedras Negras. We are led to set up the hypothesis that the masonry vault was first here used with the intention of expanding the principal ceremonial areas to include the Northeast Section and that this intention was given up in favor of rebuilding the older groups, giving them the more modern buildings. This process, we think, changed the whole complexion of the West and East Groups, and had just begun to modernize the South Group. Apparently, apart from this temple and the great stairway next it, the Northeast Section was allowed to remain a residential area.

T^{at} this building is one of the earliest, if not the earliest, vault

building of the city. ~~This~~ is to some extent confirmed by the presence of the column altar, found in this case in position in a niche in the rear wall of the chamber. This type of ~~slab~~ altar has been found in all non-vaulted temples, two of them at buried levels, and in the vaulted temple Structure K-5-1st, the later being associated with dated stelae and a so-called lintel. Similarities in the plans of the chamber of that temple and of this link them together as probably belonging to the ~~yearly~~ part of our supposed vaulted period which, on the basis of the K-5 dates and the heavy index of this similar chamber, probably began long after the city had been founded and grown to some importance with perishable material roofs. We had come to this tentative conclusion a year ago. This operation strengthens the hypothesis.

The building gives us two details of plan which are of considerable importance, since they are unique in the region, and perhaps in the Maya area as now known.

a. Although the building is deep enough to allow for two chambers, one behind the other, there is but one chamber, at the front. Behind is a solid mass, which we have reason to believe was originally constructed as such, and is not a rear room subsequently filled up.

b. From the back and top of the altar niche (itself an uncommon feature) a long ~~flue, led~~ ~~passing~~ passing through the solid rear mass, led to the open air at the rear of the building, rising as much as it could without coming out above the medial cornice. Position and smoke stains leave no doubt that this somewhat elaborate arrangement was intended as a ventilator to carry off the smoke from the altar fire in the niche. A subsequent modification of the niche may have been intended to make this chimney arrangement draw better, and some knowledge of the principles of a good fireplace may have been involved.

Besides the usual scattered potsherds and a figurine head or two, two finds of considerable scientific importance were made, though their destroyed condition gives but a feeble idea of their former artistic value.

a. The first is six fragments of a badly eroded sculptured slab, which had been broken up and used as mere building stone when the temple was erected. The temple must therefore have been built after the stone was destroyed. Here we have additional evidence that although the building involves the heaviest and structurally most primitive stone vault known from this site, it can hardly have been one of the earliest temples built. There must have been a period during which the stone was carved, used, destroyed and reused as building material. It is extremely unfortunate that the long inscription is illegible, as it would be first-rate evidence for an approximate dating of the introduction of the vaulting technic. It is hoped that we may yet gain some knowledge of the date of this stone ~~by~~ ^(by) stylistic comparisons.

This piece is important in another respect. Remaining red color and an ornamental groove running along the top and end edges prove that it was not designed as a door lintel, but was in all probability a vertical panel, designed to be let into the wall of some building or other structure. This gives us a definite clue as to the real

nature of eleven of the thirteen carved ~~slabs~~ slabs which have been put down as lintels but which, for a number of reasons, have been under suspicion for some time. This is the first of this class of stone which shows that it could not have been a lintel, and shows so many similarities to the others as to make almost certain our deductions as to them. The catalogue number of this piece is NE-4-13. See photographs Nos. 34-70 to 34-75.

The elimination of Piedras Negras as a city where the carving of stone lintels was practiced to any extent throws the nearby site of Yaxchilan into sharp relief. Indeed it leaves that city, with fifty-five known examples, the only city in the whole Maya area, so far as now known, where more than a minor ~~sporadic~~ sporadic use of this structural member ~~was~~ as a field for artistic embellishment is indicated. Some day this fact must be explained. Indirectly this stone, wholly destroyed in Maya times, serves further to show that the cities of the Usumacinta region, contemporary and doubtless in close communication, were astonishingly independent of each other in many ways.

Specifically uninteresting finds such as this will eventually form a firm basis for deductions as to political organization, degree of artistic freedom, and so forth, ~~among~~ among the Old Empire Maya. It is to this important class of knowledge that archeology, according to a common view, can contribute little. The complete investigations of type cities, on one of which your expeditions are now engaged, should form a fair test of this view. We can report that ~~already~~ we have a considerable body of evidence that, while using common fundamental concepts, methods and materials, the architects and artists of the three neighboring cities of Palenque, Yaxchilan and Piedras Negras were remarkably independent of each other in the manner in which they used their common heritage. Since this independence extends to the fundamental plans of temples, and since sculptural art was obviously the handmaiden of religion, a like degree of independence among the directing local priesthods may be inferred.

b. A second find, again of little remaining (though originally great) ~~esthetic~~ esthetic value, adds to our knowledge of stucco modeling at Piedras Negras. Data on this is scarce because of the perishable nature of the stucco. In the debris covering the temple chamber (but not outside) were recovered part of the forehead and one eye of a more than life size head, an ear plug, a rosette and two delicately modeled fingers, all to the same large scale. With little doubt, these come from a figure broken up before or at the time of the erection of the building, and were thrown in the masonry of the roof. Like the stone slab, they probably date back to a pre-vault period in the history of the city.

This is the first evidence that large sized stucco heads (of which two, likewise broken up, have been found in former years) come from formerly complete, or partially complete, bodies. It is the first to show grotesque features. In this case there were huge bulging eyes and a broad flattened nose-root. It is, possibly, from a figure (idol?) of the rain-god.

The quality of the modeling is very fine, giving us a third example to prove that stucco modeling in this region was the equal of stone carving. As in the other cases, all parts recovered had been smeared

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roughly with a thick coating of white plaster, completely obliterating the beauty of the piece. The meaning of this remains to be elucidated. There is no doubt that it occurred during the occupation of the city by the classic Maya, and not during a later occupation by peoples lacking their ~~an~~ feeling for beauty. The other two examples came from below the floors of temples, this probably from below the surface of the roof. Possibly figures from obsolete temples were broken up and deposited in the masonry of new ones in order to transfer or instill some transcendental virtue in the new building, and the smearing may have been part of the ceremony. Such a use recalls the broken fragments of old stelae in the foundations for later ones at Copan.

Certain types of potsherds, found in the debris over the chamber floor, probably come from the same source, and the existence of the types before the building of this temple may be postulated. Sherds, stucco fragments, fragments of four figurines and the carved panel fragments were catalogued (Nos. NE-4-1 to NE-4-7) and left in the camp laboratory, sealed by the Customs Officer.

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The above account covers fully the only three operations in which excavations of any sort were made. On our return from Yaxchilan about two weeks were devoted to drawing the plans and sections and analysing the results of ~~the operations~~ these operations. In addition, during this period a large area of bush was cleared around Structures F-2 to F-4, and from the J-29 pyramid, and a surface study made of the later, with an accurately measured and leveled cross-section. The major features of its design were made out, without excavation. After letting three of our men go, we transferred our studies to the East, South Groups, and the Southeast Section.

Structure P-7: From this time on, most of our attention was devoted to Structure P-7, which was partially excavated by Dr. Mason in 1931, our first season. It was felt that this building, which in plan is absolutely unique in the Maya area, was of major importance because there seemed little doubt that the roof was a combination of masonry vaulting with a flat beam-and-concrete roof. Such a combination is of great interest for the history of Maya architecture, and has heretofore been unknown. In addition, the flat concrete roof has not been reported, even when used alone, from the Old Empire area, and may be supposed to have been originated in the arid highlands outside the Maya country. It was felt that in laying before our colleagues the evidence for such unexpected features we should have a new and more complete set of drawings, including especially careful cross-sections at many points, combined with a careful study of the fallen debris, and a search for anything else which might have a bearing on the roof construction. In other words, to apply to this building what we had learned since 1931 in regard to fallen vaults. The drawings and observations were carefully made, and while the results have not as yet been submitted to Dr. Mason, they will, the writer believes, assist him materially in sustaining his interpretation of this remarkable building. While considerable bush clearing in neighboring areas went forward, most of the writer's time was devoted to this structure during a period of nearly three weeks.

with certainty,

Miscellaneous. The remaining time was devoted to checking up various

measurements and observations of other years, notably among the Acropolis structures and the important pyramid temples K-5-1st and O-12; and in making surface studies and surveys of about a dozen mounds in the South Group and the Southeast Section. Results here were especially gratifying, as we were able to establish, without excavation but beyond question, the presence of two non-vaulted long galleries or "palaces". Only one of these was hitherto known, and was of the same somewhat complex plan as the vaulted Acropolis palaces, and was placed among them. 7/4

The new palaces - Structures S-17 and S-18 - are of simple plan, without rear or end rooms. Their type, position and mere existence strengthens materially our theory that the surface buildings in the southern part of the city are hold-overs from an early period when the famous Maya vault was, for this city, a thing of the future.

Reasons for supposing all the vaulted temples of the city to belong to a relatively late period of its history have been lightly touched upon above. While we need further work to be sure, we are now in a position to set up a hypothetical but logical outline for the history of the Piedras Negras palaces as well: our knowledge begins with a single long open gallery, non-vaulted (Structures S-17 and S-18); next, the gallery is doubled (one at front and rear, separated by a medial wall) and end rooms are added. This development took place on the Acropolis long after the founding of the city, as we know from stratigraphic excavations there. Possibly there are missing steps between, and even if not, the passage of time is implied. The roof is still non-vaulted (Structure J-12). After this, the fundamental palace plan remained unchanged for free-standing palaces, but the roofs were vaulted (the seven vaulted palaces of the Acropolis). A subtype (possibly not new), the "built-on" palace adapted itself to the Acropolis terrain. From the point of view of use, this was essentially the same as the simple non-vaulted galleries found this year. Yet one was built to house a late monument (Room 1 of Str. J-6, enclosing Throne 1). The long open gallery persists throughout, so that a common function may be assumed for all. While among the vaulted palaces the plan remains essentially constant, there are minor differences, and the vault-span indices indicate a progressive mastery of engineering technique, which again implies time. Our surface studies have thus aided us in bringing the palaces into line with the temples, giving us valuable support to the thesis that the architectural history of the city comprises two major periods - the first in which the Maya vault was not used at all, and the second in which it was at least the rule for important buildings.

Whether during our postulated pre-vault period the vault was known, but beyond the abilities or resources of this particular city, can be determined only when type sites from all sub-areas are well known.

Our belief that nearly all the buildings of the South Group and Southeast section were non-vaulted (in sharp contrast to the West and East Groups) was greatly strengthened by careful observations and measurements on the surface of the important structures O-2, and of Structures S-5, S-6, S-7, S-8, S-9, S-10, S-11, S-12, S-13 and S-16. A similar study was made of the important mound P-6. In all of these cases we were able to say that there is practically no doubt that the vaulted roof was absent. In addition, in Structure S-19, we added one more to the known examples

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of a special class of small buildings, probably temples, which are placed on low platforms, have very low and narrow single front doorways, which are bridged with massive unsculptured lintels. Some of these were probably vaulted and others probably not. This point must be finally determined by excavation, as complicating factors such as depressed passages, and relatively large interior constructions are known to occur in some of them. Their investigation is all that remains to be accomplished before we will be in a position to give a fairly complete account of ~~the~~ all the clearly ceremonial buildings (i.e. temples) of the city. The heavy lintel confirms further our deductions as to the dimensions in vogue for this structural member, and adds another bit of evidence that most of the so-called carved lintels of the city were in fact something else.

In this class of work, of course no objects whatever were encountered, as the area had been previously examined superficially for map-making purposes, and the vegetation was not thoroughly removed. However, we were able to make a splendid addition to our important collection of figurines, which, with a few other objects, were picked up in neighboring districts, or close at hand, and presented to us by friends of the expedition. For most of these we are indebted to Sr. Ruffino Ramos, one of our workmen, who found them while preparing his nearby cornfield. The catalogue numbers of these gifts are M-23-1 to M-23-21; M-24-1 to M-24-2; and M-25-1.

During the course of the season, for most operations field sketches were worked up into careful drawings to scale, a practice which greatly minimizes the chance of error and omission, a fact which was made apparent again and again. Objects were cleaned, catalogued, drawn and safely deposited in boxes sealed by the Customs Receiver. A total of one hundred and ninety-six photographs were made and developed on the spot, and eighty-six more, taken elsewhere, especially at Yaxchilan, were there developed.

Respectfully submitted,

Linton Satterthwaite Jr.
Field Director.

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General Remarks

The staff consisted only of the field director and Mrs. Satterthwaite who, as usual, acted as laboratory assistant, bookkeeper, housekeeper, and took care of the catalogue. In addition she this year assisted in the development of films. Leaving Philadelphia March 20, 1934, we proceeded by water to Tenosique, via Vera Cruz and Alvaro Obregon, arriving at Piedras Negras April 9. Actual field work, with four workmen, began April 13 and continued to May 1, when we left for Yaxchilan, the important site up the river on the Mexican side. An account of our activities there is appended as a separate report. Returning May 14 we continued work at Piedras Negras with four men until June 2, and thereafter until July 2, with one man and the occasional services of another. We left camp on July 3, returning via Alvaro Obregon, by water, to Philadelphia, arriving July 13.

Our work this season was carried on under the special permission of the Guatemalan Department of Education contained in a letter from Dr. Ramon Calderon, Minister of Public Education, to Dr. Mason, dated April 16, 1934, bearing the reference number 002355. This letter authorized the director and Mrs. Satterthwaite "without excavations or removal of objects, to make in Piedras Negras studies on the architecture of the fallen buildings". Since during the first period of our work, from April 13 to May 1, a little over two weeks, we did in fact make superficial excavations in three mounds, which by the wording of the permission were not permitted, it is necessary to explain the circumstances under which this was done, and a full explanation should be given the Guatemalan Minister of Public Education, Dr. Calderon.

The excavations in question were strictly superficial - that is, we merely removed part of the fallen stone and earth which had buried the walls of the three buildings in question (Structures F-3, F-4 and F-29), - and ^{they} were confined to these three mounds. We did not penetrate floors, nor dig under monuments, nor in suspected burial-places where valuable objects may be expected. Request for permission

to make this class of excavations was implicit in Dr. Mason's letter to Dr. Calderon, dated March 20, in which he said, referring to the expedition, that it would "not excavate, unless a very little for discovery of architectural elements for study" ("En Piedras Negras no excavara, sã no muy poco para descubrir elementos azeb de la arquitectura para estudiarlos.").

At the time of arrival at Piedras Negras we had no reply to this request of Dr. Mason, though the latter had been advised by Dr. Recinos, the Guatemalan Minister to Washington, that he had used his good offices with his government to have the request granted. Since work at Piedras Negras is strictly limited to the dry season, which was then well advanced; since there had been a considerable delay the year previous in getting the inspector to us; and since there seemed no reason to anticipate that our request would not be granted in full, the minor excavations in question were made before the reply from Dr. Calderon (letter No. 002355) was forwarded to me. No excavations, even of this minor class, were carried out after receipt of that reply.

As in former years, a full set of photographs, in duplicate, has been prepared for the Department of Education, and a translation of the Photographic Catalogue is being made. On receipt of these, the Department will be able to see with clarity the exact extent of these minor excavations, prosecuted only during the first part of our stay, and before the letter 002355, or word of it, was received in the field. These excavations are fully covered by the following photographs: Structure F-3, by Nos. 34-2 to 34-13; Structure F-4, by Nos. 34-14 to 34-24; Structure J-29, by Nos. 34-26 to 34-90.

The field director wishes to state that he made the decision to prosecute the above mentioned minor excavations in advance of receipt of the formal permission from the Department of Education on his own responsibility, although he was at the time under the impression (a mistaken one) that this was what he was expected to do by his chief, Dr. Mason.

The permission (letter No. 002355) did not arrive at Piedras Negras until after we had left for Yaxchilan, and was first seen by the ~~director~~ field director on his return. The entire matter was immediately explained to Sr. Don Silverio Camposeco, Receiver of Customs for the district, who was authorized by the permission to oversee and report on our work, and to inspect our baggage on departure. He had at that time (about May 15) been visiting Piedras Negras for several weeks, and was fully cognizant, in an unofficial capacity, with all our field work. He was given a copy of the letter No. 002355, undertook to discharge the duties placed upon him by it, and left the same day for his home at Desempeño, three hours by mule from Piedras Negras, promising to return shortly. The men, from the time of our return from Yaxchilan, were kept busy clearing bush, preparing buildings for photography, and assisting the field director in making surveys and surface studies.

The Receiver of Customs did not, in fact, return again to Piedras Negras, until two days before we left. He was prevented

from doing so by illness, as I was informed on several occasions when I sent word to him at Desempeno.

Nevertheless, on his return on July 1st, he was in a position to learn of our activities, since he knew our remaining workmen and our two cooks, and his daughter had remained at Piedras Negras during the whole time, in order to avail herself of our medicines, which at all times are dispensed without charge to the inhabitants of the district.

He (the Customs Inspector) checked all objects which had been found at Piedras Negras or presented to us with a list showing the catalogue number of each, and personally saw them packed, and sealed the boxes. These were left in the camp laboratory under the care of our permanent caretaker, with instructions to let no one open or disturb them, unless on governmental authority. The Customs officer also inspected our baggage so that he could report that no objects were taken away, sealed them, and personally watched us depart. All of this was done in accordance with the requirements of the letter No. 002355 from the Department of Public Education. A copy of the "Acta" or report which he was about to make to that department, which he wrote out and desired me to reduce to typewritten form for him, and which he thereupon signed and requested the field director also to sign, is attached hereto. As part of that document there is a certified list of all objects encountered or presented to us, with their catalogue numbers.

The requirements imposed by the Department of Education have thus been scrupulously fulfilled, with the single exception that before we understood that we would not be permitted to seek the outlines of buildings by partially removing the fallen debris which hid them, this was done in three mounds. The Department should be assured that this was done without any intention of exceeding our authority, that the interests of the government and of science were as carefully looked to as if a regular government inspector had been present, and that in future we shall take care to have arrangements concluded at an earlier date. It might be well to point out that we were so late in our request this year because, up to the last minute, we hoped to have sufficient funds available to be able to ask them to send a special inspector and to carry out a normal program.

Specific Results.

During the initial period of a little over two weeks, we made the superficial excavations above referred to. These were in the Northeast Section, thus for the first time extending our operations north and east of the principal ceremonial groups of the city. The three mounds selected were Structures F-3, F-4 and J-29. These are among the four or five mounds of this area which give evidence on mere inspection of having been roofed with the masonry vault or "Maya Arch", the history of which is one of our principal objectives. Since the first two are in the "House-mound" area, which seems to be characterized by the almost complete absence of vaulted structures, their investigation took on added interest. Could we,

of Piedras Negras

or could we not, say that here, the more permanent and impressive masonry vault was confined to temples and so-called palaces?

Structure F-3 The fallen debris which buried this small building, set on a low platform, was cut by a trench from front to rear, at the center, about one meter wide. This revealed the floor and walls along this line, and, combining this information with a careful survey of the other parts of the mound, enabled us to draw the complete plan with reasonable accuracy. For the extent and nature of this trench see photographs Nos. 2 and 4.

The building was without question roofed with the masonry vault. This confirmed our prognostications from surface examination only, a matter of considerable satisfaction, since it is important to develop reliable criteria from which we can recognize the presence or absence of fallen vaults without excavation. It will never be practicable to excavate all the mounds in a large Maya center (though we hope to do so here). Yet it will be necessary to know the distribution of vaulted buildings in a large number of cities before the history of this major engineering achievement of the Maya can be told. Also in many cases, knowledge of the nature of the roof structure promises to be of value in assigning particular structures to particular time periods.

This is the first vaulted building yet proved to exist outside the great ceremonial areas, as it is, the first small structure on a low platform known to have had this type of roof. Its position poses the possibility that vaults were to some extent used for dwelling houses. This in turn makes its relative dating of great importance.

We are trying to establish the proposition that the vaulted buildings at Piedras Negras became progressively lighter as time went on - that is, their walls were made thinner and their rooms wider. We measure the degree of "lightness" by determining the ratio of the outer wall thickness to the width of the room served by that wall. The resulting index states, in per centage, how much less the wall thickness is than the room width. A high per centage means thick heavy walls or narrow rooms (usually both) while a low percentage or index means thin walls or wide rooms (generally both).

The wall-span index for this building is one of the lightest at the city, and the lightest for buildings of this particular class, indicating, according to our hypothesis, a relatively late date. This is in harmony with the apparent rarity of vaulted buildings among the supposed residential structures surrounding the ceremonial centers. One is led to suspect, and to set up the hypothesis for future tests, that only toward the close of the city's history were its resources such as to permit the extension of the vaulted roof (the most costly in labor and materials) to buildings of minor importance.

On the floor was found a small plain cylinder of limestone. Stones entirely similar (except that this one showed traces of red paint on the sides) have heretofore been found only in buried positions

at the feet of stelae and under temple floors. This piece, combined with another found later on the floor of the nearby Structure F-4, enables us with some assurance to assign the probable original function of all as small altars of a portable nature. If this and the next structure were dwelling houses (of priests or nobles) we may reasonably suspect that ~~in them~~ religious devotions of a private or family nature were part of Old Empire life, at least among the upper classes. It is interesting to note that household altars are still common in the district. We should be able to establish whether or not they had their beginning with the coming of Christianity by the extensive investigation of house-mounds, which has only been begun. This stone was removed to the laboratory and catalogued in order to preserve the red color on its sides.

Ten broken fragments of pottery, of several classes, were found in the debris. They indicate the probable existence of the types at the time of building's erection. No other objects were encountered, as was expected in this type of excavation.

Structure F-4 This is a small mound on the same court as F-3, though facing toward the main plaza of the Northeast Section. The fallen debris was trenched on the center line, as with Structure F-3, and then since a plan hitherto unknown at this site, and rare in the Maya area generally, was indicated, the fallen debris was removed from the inside of the right half. Again, sufficient was done to make the drawing of a complete plan possible.

The building was vaulted, and our remarks as to the vaulted nature of Structure F-3 apply with equal force to this building, with this further remarks: the wall-span index is by far the lightest yet found at the city for this class of structure (that is, a free-standing single range of rooms) and next to the lightest of all vaulted buildings, of every class, at the city. A late date is indicated, provided this method of dating finally gains acceptance.

The unusual plan involves a central chamber, with doorways leading to chambers at either side. The partitions are so staggered as to suggest a conscious plan to use them for maximum reinforcement of the vault, a practice fairly common at Yaxchilan, but unknown heretofore at Piedras Negras. The uniqueness of the plan tends to confirm the late date, assigned on the basis of the wall-span index.

The rooms are nearly square, and the end ones were well lighted, with cross-ventilation through two doorways each, in addition to the communications with the central room. Combining this superior lighting and ventilation with the building's position on a low platform in a house-mound area, we may tentatively conclude that we are dealing with a dwelling of a superior class, though hardly comparable with the great so-called palaces.

The central room was equipped with a plain portable altar, similar to that of Structure F-3, but without remaining traces of color. It was not attached to the floor, but we left it in position, behind the center of the front doorway, close to the rear wall. It is possible that this central room was a species of private chapel serving dwelling rooms on either side. The thought gains a little weight from the fact that the facade was probably decorated with stucco reliefs, like the more pretentious buildings of the ceremonial centers. It is of course

possible that the building was a temple of minor importance. We shall not be able to speak with assurance about the functions of many types of buildings until all mounds at type cities such as this have been investigated, and all lines of evidence correlated.

The only objects recovered were scattered potsherds (representing types in existence when the structure was built, in all probability), a small stone tool (possibly a hammer) and fragments of stucco ornaments which probably adorned the facade. Some of these carried traces of color. The catalogue numbers of objects from this operation are NE-3-1 to NE-3-9.

Structure J-29 This is a "false" pyramid, of major proportions, built against the back of the Acropolis hill, facing Structures F-3 and F-4. It is the only one of its type outside the main ceremonial groups, and the last to be investigated, and was therefore of considerable importance, and its investigation a necessary step in the collection of material for a complete account of Piedras Negras temples. We expected something very different from what we found, so that, as in the case of Structure F-4, our exploratory center trench was extended to include the removal of fallen debris from the left half of the chamber, and from the front portion of the left outer wall. See photographs Nos. 34-30 and 34-64. The right half may be assumed to be symmetrical with the known left and we were able to reconstruct the entire plan with assurance that it is, in essentials at least, correct.

Reasoning from our knowledge of all other pyramid temples of the city, and the distribution of their various types, we had concluded that this one must be vaulted, although the shape and extent of the mound was far from what we thought it should be in such a case. Our investigation proved that it was indeed a vaulted temple, and that a unique plan accounted for the deceptive appearance of the mound of debris. Our criteria for recognizing fallen vaults - the depth of debris, the presence of quantities of large slabs and mortar directly on the floor, the presence of specialized cap-stones, the slope of the debris surface away from the rear wall of a front room - all held good. Our doubt as to roof-type on preliminary surface examination had resulted from ignorance of the existence of a temple type in which a front vaulted chamber is backed by a solid mass which cannot collapse. We had looked for the chamber in the wrong place. The work on this structure thus warns us to be cautious in dealing with unfamiliar types of mounds, but at the same time puts a new type into the category of known types.

Although this temple falls in the vaulted period of temple construction, contrary to expectations its vault-span index indicates an early part of that period for its construction. The index is the heaviest yet found at Piedras Negras. We are led to set up the hypothesis that the masonry vault was first here used with the intention of expanding the principal ceremonial areas to include the Northeast Section and that this intention was given up in favor of rebuilding the older groups, giving them the more modern buildings. This process, we think, changed the whole complexion of the West and East Groups, and had just begun to modernize the South Group. Apparently, apart from this temple and the great stairway next it, the Northeast Section was allowed to remain a residential area.

That this building is one of the earliest, if not the earliest, vaulted

building of the city. ~~This~~ is to some extent confirmed by the presence of the column altar, found in this case in position in a niche in the rear wall of the chamber. This type of altar has been found in all non-vaulted temples, two of them at buried levels, and in the vaulted temple Structure K-5-1st, the later being associated with dated stelae and a so-called lintel. Similarities in the plans of the chamber of that temple and of this link them together as probably belonging to the ~~yearly~~ early part of our supposed vaulted period which, on the basis of the K-5 dates and the heavy index of this similar chamber, probably began long after the city had been founded and grown to some importance with perishable material roofs. We had come to this tentative conclusion a year ago. This operation strengthens the hypothesis.

The building gives us two details of plan which are of considerable importance, since they are unique in the region, and perhaps in the Maya area as now known.

a. Although the building is deep enough to allow for two chambers, one behind the other, there is but one chamber, at the front. Behind is a solid mass, which we have reason to believe was originally constructed as such, and is not a rear room subsequently filled up.

b. From the back and top of the altar niche (itself an uncommon feature) a long flue, led passing through the solid rear mass, led to the open air at the rear of the building, rising as much as it could without coming out above the medial cornice. Position and smoke stains leave no doubt that this somewhat elaborate arrangement was intended as a ventilator to carry off the smoke from the altar fire in the niche. A subsequent modification of the niche may have been intended to make this chimney arrangement draw better, and some knowledge of the principles of a good fireplace may have been involved.

Besides the usual scattered potsherds and a figurine head or two, two finds of considerable scientific importance were made, though their destroyed condition gives but a feeble idea of their former artistic value.

a. The first is six fragments of a badly eroded sculptured slab, which had been broken up and used as mere building stone when the temple was erected. The temple must therefore have been built after the stone was destroyed. Here we have additional evidence that although the building involves the heaviest and structurally most primitive stone vault known from this site, it can hardly have been one of the earliest temples built. There must have been a period during which the stone was carved, used, destroyed and reused as building material. It is extremely unfortunate that the long inscription is illegible, as it would be first-rate evidence for an approximate dating of the introduction of the vaulting technic. It is hoped that we may yet gain some knowledge of the date of this stone on stylistic comparisons.

This piece is important in another respect. Remaining red color and an ornamental groove running along the top and end edges prove that it was not designed as a door lintel, but was in all probability a vertical panel, designed to be let into the wall of some building or other structure. This gives us a definite clue as to the real

nature of eleven of the thirteen carved ~~sibs~~ slabs which have been put down as lintels but which, for a number of reasons, have been under suspicion for some time. This is the first of this class of stone which shows that it could not have been a lintel, and shows so many similarities to the others as to make almost certain our deductions as to them. The catalogue number of this piece is NE-4-13. See photographs Nos. 34-70 to 34-75.

The elimination of Piedras Negras as a city where the carving of stone lintels was practiced to any extent throws the nearby site of Yaxchilan into sharp relief. Indeed it leaves that city, with fifty-five known examples, the only city in the whole Maya area, so far as ~~now~~ known, where more than a minor ~~and~~ sporadic use of this structural member ~~for~~ as a field for artistic embellishment is indicated. Some day this fact must be explained. Indirectly this stone, wholly destroyed in Maya times, serves further to show that the cities of the Usumacinta region, contemporary and doubtless in close communication, were astonishingly independent of each other in many ways.

Specifically uninteresting finds such as this will eventually form a firm basis for deductions as to political organization, degree of artistic freedom, and so forth, ~~xxxx~~ among the Old Empire Maya. It is to this important class of knowledge that archeology, according to a common view, can contribute little. The complete investigations of type cities, on one of which your expeditions are now engaged, should form a fair test of this view. We can report that ~~already~~ we have a considerable body of evidence that, while using common fundamental concepts, methods and materials, the architects and artists of the three neighboring cities of Palenque, Yaxchilan and Piedras Negras were remarkably independent of each other in the manner in which they used their common heritage. Since this independence extends to the fundamental plans of temples, and since sculptural art was obviously the handmaiden of religion, a like degree of independence among the directing local priesthoods may be inferred.

b. A second find, again of little remaining (though originally great) aesthetic value, adds to our knowledge of stucco modeling at Piedras Negras. Data on this is scarce because of the perishable nature of the stucco. In the debris covering the temple chamber (but not outside) were recovered part of the forehead and one eye of a more than life size head, an ear plug, a rosette and two delicately modeled fingers, all to the same large scale. With little doubt, these come from a figure broken up before or at the time of the erection of the building, and were thrown in the masonry of the roof. Like the stone slab, they probably date back to a pre-vault period in the history of the city.

This is the first evidence that large sized stucco heads (of which two, likewise broken up, have been found in former years) come from formerly complete, or partially complete, bodies. It is the first to show grotesque features. In this case there were huge bulging eyes and a broad flattened nose-root. It is, possibly, from a figure (idol?) of the rain-god.

The quality of the modeling is very fine, giving us a third example to prove that stucco modeling in this region was the equal of stone carving. As in the other cases, all parts recovered had been smeared

roughly with a thick coating of white plaster, completely obliterating the beauty of the piece. The meaning of this remains to be elucidated. There is no doubt that it occurred during the occupation of the city by the classic Maya, and not during a later occupation by peoples lacking their ~~xx~~ feeling for beauty. The other two examples came from below the floors of temples, this probably from below the surface of the roof. Possibly figures from obsolete temples were broken up and deposited in the masonry of new ones in order to transfer or instill some transcendental virtue in the new building, and the smearing may have been part of the ceremony. Such a use recalls the broken fragments of old stelae in the foundations for later ones at Copan.

Certain types of potsherds, found in the debris over the chamber floor, probably come from the same source, and the existence of the types before the building of this temple may be postulated. Sherds, stucco fragments, fragments of four figurines and the carved panel fragments were catalogued (Nos. NE-4-1 to NE-4-13) and left in the camp laboratory, sealed by the Customs Officer.

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The above account covers fully the only three operations in which excavations of any sort were made. On our return from Yaxchilan about two weeks were devoted to drawing the plans and sections and analysing the results of ~~the operations~~ those operations. In addition, during this period a large area of bush was cleared around Structures F-2 to F-4, and from the J-29 pyramid, and a surface study made of the later, with an accurately measured and leveled cross-section. The major features of its design were made out, without excavation. After letting three of our men go, we transferred our studies to the East, South Groups, and the Southeast Section.

Structure P-7: From this time on, most of our attention was devoted to Structure P-7, which was partially excavated by Dr. Mason in 1931, our first season. It was felt that this building, which in plan is absolutely unique in the Maya area, was of major importance because there seemed little doubt that the roof was a combination of masonry vaulting with a flat beam-and-concrete roof. Such a combination is of great interest for the history of Maya architecture, and has heretofore been unknown. In addition, the flat concrete roof has not been reported, even when used alone, from the Old Empire area, and may be supposed to have been originated in the arid highlands outside the Maya country. It was felt that in laying before our colleagues the evidence for such unexpected features we should have a new and more complete set of drawings, including especially careful cross-sections at many points, combined with a careful study of the fallen debris, and a search for anything else which might have a bearing on the roof construction. In other words, to apply to this building what we had learned since 1931 in regard to fallen vaults. The drawings and observations were carefully made, and while the results have not as yet been submitted to Dr. Mason, they will, the writer believes, assist him materially in sustaining his interpretation of this remarkable building. While considerable bush clearing in neighboring areas went forward, most of the writer's time was devoted to this structure during a period of nearly three weeks.

Miscellaneous. The remaining time was devoted to checking up various

measurements and observations of other years, notably among the Acropolis structures and the important pyramid temples K-5-1st and O-12; and in making surface studies and surveys of about a dozen mounds in the South Group and the Southeast Section. Results here were especially gratifying, as we were able to establish, without excavation but beyond question, the presence of two non-vaulted long galleries or "palaces". Only one of these was hitherto known, and was of the same somewhat complex plan as the vaulted Acropolis palaces, and was placed among them. ~~It~~

The new palaces - Structures S-17 and S-18 - are of simple plan, without rear or end rooms. Their type, position and mere existence strengthens materially our theory that the surface buildings in the southern part of the city are hold-overs from an early period when the famous Maya vault was, for this city, a thing of the future.

Reasons for supposing all the vaulted temples of the city to belong to a relatively late period of its history have been lightly touched upon above. While we need further work to be sure, we are now in a position to set up a hypothetical but logical outline for the history of the Piedras Negras palaces as well: our knowledge begins with a single long open gallery, non-vaulted (Structures S-17 and S-18); next, the gallery is doubled (one at front and rear, separated by a medial wall) and end rooms are added. This development took place on the Acropolis long after the founding of the city, as we know from stratigraphic excavations there. Possibly there are missing steps between, and even if not, the passage of time is implied. The roof is still non-vaulted (Structure J-12). After this, the fundamental palace plan remained unchanged for free-standing palaces, but the roofs were vaulted (the seven vaulted palaces of the Acropolis). A subtype (possibly not new), the "built-on" palace adapted itself to the Acropolis terrain. From the point of view of use, this was essentially the same as the simple non-vaulted galleries found this year. Yet one was built to house a late monument (Room 1 of Str. J-6, enclosing Throne 1). The long open gallery persists throughout, so that a common function may be assumed for all. While among these vaulted palaces the plan remains essentially constant, there are minor differences, and the vault-span indices indicate a progressive mastery of engineering technic, which again implies time. Our surface studies have thus aided us in bringing the palaces into line with the temples, giving us valuable support to the thesis that the architectural history of the city comprises two major periods - the first in which the Maya vault was not used at all, and the second in which it was at least the rule for important buildings.

Whether during our postulated pre-vault period the vault was known, but beyond the abilities or resources of this particular city, can be determined only when type sites from all sub-areas are well known.

Our belief that nearly all the buildings of the South Group and Southeast section were non-vaulted (in sharp contrast to the West and East Groups) was greatly strengthened by careful observations and measurements on the surface of the important structures O-2, and of Structures S-5, S-6, S-7, S-8, S-9, S-10, S-11, S-12, S-13 and S-16. A similar study was made of the important mound P-6. In all of these cases we were able to say that there is practically no doubt that the vaulted roof was absent. In addition, in Structure S-19, we added one more to the known examples

of a special class of small buildings, probably temples, which are placed on low platforms, have very low and narrow single front doorways, which are bridged with massive unsculptured lintels. Some of these were probably vaulted and others probably not. This point must be finally determined by excavation, as complicating factors such as depressed passages, and relatively large interior constructions are known to occur in some of them. Their investigation is all that remains to be accomplished before we will be in a position to give a fairly complete account of ~~the~~ all the clearly ceremonial buildings (i.e. temples) of the city. The heavy lintel confirms further our deductions as to the dimensions in vogue for this structural member, and adds another bit of evidence that most of the so-called carved lintels of the city were in fact something else.

In this class of work, of course no objects whatever were encountered, as the area had been previously examined superficially for map-making purposes, and the vegetation was not thoroughly removed. However, we were able to make a splendid addition to our important collection of figurines, which, with a few other objects, were picked up in neighboring districts, or close at hand, and presented to us, by friends of the expedition. For most of these we are indebted to Sr. Rufino Ramos, one of our workmen, who found them while preparing his nearby cornfield. The catalogue numbers of these gifts are M-23-1 to M-23-21; M-24-1 to M-24-2; and M-25-1.

During the course of the season, for most operations field sketches were worked up into careful drawings to scale, a practice which greatly minimizes the chance of error and omission, a fact which was made apparent again and again. Objects were cleaned, catalogued, drawn and safely deposited in boxes sealed by the Customs Receiver. A total of one hundred and ninety-six photographs were made and developed on the spot, and eighty-six more, taken elsewhere, especially at Yaxchilan, were there developed.

Respectfully submitted,

Arden Satterthwaite
Field Director.

FOURTH EXPEDITION TO PIEDRAS NEGRAS, 1934.

Summary Report on the Results of
Surface Examinations at Yaxchilan, Chiapas, Mexico,
and at Neighboring Sites.

(See separate memorandum on the work at Piedras Negras).

The staff, consisting only of the field director and Mrs. Satterthwaite, together with a cook and three of our four workmen, left Piedras Negras May 1, arriving at the end of four days travel by river at the large and important ruined city of Yaxchilan, on May 4. Here we worked until May 12, leaving Yaxchilan early in the morning of May 13, arriving at Piedras Negras in the evening of May 14, after making certain rapid examinations of sites on the way down.

Yaxchilan

Our principal objective in making this hasty side-trip was to study and especially measure the many standing or partially standing buildings there with a view to testing our method of dating by wall-thickness--span ratios, at another site. The principle underlying this method, and the manner of arriving at indices by which the degree of "lightness" of one building is compared with another, is briefly set forth in the report on the work at Piedras Negras. We worked at Yaxchilan under special permission from el Sr. Dr. Jose Roygadas Vertiz, Chief of the Department of Monuments of the Mexican Government, to whom the museum's thanks are due. Unfortunately, the Department did not feel justified in allowing us permission to make such minor excavations as in many cases are necessary to determine the thicknesses of walls, and widths of rooms. For this reason, measurements on many buildings are incomplete. We were, however, able to secure enough to convince us of the essential validity of the method, and to lead us to believe that with permission at some future date to clear debris sufficiently to determine the thicknesses of all walls, and the widths of all rooms, we will be able to assign most of the vaulted buildings of the city to specific time periods.

Partial or complete measurements of the all-important wall thicknesses and room widths (spans) were obtained for the following buildings:

Buildings with two or more parallel vaults

<u>Structure No.</u>	<u>Index</u>	
	<u>Front</u>	<u>Rear</u>
6	54	53
25	69	?
30	66	?
7	54	53
23	?	51
10B.....	34	52
11	?	?
12	24	50
45	35?	?

Buildings with one vault, and with partitions

<u>Structure No.</u>	<u>Index</u>	
	<u>Front</u>	<u>Rear</u>
40.....	59	?
20.....	52	52
33.....	42	?
44.....	35	?
42.....	35?	?

Buildings with one vault and with buttresses.

<u>Structure No.</u>	<u>Index</u>	
	<u>Front</u>	<u>Rear</u>
39	60	60
10A.....	29	31
10C.....	27	27

Buildings with one vault, apparently without buttresses

<u>Structure No.</u>	<u>Index</u>	
	<u>Front</u>	<u>Rear</u>
22.....	50	51
26.....	46	?
?.....	31	?

(Building of Lintel 55).

We thus obtained information, though incomplete in a number of cases, on twenty of the vaulted buildings at Yaxchilan. The indices given are obtained by dividing the front and rear walls by the front and rear room widths, respectively. There are probably not more than a half-dozen other vaulted buildings in the main ceremonial groups of the city, so that with a very small amount of removal of debris, it would be possible to complete our measurements, not only where still needed in the above buildings, but in the others, so that we would have a complete set of cross-section measurements and the indices which can be calculated from them, for all of the principal groups at Yaxchilan.

Until such a complete set of measurements is available, final conclusions cannot safely be drawn. Furthermore, the application of this method at Yaxchilan must be made with greater caution than at Piedras Negras, because of the presence at the Chiapas site of complicating features such as transverse partitions and interior buttresses which in many cases helped to support the vault, and may have affected the wall-span ratio.

However, a beginning at interpretation, within sub-groups of buildings having extra features such as this in common, or being set apart by their absence, has been made. In particular we have been able to make out a fair presumptive case that the relative dating of two of the three units called Structure 10 by Maler, should be reversed--that is, the part considered later by him is earlier. Since the part indicated as later by the indices carries a late date (A.17.0.0.0) on its lintels, we have here a partial confirmation of our method.

Applying the method to Str. 12, a late date in the vault-building period of the city is plainly indicated. A study of the interior construction of the walls of this and another similar building reveals a thin but definite concrete hearting, a technique unknown at Piedras Negras and probably at Palenque, the two other important Usumacinta region cities, and apparently very rare at Yaxchilan. This technique is an advanced and sophisticated one, and may be the precursor of the concrete walls of the "New Empire" in northern Yucatan. Occurring as it does in these two similar buildings, which are unique in plan also, this technique, until we have definite evidence to the contrary, should be considered a relatively late development. The validity of the method is thus confirmed from another point of view. On the other hand, Dr. Morley considers the carved lintels of this building to be early. Whether the two methods of relative dating can be reconciled or not remains to be seen. The present disagreement is in no sense unfortunate, but a healthy condition for research in a practically unknown field such as this region of the Maya area. It will stimulate the search for other evidence, and reexamination of what is in hand, and eventually place research on architectural development, or the evolution of glyph styles, perhaps both, on firmer foundations.

The indices, which we were able to get vary from 69 per cent down to 24 per cent, while those at Piedras Negras range from 74 to 18 per cent, and approximate correspondence. However, the Yaxchilan buildings with the heavier construction (higher index) may well have been made so for reasons not operative at Piedras Negras, such as very high vaults, and heavy ornamental masonry constructions on the roof, and so be contemporary with some of the lighter buildings at Piedras Negras. Assuming the chronological significance of the indices, when properly discounted for external factors--that is, factors other than actual ability to erect vaulted buildings of a given degree of lightness at a given time--the evidence as it stands suggests that vault-buildings began at Piedras Negras before it did at Yaxchilan. Should we be able in the future to establish such a point, we would have made a stride toward deducing the directions in which the art of vault-building spread in Old Empire regions. When that is known we shall know where to look for its origin.

The evidence at Piedras Negras points strongly to an early period when the city flourished, but either did not know, or did not use, the masonry vault to roof its buildings. This made it important to know whether the same was true of the other cities of the region. This cannot be definitely determined without a major program of excavation and study, in the case of Yaxchilan, but a beginning can be, and was, made from surface examination. Valuable, though inconclusive evidence on this point was secured by finding at Yaxchilan, as at Piedras Negras, a fair scattering of mounds within the great ceremonial areas, which did not support vaulted buildings. The theory, of course, is that these are hold-overs from a pre-vault period, which had not been replaced with the more modern structures when the city came to an end. Using methods worked out at Piedras Negras, we were able to satisfy ourselves that the following mounds are the ruins of non-vaulted structures: Strs. 4, 5, 8, 15, 18, and 51. All of these except Str. 18, a pyramid, closely adjoin vaulted buildings, and all are placed in important positions. Our determinations of the non-vaulted character of these ruins should of course, be verified by minor excavations. The clearing of debris from the floor on a line from front to rear (the work of an hour or two in this class of structure) would settle the

question. However, we have confidence in these surface determinations as they stand, and the theory that Yaxchilan passed through an early non-vaulted period may be said to have passed the first test.

We were able to add considerably to our earlier series of measurements of stone lintels and of doorways. The conclusion seems inescapable that, with the rarest of exceptions, stone lintels are heavy and not light slabs, and they are long enough to project well into the jambs on either side of the doorway. This knowledge is of great use in determining (as we think we have successfully done) that nearly all of the supposed carved lintels of Piedras Negras were in fact vertical panels.

A comparison of doorway widths at the two cities shows an almost universal preference at Yaxchilan for narrow doorways, almost always surmounted by stone lintels. At Piedras Negras, wooden lintels over wide doorways were the rule, except for a special class of small buildings. The result was darker and less well-ventilated rooms at Yaxchilan. Apparently the Yaxchilan architects preferred to stick to the stone lintel, which is unsuited to wide doorways, at the sacrifice of some light and air. These remarks apply only to the vaulted buildings at Yaxchilan, since the plans of buildings with roofs supported on perishable materials (timbers) cannot be worked out with excavation.

We were able to measure the depth of fallen debris in a number of buildings where unfallen portions give us full information on just what has fallen. This is a valuable check on methods used in determining former presence or absence of vaults in completely fallen buildings. Incidentally, the depth of debris where the vaults are known to have been high greatly exceeds anything at Piedras Negras except Structure O-13. It appears probable that we shall be able to say with assurance by comparisons of debris depths in certain buildings at each city, that none of the Piedras Negras buildings, except O-13, had high vaults, an important thing to know both from the point of view of engineering knowledge, and actual esthetic effect.

A good many valuable observations were made regarding building techniques, touching the structural function of cap-stones, molding courses, roofing surfaces, and so on, some of which very probably duplicate observations, as yet unpublished, by the Carnegie Institution Expedition of 1931. In general, however, our investigations were designed to avoid such duplication of effort, and with this in mind, little attention was paid to ornament, molding and facade design, and so on.

In respect to the splendid stone sculptures of Yaxchilan, we paid no attention to them except for two pieces discovered by the local caretaker since the Carnegie Institution covered this field. A new carved lintel, found by the caretaker, Sr. Ulises de la Cruz, and seen by us in 1933, was this year photographed (Num. 34-237) by artificial light. The view is far from satisfactory, but a good picture cannot be made without moving the lintel (which has not entirely fallen), or in lieu of this, clearing the debris in the doorway so that a camera can be set up directly under it, and at a reasonable distance below it. This carving is of great interest since it is in a building far removed from the known area heretofore investigated. It is close to the river bank, a kilometer or more up-stream from the up-stream (southeasterly) limit of the area mapped by the Carnegie party.

A very interesting sculptured fragment was found on the surface of a

low non-vaulted mound close to Structure 2 and 3. Sr. de la Cruz, while locating these two mounds for us, stumbled on a metate which, on being turned over, was found to be a re-used sculptured fragment of great interest. This is shown in Photos. Num. 34-228 to 34-239, and by a drawing in 34-240. Because of the thinness of the slab, the writer believes that it is not a portion of a lintel. It may easily be part of a vertical panel such as we believe the famous so-called lintels of Piedras Negras to have been. The thickness is only 12.5 cms.

Sr. de la Cruz, the government caretaker, has made an interesting collection of surface finds, to which this was immediately added. These include an entirely different type of small metate, found also at Piedras Negras, mano stones or grinders, clay figures, whistles, pottery fragments, stone tools, etc., which were drawn and photographed. These are shown in Photos. Nums. 34-242 to 244.

Sr. de la Cruz was tireless in his zeal to lead us to the various buildings, at our own convenience rather than his, and was kindness itself in aiding us to make our temporary quarters as comfortable as possible. While our own men were sufficient to do the bush clearing desired, he made it plain that he would gladly put his own helpers at work on the particular mounds which we wanted to examine.

The museum's thanks are due to el Sr. Dr. José Reygadas Vértiz, and our other friends in the department which he heads, for the government's permission to prosecute the investigations outlined. While our results would have been more complete and valuable had we been allowed to make superficial excavations as requested, the refusal on this point was entirely reasonable.

It is not possible to fully instruct a resident caretaker who is not an archaeologist as to the extent of permitted excavations, and if a special government representative cannot be afforded, the government bureau concerned must rely largely on the skill and probity of the petitioner. An affirmative reply to such a request requires, as was said, careful study and consideration, for which there was not time.

Miscellaneous Sites.

A hitherto unknown archaeological site was reported to us to exist on the east shore of a small lake called "Encajonado del Salvamento", probably not more than two or three leagues from Yaxchilan, but on the Guatemalan side of the river. The lake is close to the river but separated from it by a precipitous hill. On our return journey our party was halted for forty-five minutes while the writer followed our informant, Gaspar de la Cruz, to the lake. Time was lacking to skirt the lake and actually reach the ruins, but with the position of the lake known, they can be found in the future. Standing walls are reported there. Here, as for the entire route, a sketch-map was made, with frequent compass bearings and time notes, as an aid to locating points of interest. The name of this lake is somewhat misleading, as it is just below "La Garganta", which is at the base of the great loop or meander of the Usumacinta which serves so well to locate Yaxchilan.

Just below Salvamento another site was reported by our boatmen, called "Burelo". Here we spent about three hours searching in the bush. We were able to locate two small mounds on the top of a high hill, and a metate of the usual type proved former occupation here, but we were unable, in the time

available, to find the larger mounds supposed to exist here. This site is also on the Guatemalan side of the river.

We paused long enough to examine hurriedly the site called "El Chile" and described briefly by Maler. The ruins here appear to be quite extensive, and should be further investigated. Careful notes were made with a view to locating this site in future. Although the general location of a site is known, much time can be lost in actually reaching it unless one's guide happens to know the precise spot.

After spending the night at Desempeno, Mrs. Satterthwaite proceeded to Piedras Negras to put the camp in readiness for our return, while the writer went up-stream with the other canoe to investigate another new site across the river from Maler's "El Cayo". Sr. Don Silverio Camoseco brought this place to our notice and provided us with a guide. He reports standing walls and remains of vaults there, which we did not find, probably for lack of time. We did find the site however, and it may prove of great interest. We examined an acropolis which is unusual in three respects, apart from its extreme height and steepness. Its terrace retaining walls are well built of unusually large stones. The end of the upper one is curved to form a semi-circle. The buildings on it appear from surface examination to have been all non-vaulted, and this is also true of an extensive area below.

An interesting circumstance here is the presence of many large fissures in the bed rock, with caves, one of which seemed to have been artificially plastered. The site has been named "El Cayo II".

An effort to locate the two curved stones, called lintels by Maler, and found by him at El Cayo, almost directly opposite on the Chiapas (Mexican) side of the river, failed. These have been moved close to the river bank since Maler's time, and judging by information secured after we had left, can still be located.

At Las Escondidas, opposite Desempeno, we were kindly permitted to photograph a complete tripod bowl, and a bark boater, found by woodcutters at the new Chiapas site said to be two or three kilometers from "Samaneo", which is a new monteria or camp about two leagues inland, and about opposite Piedras Negras. We did not visit this site for lack of time, intending to go to it later by the more direct route from Pervenir, just below Piedras Negras. Later on, high water prevented the crossing at that point.

Brief visits should be made to both El Cayo II and Samaneo in future years, as each can be reached in one day from our camp.

It becomes increasingly apparent that the principal known cities of the Usumacinta valley--Yaxchilan, Palenque, and Piedras Negras--are by no means isolated centers, but that the whole terrain is dotted with archaeological sites, some of which may be of considerable size. The possible implications are very interesting. If they were all more or less contemporary, there must have been a dense population in a semi-mountainous district, probably dependent in part on imported food. If not, the history of the Maya in this district probably goes back well beyond the classical period, notwithstanding the absence of surviving very early dated monuments.

A total of eighty-two photographic exposures were made on this two-weeks excursion, of which fifty-two are of archaeological interest. The catalogue numbers of the latter are 34-197 to 34-248. The others, river-scenes, modern houses and people, have not been as yet printed.

Respectfully submitted,

Linton Satterthwaite, Jr.

1934

Copy, not
corrected, of
translation sent
to Guatemala.

CUARTA EXPEDICION A PIEDRAS NEGRAS

1934

Resumen del Reporte de Trabajos en Piedras Negras-Vease

Memorandum Separado Sobre Trabajo en Yaxchilan.

En vista del reducido presupuesto para este año la Secretaría de Instrucción Pública del Gobierno de Guatemala, en un contrato bajo cuyas bases trabajamos en Piedras Negras, muy bondadosamente dispuso la interpretación literal de la cláusula de dicho contrato requiriendo el que empleásemos un inspector especial enviado por dicho departamento. Por esta razón, no se sometieron reportes a dicho departamento mientras estuvimos en el lugar; y este resumen servirá, quizás, como base para un reporte para esa rama del Gobierno Guatemalteco.

Notas Generales

El cuerpo de oficialidad consistió solamente del Director de Operaciones en el terreno, y de la Sra. Satterthwaite quien, como de costumbre, actuaba como asistente de laboratorio, tenedor de libros, se ocupaba de los quehaceres de casa y del catálogo. Además, este año, ayudo en el desarrollo de películas. Salimos de Philadelphia el 20 de marzo de 1934, y procedimos por agua hasta Tenosique, via Vera Cruz y Alvaro Obregon, llegamos a Piedras Negras el 9 de abril. El trabajo actual en el terreno con cuatro hombres, empezó el 13 de abril y continuó hasta el 1 de mayo, en cuya fecha salimos para Yaxchilan, lugar importante río arriba en el lado mejicano. Relacion de nuestras actividades allí ha sido dada en reporte separado. Retornando el 14 de mayo continuamos nuestro trabajo en Piedras Negras con cuatro hombres hasta el 2 de junio, y desde entonces hasta el 2 de julio con un hombre y la ayuda ocasional de otro. Salimos del campamento el 3 de julio, volviendo a Alvaro Obregon por agua, hasta Philadelphia, llegando el 13 de julio.

Nuestro trabajo, esta ocasión, fue llevado a cabo bajo el permiso especial del Departamento de Instrucción Pública Guatemalteco, contenido en una carta del Dr. Ramon Calderon, Ministro de Instrucción Pública, al Dr. Mason, fechada el 16 de abril de 1934, conteniendo el número de referencia 002355. Esta carta autorizó al director y a la Sra. Satterthwaite "sin excavar o remover objetos, hacer estudios de la arquitectura de los edificios derrumbados." Desde durante el primer periodo de nuestro trabajo, desde el 13 de abril hasta el 1 de mayo, un poco más de dos semanas, nosotros hicimos trabajos los cuales se pueden llamar excavaciones superficiales, en tres terraplanes, es necesario explicar las circunstancias bajo las cuales esto fue hecho, y una explicación completa debe ser dada al Ministro de Instrucción Pública de Guatemala, Dr. Calderon.

Las referidas trabajos fueron estrictamente superficiales, esto es, nosotros solamente removimos parte de la tierra y piedras caídas que habían cubierto parte de las paredes de los tres edificios en cuestión (Estrucubas F-3,

F-4 y F29) y fueron limitadas a estos tres terraplenes. Nosotros no penetramos suelos, ni cavamos debajo de monumentos ni en lugares supuestos cementerios donde podrian encontrarse objetos de valor. Peticion de permiso para hacer esta clase de excavacion fue implicita en la carta del Dr. Mason al Dr. Calderon fechada el 20 de mayo en la cual el decia, refiriendose a la expedicion, que "no excavaría, a menos que fuera muy poquito para descubrir elementos de arquitectura para estudio" ("En Piedras Negras no excavaría, si no muy poco para descubrir elementos de la arquitectura para estudiarlos.")

Al llegar a Piedras Negras no teniamos contesta a esta peticion del Dr. Mason, aunque el habia sido informado por el Dr. Adrian Recinos, Ministro de Guatemala en Washington de que este habia escrito de su parte a su gobierno con la idea de conceder recomendando la peticion. Como que el trabajo en Piedras Negras se limita estrictamente a la epoca de la seca, la cual estaba ya bien avanzada; y como que habia habido una gran demora el año anterior para traer el inspector donde estabamos nosotros; y como que no habia razon porque anticipar negacion a nuestra peticion por completo, los trabajos dichos fueron hechos antes que la contesta del Dr. Calderon (carta No. 002355) fuese remitida a mí. Ningunas excavaciones ni aun de esta clase menor, fueron hechas despues de dicha contesta fue recibida en el campamento o sea despues del 1 de mayo.

Como en años anteriores, un completo juego de fotografias, en duplicado, ha sido preparado para el Departamento de Instruccion, y se esta haciendo una traduccion del catalogo fotografico. Al recibir estos, el Departamento podra ver con claridad la extension de dichas trabajos, ejecutadas durante la primera parte de nuestra estancia y antes de recibir la carta No. 002355 o noticias de ella fueron recibidas en el campamento. Estas excavaciones estan comprendidas en las siguientes fotografias: Estructura F-3, por los Nos. 34-2 hasta 34-13; Estructura F-4, por los Nos. 34-14 hasta 34-24; Estructura J-29 por Nos. 34-26 hasta 34-30.

El Director de Operaciones desea anunciar que el tomo la decision de ejecutar las mencionadas trabajos con anterioridad a recibir el permiso formal del Departamento de Instruccion bajo su propia responsabilidad, aunque el estaba bajo la impresion equivocada de que este era lo que se esperaba que el hiciera por su jefe el Dr. Mason.

La carta No. 002355 no llevo a Piedras Negras hasta despues que nosotros habiamos partido para Yaxchilan, y fue vista por primera vez por el Director de Operaciones a su vuelta. El asunto entero fue inmediatamente explicado al Sr. Don Silverio Camposeco, Recibidor de Aduanas del distrito, quien estaba autorizado por la carta para vigilar y reportar sobre nuestro trabajo, e inspeccionar nuestro equipaje a nuestra partida. El habia estado en ese tiempo.

(alrededor del 15 de mayo) visitando Piedras Negras por varias semanas, y estaba en completo conocimiento, en capacidad ineffectual, con todas las operaciones en el terreno. A él se le dió una copia de la carta No. 002355, el emprendió a desempeñar las obligaciones que ésta le encomendaba, pero partió el mismo día para su casa en Desempeño, tres horas en mule desde Piedras Negras, prometiendo volver pronto. Los hombres, desde el día de nuestra vuelta de Yaxchilán, fueron ocupados en chapear, preparar edificios para fotografías, y asistir al Director en tomar medidas y hacer estudios de la superficie.

El Recibidor de Aduanas, en efecto, no volvió a Piedras Negras hasta tres días antes de nuestra partida. Esto se le impidió una enfermedad, según se me informó varias veces en que yo envié noticias a él en Desempeño.

No obstante, a su vuelta el 30 de junio, él estaba en posición de saber nuestras actividades, pues él conocía a los trabajadores que quedaban y a nuestros dos cocineros, y su hija quien se había quedado en Piedras Negras durante el tiempo entero, para disfrutar de nuestras medicinas, las cuales son siempre, gratuitamente, distribuidas a los habitantes de este distrito.

Él (el Inspector de Aduanas) comprobó todos los objetos que habían sido encontrados en Piedras Negras, o nos habían sido presentados, con una lista demostrando el número de cada uno en el catálogo, y personalmente los vió embalar, y selló las cajas. Estas fueron dejadas en el laboratorio del campamento al cuidado del encargado permanente, con las instrucciones de no dejar que fuesen tocados por nadie a menos que portase autorización del gobierno. Los oficiales de Aduana inspeccionaron nuestros equipajes para que él pudiera reportar que no fué llevado ningún objeto, sellarlos, personalmente nos vió partir. Todo esto fué hecho de acuerdo con los requerimientos de la carta No. 002355 del Departamento de Instrucción Pública. Una copia del "Acta" que él estaba por hacer para ese departamento, la cual él escribió y deseó que yo se la copiara en la maquina de escribir, y que él después firmó y pidió al Director de Operaciones que firmara, está adjunta. Formando parte de ese documento hay unas listas certificadas de todos los artículos encontrados o que nos fueron regalados, con sus números correspondientes en el catálogo.

Los requerimientos impuestos por el Departamento de Instrucción han sido escrupulosamente cumplidos, con la sola excepción de que antes que nosotros nos diésemos cuenta de que no se nos permitiría remover parcialmente los escombros caídos para descubrir los centros de los edificios, ya habíamos hecho esto en tres terraplenes. El Departamento puede estar seguro de que éste fué hecho sin la intención de prepasar nuestra autoridad, que el interés del gobierno y el de la ciencia fué observado tan cuidadosamente como si un inspector del gobierno hubiese estado presente, y que en el futuro tendremos cuidado de tener terminados los arreglos con anticipación. Sería bueno indicar que nos demoramos tanto en hacer nuestra petición este año porque, hasta última hora, nosotros creímos que tendríamos suficiente fondo para poder haber pedido un inspector especial y haber llevado a cabo un programa normal y completo.

Resultados Específicos

Durante el período oficial de un poco más de dos semanas, hicimos las excavaciones superficiales ya referidas. Estas fueron hechas en la Sección del Norte, extendiendo así por primera vez, nuestras operaciones norte y este de los grupos ceremoniales de la ciudad. Los tres terraplenes elegidos fueron Estructuras F-3, F-4 y J-29. Estas se encuentran entre los cuatro o cinco terraplenes de esta área la cual daba, a mera inspección, la evidencia de haber sido techada con albañilería abovedada o "Arco Maya", la historia del cual es uno de nuestros objetivos principales. Por estar los dos primeros en el área del "Terraplén de Casa", el cual parece estar caracterizado por la casi completa ausencia de estructuras abovedadas, su investigación tomó más interés. ¿Podríamos o no haber dicho nosotros que aquí en Piedras Negras la albañilería de bóveda permanente e impresiva estaba limitada a templos y palacios así llamados?

Estructura F-3 Los escombros caídos los cuales enterraron los edificios pequeños, situados sobre plataformas bajas, fueron cortados por una zanja desde el frente hasta el fondo, en el centro, como un metro de ancho. Esto descubrió el suelo y las paredes a lo largo de estas líneas, y, combinando esta información con cuidadosas medidas de las otras partes del terraplén, nos facilitó el trazar planes completos con razonable exactitud. Para la extensión y naturaleza de esta zanja veanse las fotografías Nos. 2 y 4.

El edificio estaba, sin duda, techado con albañilería de bóveda. Esto confirmó nuestros pronósticos con la excavación superficial solamente; un asunto de considerable satisfacción, por ser importante el desarrollar dependable criterio para del cual poder nosotros reconocer la presencia o ausencia de bóvedas caídas sin excavaciones. No será nunca practicable el excavar todos los terraplenes en un centro Maya (aunque nosotros esperamos hacerlo aquí) No obstante será necesario saber la distribución de los edificios abovedados en un gran número de ciudades antes que la historia de estas grandes obras de ingeniería de los Mayas pueda ser narrada. También en muchos casos, conocimiento de la naturaleza del techo de la estructura promete ser de valor al asignar estructuras particulares a particulares períodos.

Este es el primer edificio abovedado, que hasta ahora se ha prevado, existe fuera de las grandes áreas ceremoniales, por ser ésta la primera estructura pequeña sobre una plataforma baja, que se sepa tiene esta clase de techo. Su posición posee la posibilidad de que bóvedas eran, hasta cierto punto, usadas para moradas. Este en cambio, hace que la fecha relacionada sea de gran importancia.

Estamos tratando de establecer la proporción de cuando los edificios abovedados en Piedras Negras empezaron progresivamente a volverse sencillos según pasaba el tiempo, es decir, las paredes fueron hechas más delgadas y las habitaciones más anchas. Nosotros medimos los grados de "levedad" determinando la razón del grueso de la pared exterior con la anchura del cuarto encerrado por esa pared.

La tabla de resultados indica, en promedio, cuanto menos es el grueso de la pared que la anchura del cuarto. Un promedio alto significa paredes gruesas pesadas o cuartos estrechos (generalmente ambos) mientras que un promedio bajo indica paredes delgadas o cuartos anchos (generalmente ambos.)

La tabla de resultados de expansión de este edificio es una de las más livianas en la ciudad, y la más liviana para un edificio de esta clase particular, indicando, de acuerdo con nuestra hipótesis, una fecha relativamente tarde. Esto armoniza con la rareza aparente de los edificios abovedados entre las supuestas estructuras residenciales que rodean los centros ceremoniales. Uno es guiado a sospechar, y a fomentar una hipótesis para pruebas futuras, que solamente hacia el término de la historia de la ciudad, eran sus recursos tales que pudiesen permitir la extensión de los techos abovedados (los más costosos en labor y material) a la de edificios de menor importancia.

En el suelo fueron encontrados pequeños y planos cilindros de piedra de cal. Piedras completamente similares (con la excepción de que estas mostraron trazas de pintura roja en los lados) han sido encontradas antes en posición enterrada al pie de astral y debajo del suelo de templos. Esta pieza, combinada con otra encontrada más tarde en el suelo de la cercana Estructura F-4, nos ayudó con cierta certeza a atribuir la probabilidad de la función original de todo como altares de naturaleza portátil. Si ésta y las próximas estructuras eran viviendas (de sacerdotes o nobles) podemos sospechar razonablemente que las devociones religiosas de naturaleza privada o de familia eran parte de la vida del Viejo Impero, al menos entre las clases altas. Es interesante el notar que los altares de los hogares son todavía comunes en el distrito. Nosotros deberemos poder establecer si, sí o no, ellos tuvieron su origen con la venida del Cristianismo, por extensiva investigación de terraplenes de casas la cual solo ha empezado. Esta piedra fue trasladada al laboratorio y registrada en el catálogo para preservar el color rojo en sus lados.

Diez fragmentos de alfarería rota, de varias clases, fueron encontrados en los escombros. Ellos indican la probabilidad de la existencia de los tipos al tiempo de la erección de los edificios. No se encontraron otros objetos, como esperábamos, en esta excavación. Los números de estos objetos en el catálogo son: Ne-2-1 a Ne-2-3.

Estructura F-4 Este es un terraplén pequeño en el mismo patio que F-3, aunque levantándose hacia la plaza principal de la Sección Noreste. Los escombros fueron cavados en la línea central, como la Estructura F-3 y entonces un plan desconocido en este sitio, y generalmente raro en el área Maya, se indicó, el escombro caído fue removido del interior de la mitad de la derecha. Otra vez se hizo suficiente para hacer posible los dibujos de un plan completo. Veanse las fotografías Nos. 34-14 y 34-15.

El edificio estaba abovedado, y nuestras observaciones sobre la abovedada naturaleza de la Estructura F-3 se aplica con igual fuerza a este edificio con esta observación además: el índice de expansión de pared es el más sencillo encontrado hasta ahora en la

ciudad en esta clase de estructura (es decir una hilera de cuartos sencillos situados separadamente) y proximo al más sencillo de todos los edificios abovedados de toda clase, en la ciudad. Una fecha tardía es indicada, contando con que este método de fechar gane finalmente aceptación.

El plan irregular encierra una habitación central, con puertas conectando habitaciones a ambos lados. Los tabiques están situados tal como para sugestionar un plan sensible para usarlos como máximo esfuerzo de las bóvedas, una práctica bastante común en Yaxchilán, pero desconocido hasta ahora en Piedras Negras. La singularidad de el plan inclina a confirmar la fecha tardía, designada bajo la base del índice de expansión de la pared.

Los cuartos son casi cuadrados, y los de los confines estaban bien alumbrados con ventilación cruzada por medio de dos puertas cada uno, además de la comunicación con la habitación central. Combinando este alumbrado principal y ventilación con la posición del edificio sobre una plataforma baja en una area de terraplenes de casas. Podemos tentativamente concluir que estamos con una vivienda de clase superior, aunque escasamente comparable con los llamados palacios.

El cuarto central estaba equipado con un altar sencillo portátil, similar a los de la estructura F-3, pero sin quedarle huellas de color. No estaba adherido al suelo pero lo dejamos en posición, detrás del centro de la puerta del centro, cerca de la pared del fondo. Es posible que este cuarto era especie de capilla privada para servir a cuartos de vivienda en ambos lados. La idea gana un poco de fuerza por el acto de que la fachada fué probablemente decorada con diseños de estuco, como los edificios más suntuosos de los centros ceremoniales. Desde luego, es posible que el edificio fuese un templo de menor importancia. No podremos hablar con seguridad del funcionamiento de muchas clases de edificios hasta que todas las ciudades de tipos tales como este hayan sido investigadas, y todas las líneas de evidencia comprobadas.

Los únicos objetos recogidos fueron fragmentos de cacharros (representando tipos en existancia cuando las estructuras fueron construidas, con toda probabilidad), una herramienta de piedra (posiblemente un martillo) y fragmentos de adornos de estuco los que probablemente adornaban la fachada. Algunos de estos conservaban huellas de color. Los números de los objetos de esta operación en el catálogo son NE-3-1- a NE-3-9.

Structura J-29 Esta es una pirámide "falsa" de mayor proporción, edificada contra el fondo de la loma Acropolis, mirando hácia la Estructura F-3 y F-4. Es la única de su tipo fuera de los principales grupos ceremoniales, y el último para ser investigado, y fué, desde luego, de considerable importancia, y su investigación un paso necesario en la colección de material para una narración completa de los templos de Piedras Negras. Nosotros esperabamos algo muy diferente a lo que encontramos, por consiguiente, como en el caso de la Estructura F-4, nuestra zanja exploradora central fué extendida para incluir los escombros caidos de la mitad de la izquierda del cuarto, y de la parte frente de la pared exterior.

Veanse las fotografías Nos. 34-30 y 34-64. La mitad de la derecha puede asumirse que sea simétrica con la conocida de la izquierda y pudimos reconstruir el plan entero con certeza de que es, esencialmente al menos, correcto.

Razonando con nuestro conocimiento de todos los otros templos pirámides de la ciudad, y la distribución de sus varios tipos, llegamos a la conclusión de que éste debía ser abovedado, aunque la forma y la extensión del terraplén eran considerablemente distintos a lo que nosotros creíamos debían ser en tal caso. Nuestra investigación probó que en realidad era un templo abovedado, y que un plan único explicaba la apariencia engañosa del terraplén de escombros. Nuestro criterio en reconocer bóvedas caídas la profundidad del escombros, la presencia de cantidades de grandes losas y repello directamente en el suelo, la presencia de piedras especiales pavonadas, el desnivel de la superficie del escombros partiendo de la pared del fondo de un cuarto delantero mantuvo todo bien. Nuestra duda sobre tipos de techos en exámenes preliminares de superficies habían resultado de la ignorancia de la existencia de un tipo de templo en el cual un cuarto abovedado es respaldado por una masa sólida que no puede derrumbarse. Nosotros habíamos buscado el cuarto en el lugar erróneo. El trabajo en esta estructura nos advirtió que fuésemos cautos al contender con tipos de terraplenes desconocidos, pero al mismo tiempo pone un tipo nuevo en la categoría de tipos conocidos.

Aunque este templo cae en el período de la construcción de templos abovedados, contrario a las expectativas el indicio de expansión de la bóveda indica una parte temprana de ese período para su construcción. El índice es el más grueso encontrado hasta ahora en Piedras Negras. Nosotros estamos inclinados a formar la hipótesis de que la albañilería de bóveda fué usada aquí primero con la intención de extender principales áreas ceremoniales para incluir la Sección Noreste y que esta intención se abandonó en favor de reedificar los grupos viejos, dándoles los edificios más modernos. Este proyecto, creemos, cambió aspecto de los grupos del Este y el Oeste y acababa de empezar a modernizar el grupo del Sur. Aparentemente, aparte de este templo y de la gran escalinata adjunta a él, se le permitió a la sección del Noreste que quedase como área residencial.

De que este edificio es uno de los más tempranos, si no el más temprano, edificio abovedado de la ciudad, es hasta cierto punto confirmado por la presencia del altar de columna, encontrado en este caso en posición en un nicho en la pared del fondo del cuarto. Este tipo de altar ha sido encontrado en todos los templos sin bóvedas, dos de ellos enterrados, y en el templo abovedado Estructura K-5-1a, la última siendo asociada con astral fechado y lintel. La similitud en los planos del cuarto de éste templo y de éste los conecta como si probablemente pertenecieran a la parte temprana de nuestro supuesto período de bóvedas, el cual basándonos en las

fechas de la K-5 y el índice grueso de este cuarto similar, probablemente empezó mucho después que la ciudad había sido fundada y había crecido hasta cierta importancia con techos de material perecedero. Nosotros llegamos a esta conclusión tentativa hace un año. Esta operación fortalece la hipótesis.

El edificio nos da dos detalles de plan los cuales son muy importantes por ser únicos en la región, y quizás en la area Maya como hasta ahora conocida.

a. Aunque el edificio tiene suficiente fondo para permitir dos cámaras, una detras de la otra, solamente hay una cámara, al frente. Detrás hay solamente una masa sólida, la cual tenemos razón para creer que fué construida como tal, y que no es un cuarto de atrás llenado subsecuentemente.

b. Desde la parte atrás y el tope del nicho del altar (el mismo, un semblante extraño) un cañón pasando por esta sólida masa, se dirige al aire libre al fondo del edificio, levantandose lo más que puede sin salir sobre la cornisa. La posición y el humo no dejan duda de que éste algo elaborado arreglo fué intentado como ventilador para llevarse el humo de fuego del altar en el nicho. Una modificación subsecuente del nicho puede haber sido intentada para hacer que esta chimenea halara mejor y pueda que el conocimiento del principio de una buena chimenea estuvo implicado.

Además de los tiosos de costumbre y una o dos cabezas de figurines, dos descubrimientos de considerable importancia científica fueron hechos, aunque su condición destruida nos da solamente una baga idea de su anterior valor artístico.

a. El primero son seis fragmentos de loza esculpida malamente corroidos, los que habían sido rotos y usados como meras piedras de construcción cuando se estaba edificando el edificio. El templo por consiguiente debe haber sido edificado después de la destrucción de las piedras. Aquí tenemos evidencia adicional que aunque el edificio implica la más pesada y estructuralmente más primitiva bóveda de piedra conocida de este sitio, puede escasamente haber sido uno de los templos edificados más tempranamente. Debe haber habido un período durante el cual la piedra era cincelada, usada, destruida y vuelta a usar como material de construcción. Es una gran lástima que las largas inscripciones sean ilegibles, pues sería evidencia de primera clase para una futura fecha de la introducción de la técnica de bóvedas. Se espera que nosotros todavía podamos obtener algún conocimiento de la fecha de estas piedras por medio de comparaciones estilísticas.

Este pedazo es importante en otro respeto. El color rojo que queda y un surco ornamental que corren al largo del tope y en los bordes prueba que no fué diseñado para lintel de puerta, sino que fué con toda probabilidad un panel vertical, designado para ser colocado en la pared de algún edificio u otra estructura. Esto nos da idea de la naturaleza de las trece losas cinceladas que

han sido colocadas como linteles pero que, por cierto número de razones, han estado bajo sospecha por algún tiempo. Ésta es la primera de esta clase de piedras que indica que no podía haber sido un lintel, y muestra tantas similitudes a las otras que hace casi ciertas nuestras deducciones sobre ellas. El número de catálogo de este pedazo es NE-4-13. Véase fotografías Nos. 34-75.

La eliminación de Piedras Negras como una ciudad donde la escultura de linteles de piedra se practicaba hasta cierta extensión socorre el sitio de Yaxchilán con un margen algo estrecho. Verdaderamente deja aquella ciudad, con cuarenta y cinco ejemplares conocidos, la única ciudad en toda la área Maya, hasta ahora conocida, donde más de un uso esporádico pequeño de estos miembros estructurales como un campo para embellecimiento artístico es indicado. Algún día éste hecho debe ser explicado. Indirectamente esta piedra, enteramente destruida en tiempo Maya, sirve más adelante para demostrar que las ciudades de la región Usumacinta, contemporánea y sin duda con comunicación estrecha, eran asombrosamente independientes una de la otra de muchas maneras.

Specialmente encuentros desinteresantes tales como éste formarán eventualmente una base firme para deducción según organización política, grado de libertad artística, etc., entre el viejo Imperio Maya. Es a esta importante clase de conocimiento que la arqueología, de acuerdo con una opinión común, puede contribuir con muy poco. La investigación completa de ciudades de tipo, en una de las cuales sus expediciones se ocupan ahora, debieran formar una prueba razonable de esta opinión. Nosotros podemos reportar que ya nosotros tenemos un considerable material de evidencia que mientras estaban usando comunes fundamentales conceptos, métodos y materiales, los arquitectos y artistas de las tres vecinas ciudades de Palenque, Yaxchilán y Piedras Negras eran notablemente independientes los unos de los otros en la manera de usar sus herencias comunes. Al extenderse esta independencia hasta los planes fundamentales de templos, y como que el arte escultural era evidentemente la criada de religión, un parecido grado de independencia entre los sacerdocios directores locales pueden inferirse.

b. Un segundo hallazgo, otra vez de poco valor estético, aumenta nuestro conocimiento de modelación en estuco en Piedras Negras. Datos en éste son vagos por la naturaleza decadente del estuco. En el escombros que cubre el cuarto de templo (pero no fuera) se recogieron parte de la frente y un ojo de una cabeza más grande que una de tamaño natural, un tapón de oreja, una roseta y dos dedos delicadamente modelados, todos en escala grande. Con poca duda estos vinieron de figuras rotas antes o en el tiempo de la edificación de los edificios, y fueron tirados en la albañilería del techo. Como las losas, ellos probablemente datan hacia un período pre-bóveda en la historia de la ciudad.

Esta es la primera evidencia de que cabezas de estuco de tamaño grande (de las que dos, también rotas, han sido encontradas en años anteriores) vienen de anteriormente completos, o parcialmente completos, cuerpos. Éste es el primero en mostrar figuras grotescas. En este caso eran inmensos ojos protuberantes y una ancha y aplastada raíz de nariz. Es posible de una figura (ídolo)

del Dios de la lluvia.

La calidad de el modelado es muy fina, dandonos un tercer ejemplo para probar que la modelación de estuco en esta región estaba al igual que la escultura de piedra. Pues en los otros casos, todas las partes recuperadas habían sido embarradas rudamente con un espeso baño de emplasto blanco, obliterando completamente la hermosura de la pieza. El significado de esto queda por dilucidar. No hay duda de que esto ocurrió durante la ocupación de la ciudad por los clásicos Mayas, y no durante la ocupación, más tarde, por gente con falta de sentimiento por la hermosura. Los otros dos ejemplares vinieron de debajo de suelos de templos, estos probablemente de debajo de la superficie de los techos. Posiblemente figuras de templos antiguados fueron rotas y echadas en la albañilería de las nuevas para transferir e inspirar algunas virtudes trascendentales en el edificio nuevo, y el embarramiento puede haber sido parte de la seremonia. Tales costumbres hacen recordar los fragmentos rotos del viejo astral en las fundaciones para los más tardios en Copán.

Cierto tipo de tiestos, encontrados en los escombros en el suelo del cuarto, probablemente vienen del mismo origen, y la existencia de tipos antes de la edificación de estos templos puede ser postulada. Tiestos, fragmentos de estuco, fragmentos de cuatro figurines y los fragmentos del panel cincelado fueron inscritos en el catálogo (Nos NE-4-1 a NE-4-7) y dejados en el laboratorio del campamento, sellados por el agente de aduanas.

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El informe que antecede cubre por completo las únicas tres operaciones en que se hicieron excavaciones de cualquier clase. A nuestra vuelta de Yaxchilán unas dos semanas se dedicaron al dibujo de planos y secciones y a analizar los resultados de aquellas operaciones. Además, durante este período una gran area de maleza se limpió alrededor de las Estructuras F-2 a F-4, y desde la pirámides J-29, un estudio de la superficie de la última se hizo más tarde, con una trocha medida cabalmente y nivelada. Los mayores aspectos de su diseño fueron hechos, sin excavación. Después de haber despedido tres de nuestros hombres, transferimos nuestros estudios los Grupos del este y sur, y a la sección del Sureste.

Estructura P-7: De esta fecha en adelante, la mayor parte de nuestra atención fue dedicada a la Estructura P-7, la que había sido parcialmente excavada por el Dr. Masen en 1931, nuestra primera temporada. Se sentía que este edificio, que en plan es absolutamente único, en la area Maya, era de mayor importancia porque aparecía poca duda de que el techo era una combinación de albañilería de bóveda con un techo plano de viga y concreto. Tal combinación es de gran interés para la historia de la arquitectura Maya, y ha sido hasta ahora desconocida. Además, el techo plano de concreto no ha sido reportado, con certeza, aún cuando usado solo, en el area del Viejo Imperio, puede suponerse que se originó en las tierras áridas fuera del país Maya. Nos pareció que al presentar ante nuestros colegas la evidencia de tal inesperado aspecto debieramos tener un juego más completo

de dibujos incluyendo especialmente cuidadosas trochas en muchos puntos, combinadas con el estudio cuidadoso del escombros caído, y la busca de cualquier otra cosa que pueda tener relación con la construcción de techos. O sea, aplicar a estos edificios lo que aprendimos desde 1933 con referencia a bóvedas caídas. Los dibujos y observaciones se hicieron cuidadosamente, y aunque los resultados no han sido sometidos todavía al Dr. Mason, ellos ayudarán, el que escribe cree, materialmente en sostener su interpretación de estos notables edificios. Mientras considerable limpieza de maleza se llevaba a cabo en las vecinas áreas, la mayor parte del tiempo disponible del que escribe fué invertido en estas estructuras durante el período de casi tres semanas.

Miscelanea. El tiempo restante fué invertido en comprobar varias medidas y observaciones de otros años, notablemente entre las estructuras Acrópolis y los importantes templos de pirámides K-5-1a y O-12; y en hacer estudios de superficie estudios topográficos de como una docena de terraplenes en el Grupo del Sur y la sección del sureste. Los resultados aquí fueron especialmente gratificantes, pues pudimos establecer, sin excavación pero sin duda alguna, la presencia de dos largas galerías o "palacios". No abovedados. Solo uno de estos era hasta ahora conocido, y era del mismo algo complicado plan que los palacios abovedados Acrópolis y situado entre ellos.

Los palacios nuevos - Estructuras S-17 y S-18 son de simple plan, sin fondo o cuartos del fondo. Sus tipos, posición y mera existencia fortalece materialmente nuestra teoría de que los edificios de la superficie en la parte sur de la ciudad eran retenidos de otro período anterior cuando la famosa bóveda Maya, para esta ciudad, una cosa del futuro.

Razones para suponer que todos los templos abovedados de la ciudad pertenecen a un período relativamente tardío de su historia, han sido ligeramente tocadas en esta relación. Mientras necesitamos más trabajo para estar seguros, estamos ahora en posición de formar un hipotético pero lógico trazo para la historia de los palacios de Piedras Negras también nuestros conocimientos principian con una larga y sencilla galería abierta, sin abovedar (Estructuras S-17 y S-18) luego, la galería es doblada (una al frente y fondo, separada por una pared del medio) y cuartos de fondo se agregan. Este desarrollo se llevó a cabo en el Acrópolis mucho después de haberse hallado la ciudad, como sabemos por excavaciones estratigráficas allí. Es posible que hallan huellas perdidas entre ellas, y aun sin ser así, el pase de tiempo es implicado. El techo está todavía sin abovedar (Estructura J-12). Después de esto, el plan fundamental de palacio se quedó sin cambiar por palacios situados independientes, pero los techos eran abovedados (los siete techos abovedados del Acrópolis). Un sub-tipo (posiblemente no nuevo), el sobre-edificado se adaptó él mismo al terreno del Acrópolis. Desde el punto de vista de uso, éste fué esencialmente lo mismo que la galería sencilla sin abovedar encontrada este año. No obstante uno fué construido para servirle de casa a un monumento tardío (Cuarto 1 de Estructura J-6, incluyendo Trono 1). La galería larga y abierta persiste hasta el fin, así es que una función común puede asumirse

por todo. Mientras entre los placios abovedados los planes quedaban esencialmente firmes, hay pequeñas diferencias, y los índices del arco de bóveda indican una dominación progresiva de ingeniería técnica, que otra vez implica tiempo. Nuestros estudios de superficies nos han ayudado así a traer los palacios en línea con los templos, dándonos valiosa ayuda en la tesis de que la historia arquitectural de la ciudad comprende dos períodos mayores - el primero en el que la bóveda Maya no se usaba, y el segundo en que era la regla para edificios importantes.

Si durante nuestro postulado pre-abovedado período, la bóveda fue conocida, pero más allá de las habilidades o recursos de esta particular ciudad, puede ser determinado solamente cuando tipos de sitios de todas las sub-areas sean bien conocidos.

Nuestra creencia de que todos los edificios del Grupo del Sur y la sección del Sureste no eran abovedados (en riguroso contraste con los grupos del Oeste y el Este) fue reforzada por cuidadosas observaciones y medidas en las superficies de las Estructuras importantes O-2, y de la Estructuras S-5, S-6, S-7, S-8, S-9, S-10, S-11, S-12, S-13 y S-16. Un estudio similar fue hecho del importante terraplen P-6. En todos estos casos nosotros pudimos decir que no hay prácticamente duda de que el techo abovedado estaba ausente. Además, en la Estructura S-19 agregamos uno más a los ejemplares conocidos de una clase especial de edificios pequeños, probablemente templos, los que están colocados en plataformas bajas tienen muy bajas estrechas y sencillas entradas del frente, las que están adinteladas con macizas dinteles sin esculpir. Algunos de estos fueron probablemente abovedados y otros probablemente no. Esto debe ser finalmente determinado por excavación, pues factores complicantes tales como pasajes reducidos, y relativamente grandes construcciones se sabe que han ocurrido en algunos de ellos. Sus investigaciones es todo lo que queda que realizar antes que nosotros estemos en posición de dar una justa y completa relación de todos los edificios evidentemente ceremoniales (i.e. templos) de la ciudad. El dintel pesado confirma más aún nuestra deducción sobre las dimensiones en bóveda para este miembro estructural, y agrega otro poco de evidencia de que la mayor parte de los llamados esculpidos dinteles de la ciudad eran realmente otra cosa.

En esta clase de trabajo, desde luego, no se encontraron ningunos objetos, pues la area había sido examinada ya superficialmente con el proyecto de hacer mapas, y la vegetación no se limpió completamente. No obstante, una espléndida adición a nuestra colección de figurines, los que, con algunos otros objetos fueron recogidos en distritos vecinos, e cercanos, y regalados a nosotros por amigos de la expedición. Porque la mayor parte de estos se le adeudan al Sr. Rufino Ramos, uno de nuestros trabajadores, quien los encontró mientras preparaba su terreno para maíz. Los números de estos regalos en el catálogo son: M-23-1 a M-23-21; M24-1 a M-24-2; y M-25-1.

Durante el curso de la temporada, para la mayor parte de las operaciones, diseños del terreno se convirtieron en cuidadosos dibujos para escalar, una practica que reduce grandemente la probabilidad de un error u omisión, un hecho que se ha hecho aparente repetidas veces. Se limpiaron objetos, se registraron en catálogos, fueron dibujados y guardados cuidadosamente en cajas selladas por el Agente de Aduanas. Un total de ciento noventa y seis fotografías fueron sacadas y desarrolladas en el sitio, y ochenta y seis más sacadas en otros lugares, especialmente en

Yaxchilán, se desarrollaron allí.

Respetuosamente Sometido,

Director de Operaciones.

CUARTA EXPEDICION A PIEDRAS NEGRAS, 1934.

Resumen Sobre el Resultado de las
Examinaciones Superficiales en Yaxchilán, Chiapas, México,
y en Sitios Vecinos.

(Véase memorandum separado sobre el trabajo en Piedras Negras).

La oficialidad, la cual consistía del Director de operaciones en el terreno y la Sra. Satterthwaite, acompañada de un cocinero y tres de nuestros cuatro obreros, salió de Piedras Negras el 1 de Mayo, llegando al termino de cuatro días de viaje río arriba a la grande e importante arruinada ciudad de Yaxchilán, el 4 de Mayo. Aquí trabajamos hasta el 12, saliendo de Yaxchilán temprano en la mañana del 13 de Mayo, llegando a Piedras Negras en la noche del 14 de Mayo, después de hacer ciertas rápidas examinaciones de sitios en el camino.

Yaxchilán

Nuestro principal objeto en hacer este ligero viaje de paso fue para estudiar, y especialmente medir, los muchos edificios parados o parcialmente parados allí para probar nuestro método de fechar por medio de ~~el espesor de la pared~~ proporción de la expansión, en otro sitio. Los principios que soportan este método, y la manera del arribo a índices por los cuales el grado de "liviandad" de un edificio es comparado con otro, se demuestra brevemente en el reporte sobre el trabajo en Piedras Negras. Trabajamos en Yaxchilán bajo el permiso especial del Sr. Dr. José Reygadas Vértiz, jefe del Departamento de Monumentos del Gobierno Mexicano a quien el museo le está muy agradecido. Infortunadamente el Departamento no se sintió justificado en concedernos permiso para hacer las pequeñas excavaciones que en muchos casos son necesarias para determinar el espesor de las paredes, y la anchura de los cuartos. Por esta razón, las medidas de muchos edificios están incompletas. Pudimos, no obstante, recoger suficiente para convencernos del valor esencial del método, y a hacernos creer que con permiso en algun tiempo futuro, para limpiar escombros suficientemente para determinar el espesor de las paredes, y la anchura de los cuartos, podremos asignar la mayor parte de los edificios abovedados de la ciudad a períodos de tiempos específicos.

Parciales o completas medidas de todos los espesores importantes de paredes y anchuras de cuartos (expansión) fueron obtenidos para los siguientes edificios: Est. 6 Est. 40

25 }
30 } Entablicados,
7 } en
23 } 33 } clase
10 } 44 } sencilla
11 } 42 }
12 }
13 }

la región o proporción entre el espesor de las paredes y la anchura de los cuartos

Estructura 39	} Clasificadas	
10A		} sencillas,
10C		
22		
46	} Clasificadas sencillas	
U1.		} no contrafuertes

Así obtuvimos información, aunque incompleta, en un número de casos, en diez y nueve de los edificios de Yaxchilán. Probablemente no hay más de media docena de otros edificios abovedados en el grupo ceremonial principal de la ciudad; así es que con muy pequeño escombros que se remueva sería posible el completar nuestras medidas, no solamente ~~se necesita~~ todavía en los edificios mencionados, sino también en los otros ^{medidas} para que nosotros tuviésemos un juego completo de medidas de trochas y los índices que se pueden calcular de ellas, para todos los grupos principales de Yaxchilán.

Hasta que dicho juego completo de medidas no sea disponible, conclusiones finales no podrán ser trasadas sin peligro. Es más, la aplicación de este método en Yaxchilán debe ser hecha con mayor cuidado que en Piedras Negras, por la presencia en el sitio de Chiapas de aspectos complicantes tales como tabiques atravesados y contrafuertes interiores ~~que~~ que en muchos casos ayudan a soportar bóvedas, y pueden haber afectado la proporción de la expansión de la pared.

No obstante, un principio de interpretación, entre sub-grupos de edificios que tienen ~~características~~ suplementarios tales como éste en común, o que son colocados aparte por su ausencia, ha sido hecha. En particular hemos podido hacer un caso presuntivo justo que la fecha relativa de dos de las tres unidades llamada estructura 10 por Maler, debía ser revocada - esto es, la parte considerada tardía por él es temprana. Como que la parte indicada como tardía por los índices lleva una fecha tardía (9.17.0.0.0) en sus dinteles, tenemos aquí una confirmación parcial de nuestro método.

Aplicando el método a la estructura 12, una fecha tardía se indica claramente en el periodo de fabricación de bóveda de la ciudad. Un estudio de la construcción interior de las paredes de éste y otros edificios similares, revela un débil pero definido corazón de concreto, una táctica desconocida en Piedras Negras y probablemente en Palenque, las otras dos importantes ciudades de la región Usumacinta, y probablemente muy rara en Yaxchilán. Este arte es un arte adelantado y conocido, y puede ser precursor de las paredes de concreto del "Nuevo Imperio" en la parte norte de Yucatán. Ocurriendo como sucede en estos dos edificios similares, que también son únicos en plan, este arte, hasta que tengamos determinada evidencia a lo contrario, debe ser considerado como un desarrollo relativamente tardío. El valor del método es confirmado así desde otro punto de vista. Por lo contrario, Dr. Morley considera que los dinteles esculpidos de este edificio son tempranos. De que los dos métodos de fechar relativamente puedan ser reconciliados queda por verse. La presente contrariedad no es en ningún sentido infortunada, sino una buena condición para investigar en un terreno prácticamente desconocido tal como esta región Maya. Estimulará la investigación de otra evidencia, y reexaminar lo que hay en mano, y eventualmente ~~establecer~~ investigación en el desarrollo arquitectural, o la evolución de estilo

en donde necesitamos

glifo, quizás ambos, sobre fundación más firme.

Los índices que nosotros podemos obtener varían de 69 por ciento bajando hasta 24 por ciento, mientras que aquellos en Piedras Negras se colocan de 74 a 18 por ciento, y hay correspondencia aproximada. No obstante, los edificios de Yaxchilán con la construcción más pesada (alto índice) puede muy bien haber sido hecho así por razones no eficaces en Piedras Negras, tales como bóvedas muy altas, y construcción pesada de albañilería ornamental en el techo, y así ser contemporáneos con algunos de los edificios más ligeros en Piedras Negras. ~~Por consiguiente~~ el significado cronológico del índice, cuando propiamente descontado por factores exteriores (evidencia factor ~~orden~~ de la habilidad actual de edificar edificios abovedados de ~~tal~~ grado ~~de~~ de ligereza a ~~tal~~ tiempo ~~de~~) la evidencia según esta, sugiere que los edificios abovedados empezaron en Piedras Negras antes que en Yaxchilán. Si nosotros pudiéramos en el futuro establecer tal punto, nosotros habríamos dado un paso hacia la deducción de la dirección en la cual se esparció el arte de la edificación abovedada en las regiones del Viejo Imperio. Cuando eso se sepa sabremos donde buscar su origen.

La evidencia en Piedras Negras indica energicamente hacia un período temprano cuando la ciudad prosperaba, pero ~~ni el uso~~ ~~no el otro~~ supo, o no uso, la albañilería abovedada para techar sus edificios. Esto hizo importante el saber si lo mismo pasaba en las otras ciudades de la región. Esto no puede determinarse definitivamente sin un programa mejor de excavación y estudio, en el caso de Yaxchilán, pero un principio puede ser, y fue, hecho de una examinación superficial. Valuable aunque ~~indica~~ ~~yante~~ evidencia en este punto fue conseguida al encontrar en Yaxchilán, como también en Piedras Negras, una buena esparción de terraplenes dentro de las grandes áreas ceremoniales, los cuales no soportaban edificios abovedados. La teoría, desde luego, es, de que éstos son dejados de período pre-abovedado, los cuales no habían sido reemplazados con las estructuras más modernas cuando la ciudad se acabó. Usando los métodos desarrollados en Piedras Negras pudimos satisfacernos de que los terraplenes siguientes eran las ruinas de estructuras sin bóvedas: Est. 4, 5, 8, 15, 18, y 51. Todas éstas exceptuando Estructura 18, una pirámide, se juntan a abovedados edificios, y todos ^{están} colocados en importantes posiciones. Nuestras determinaciones sobre el inabovedado caracter de estas ruinas deben por consiguiente, ser comprobadas por excavaciones menores. La limpieza del escombros de el suelo en una línea del frente al ~~posterior~~ (trabajo de una hora o dos en esta clase de estructura) aclararía el asunto. No obstante, tenemos confianza en estas ~~determinaciones~~ ^{superficiales} según están, y la teoría de que Yaxchilán pasó por ^{un} temprano período in-abovedado puede decirse que ha pasado la primera prueba.

Podemos añadir considerablemente a nuestras primeras series de medidas de ^{de} dinteles de piedra y ^{de} entradas. Parece inevitable la conclusión de ^{de} que, con las más raras excepciones, los dinteles de piedras eran pesadas y no livianas losas, y son suficiente largas para sobresalir entre los ~~quintales~~ ^{quintales} en ambos lados de la entrada. Este conocimiento es muy útil al determinar, como creemos hemos hecho con éxito, de que casi todos los supuestos exculpados dinteles de Piedras Negras eran realmente paneles verticales.

Una comparación de la anchura de las entradas de las dos ciudades muestra una casi universal preferencia a Yaxchilán para entradas estre-

chas, casi siempre ~~redondas~~ ^{cuadradas} por dinteles de piedra. En Piedras Negras, dinteles de madera sobre anchas entradas eran la regla, excepto por una clase especial de edificios pequeños. El resultado fue, más oscuros y menos ventilados cuartos en Yaxchilán. Aparentemente los arquitectos de Yaxchilán preferían apearse a los dinteles de piedra, los que no son propios para entradas, ^{anchas} al sacrificio de algún aire y luz. Estas observaciones se aplican solamente a los edificios abovedados de Yaxchilán, puesto que los planes de edificios con techos soportados por materiales perecederos (madera) no pueden ser desarrollados sin excavación.

Pudimos medir la profundidad del escombro, caído en cierto número de edificios donde ~~las bóvedas encontradas~~ ^{nos} nos dió información completa de ~~lo~~ ^{qué} ~~que~~ ^{había} ~~caído~~ ^{exactamente}. Esta es una prueba valuable de métodos usados al determinar la presencia o ausencia anterior de bóvedas en edificios completamente derrumbados. Incidentalmente la profundidad del escombro donde las bóvedas se sabe que eran altas excede todo en Piedras Negras excepto Estructura O-13. Parece probable que podremos decir con certeza, por comparación de la profundidad del escombro en algunos edificios de cada ciudad, que ninguno de los edificios en Piedras Negras, excepto O-13, tenía bóveda alta, una cosa importante para saber por ambos puntos de vista: conocimiento de ingeniería, y actual efecto estético.

Muchas observaciones de valor fueron hechas sobre la técnica de edificación, tocando la función estructural de las piedras de caballete, ~~fibra~~ ^{de} molduras, superficies de techos, etc., algunos de los cuales probablemente duplican observaciones, todavía sin publicar, por la Expedición de la Institución Carnegie de 1931. En general, no obstante, nuestras investigaciones fueron designadas para evitar tal duplicación de esfuerzo, y con esto en la mente, muy poca atención se le puso a los adornos, ~~diseños~~ ^{ornamentos} de moldura y fachada, etc.

Con respecto a las espléndidas esculturas de Yaxchilán, no les pusimos atención excepto por dos piezas encontradas por el encargado permanente desde que la Institución Carnegie ~~entró~~ ^{miró} este terreno. Un nuevo dintel esculpido, encontrado por el encargado, Sr. Ulises de la Cruz, y visto por nosotros en 1933, fue retratado este año (No. 34-237) por medio de luz artificial. La vista está muy lejos de ser satisfactoria, pero una buena fotografía no se puede hacer sin mover el dintel (el cual no se ha caído del todo) o en lugar de esto, limpiar el escombros en la entrada para que la cámara se pueda colocar directamente debajo de éste, y a razonable distancia debajo de él. Esta escultura es de gran interés por estar en un edificio muy separado de la área hasta ahora investigada. Está cerca de la orilla del río, a un kilómetro o más río arriba, del límite, río arriba, topografiado por la gente de Carnegie.

Un fragmento de escultura muy interesante fue encontrado en la superficie del ~~las~~ terraplén sin abovedar cerca de las Estructuras 2 y 3. El Sr. de la Cruz, al localizar estos terraplenes para nosotros, tropezó con un metate el que, al volverlo, se encontró que era un fragmento de escultura reusado de gran interés. Este se muestra en las fotografías Nos. 34-228 a 34-239, y por un dibujo en 34-240. Por la delgadez de la losa el que escribe cree que no es parte de un dintel. Puede fácilmente ser parte de un panel vertical tal como eran, ~~según~~ ^{según} nuestros creencia, famosos llamados "dinteles" de Piedras Negras. El espesor es solamente 12.5 cms.

El Sr. de la Cruz, el encargado del gobierno, ha hecho una interesante colección de hallazgos superficiales, a la cual fue añadido este inmediatamente. Este ^{incluye} incluye un tipo de metate pequeño completamente diferente, encontrado también en Piedras Negras, piedras de mano o molinos de piedra, figuras de barro, pitos, fragmentos de alfarería herramientas de piedra etc., los cuales fueron dibujados y retratados. Se muestran en las fotografías } Num. 34-242 a 244.

El Sr. de la Cruz, era incansable en su entusiasmo dirigiéndonos a los varios edificios, ^a nuestra conveniencia antes que la suya, y fue bondadoso ayudarnos el mismo a hacer nuestro alojamiento temporal lo más cómodo posible. Aunque ^{nuestros trabajos} eran suficientes para hacer el chapeo deseado, él aseguró que pondría a sus obreros a trabajar en los terraplenes que deseábamos examinar.

El museo le está agradecido al Dr. José Reygadas Vértiz, y a nuestros otros amigos en el departamento del cual él es cabeza, por el permiso del gobierno para ~~ejecutar~~ las investigaciones trazadas. Aunque nuestros resultados hubieran sido más completos y valuales si se nos hubiese permitido hacer excavaciones superficiales como fue pedido, el rechazo en este caso fue enteramente ^{entendido} justo. No es posible instruir completamente a encargado residente, quien no es arqueólogo, hasta qué extensión pueden ser permitidas las excavaciones, y si un representante especial del gobierno no se puede proveer, el departamento del gobierno interesado debe depender en la mayor parte en la habilidad y honradez del aplicante. Una respuesta afirmativa a tal petición requiere, como se dijo, cuidadoso estudio y consideración, para el que no hubo tiempo.

Sitios Miscelaneos

Un sitio arqueológico hasta ahora desconocido, se nos reportó que existe en las márgenes ~~orientales~~ de un pequeño lago llamado "Encajonado del Salvamento", probablemente a no más de dos o tres leguas de Yaxchilan pero en el lado de Guatemala del río. El lago está cerca del río pero separado de este por una loma precipitosa. En nuestra jornada de vuelta nuestra partida paró por cuarenta minutos mientras el que escribe siguió nuestro informante, Gaspar de la Cruz, hasta el lago. faltaba el tiempo para bordear el lago y llegar hasta las ruinas, pero sabiendo la posición del lago, ellas se podrán encontrar en el futuro. Se han reportado paredes paradas allí. Aquí, como en la ruta entera, un croquis fue hecho, con frecuentes situaciones y notas de tiempo, como ayuda para localizar puntos de interés. El nombre de este lago es algo engañoso, pues está justamente más abajo de "La Garganta" la cual está en ~~el punto de la gran~~ ^{el punto de la gran} ~~civdad~~ ^{civdad} e laberinto del Usumacinta el que sirve también para localizar a Yaxchilan.

Justamente más abajo de Salvamento ^{esta} otro sitio, según reporte de nuestros boteros, llamado "Burelo". Aquí pasamos unas tres horas buscando en las malezas. Pudimos localizar dos pequeños terraplenes en el tope de una loma alta, y un metate del tipo acostumbrado prueba la ocupación anterior aquí, pero no pudimos, en el tiempo disponible, encontrar los terraplenes grandes que se supone existen aquí. Este sitio está también en el lado del río que pertenece a Guatemala.

Nos demoramos lo suficiente para examinar apresuradamente el sitio

llamado "El Chile" y descrito brevemente por Maler. Las ruinas aquí aparecen ser bastante extensas, y debieran ser investigadas más. Se tomaron cuidadosas notas para localizar este sitio en el futuro. Aunque el local general de un sitio sea conocido, se puede perder mucho tiempo para llegar a él, si el guía no conoce el lugar con exactitud.

Después de pasar la noche en Desempeño, la Sra. Satterthwaite siguió para Piedras Negras para arreglar el campamento para nuestra vuelta, mientras tanto el que escribe fué río arriba con la otra canoa a investigar un nuevo sitio al otro lado del río frente a "El Cayo" de Maler. El Sr. Don Silverio Camposecoz nos llamó la atención de este sitio y nos proveyó con un guía. El reporta paredes paradas y restos de bóvedas allí, los cuales no encontramos, probablemente por falta de tiempo. Encontramos el sitio sin embargo y puede ser ~~prueba~~ de gran interés. Examinamos un acrópolis el que es extraño en tres aspectos, además de su excesiva altura y pendiente. Las terrazas de retén de paredes están bien construidas de raras piedras grandes. La extremidad de la ^{pared} de arriba está encorvada para formar un semi-círculo. Los edificios ^{edificados} en ella aparecen, según examinación superficial, no ser abovedados, y esto parece también ser verdad de una área extensiva más abajo.

Una circunstancia interesante aquí es la presencia de muchas largas grietas en la cama de la roca, con cuevas, una de las cuales parece haber sido artificialmente encontrada. El sitio ha sido llamado "El Cayo II".

Un esfuerzo para localizar las dos piedras esculpidas, llamadas dinteles por Maler, y encontradas por él en "El Cayo", casi directamente al lado opuesto en el lado mejicano del río ^{en} Chiapas, fracasó. Estas han sido mudadas más cerca a la margen del río desde el tiempo de Maler, y juzgando por la información procurada después que nosotros salimos, pueden ser localizadas todavía.

En "Las Escondidas," al lado opuesto a Desempeño, se nos permitió bondadosamente sacar fotografías de un completo taxón con tripodes, y un pison ^{de corteza}, encontrados por los ~~montes~~ ^{en} un nuevo sitio de Chiapas que se dice está a dos o tres kilómetros de "Samaneo", el cual es un nuevo campamento unas dos leguas tierra adentro, casi opuesto a Piedras Negras. No visitamos este lugar por falta de tiempo, intentando ir a él más tarde por una ruta más directa desde Porvenir, precisamente más abajo de Piedras Negras. Más tarde, la creciente de las aguas previno el cruzar por este punto.

Breves visitas deben hacerse a ambos "El Cayo, II" y Samaneo en los años futuros, pues se puede llegar a ambos en un día desde nuestro campamento.

Se vuelve de una manera aumentativa aparente que las principales ciudades conocidas del valle Usumacinta - Yaxchilan, Palenque y Piedras Negras - no son de ningún modo centros aislados, sino que todo el terreno está salpicado de sitios arqueológicos, algunos de los cuales puede que sean de considerables tamaños. Las implicaciones posibles son muy interesantes. Si eran todos más o menos contemporáneos debe haber habido

una población densa en distritos semi-montañosos, probablemente dependiendo en parte de alimento importado. Si no, la historia del Maya en este distrito probablemente se retrasa mucho más allá del período clásico, no obstante la ausencia de monumentos ~~construidos~~ fechados tempranamente.

Un total de ochenta y dos fotografías fueron hechas en esta excursión de dos semanas, de las cuales cincuenta y dos son de interés arqueológico. Los números de catálogo de éstas son: 34-197 a 34-248. Las otras, escenas del río, casas y gente modernas, no se han desarrollado todavía.

Respetuosamente ~~_____~~

Director de operaciones