THE ARCHITECTURE OF THE ITZA MAYA

A Study Based upon the Reports of Archaeological Findings

by

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A Thesis
Presented to the Faculty of
The Rice Institute in Partial Fulfillment
of the Requirements for the Degree of
Master of Arts
in the
Department of Architecture

The Rice Institute
Houston, Texas
May, 1939

39-2983
Archaeology has found a rich and promising field for research among the ancient cultures of the Americas. One of the first apparent, and not the least interesting, aspects of this field is the wide range and variety of individual cultural attainments which obtained within the apparently homogenous racial stock over most of the northern continent. The miscellany of the pattern of tribal life throughout this area exhibits a wide range of differences in family life, character, custom and habit, in government and religion, in language, and in art and industry; and yet through them all, the underlying character of the redman is seen and recognized.

These differences and similarities found their expression, varying in degree of skill, in the arts of the more than four hundred tribes now distinguished and grouped into general cultural and geographic areas.

In our southwestern states dwell tribes in whose skillful works the artistic ability of the redman is unquestioned. The Apache camp dweller may proudly display
his basketry. The pottery of the Hopi and Zuni shows a rare aesthetic appreciation of harmonious colors and pleasing geometric designs, as well as mechanical abilities. The tapestry weaving of the Navajo, although it may be a borrowed art from his Pueblo neighbors, is a remarkable accomplishment that depends upon his fine handwork. His silver work is scarcely less widely known.

Prehistoric pottery from the Lower Gila River, the cliff dwellings of Mesa Verde, the Basket Weaver work from the San Juan drainage, and various kinds of artifacts from other localities show artistic accomplishment to be an early characteristic of the Indian.

Moving southward along what may once have been the migratory highroad of these peoples, we find culture reaching new heights in the highlands of central Mexico. In very early times a primitive settled agricultural civilization apparently had spread through the arid tropical highlands of central Mexico, Central America, and the northwestern corner of South America in what Spinden has called the Archaic Horizon. This was interrupted and revitalized in one area and then another by intermittent waves of nomadic tribes from the north, who soon adopted and built on the achievements of their forerunners. The result was a very rich and diversified pattern of rivaling cultures.

* Spinden, 1915 and 1917
Out of this mat of cultural variety civilization rose to its height in two peaks: the Toltec (followed by the Aztec) in the Valley of Mexico, and the Itza Maya southeastward in the peninsula of Yucatan and the highlands of Guatemala and Honduras. These two nations, roughly contemporaneous between about 1000 B.C. and 1000 A.D. and in close geographic proximity, reveal to research an increasingly perplexing relation of cultural development, although they can scarcely be thought of as parallel.

The Toltecs built their civilization upon the earlier achievement of people who, for want of better identity, archaeology must speak of as archaic. We are told that the Toltecs had two myths of their coming to this area, which were preserved by their Aztec successors. One of these tells of their descent southwestward from the Gulf coast in the region of the Panuco river; the other gives their direction of origin as from the northwest rather than the northeast. As Gallop suggests in his discussion of the ancient monuments of Mexico, * these may not be mutually exclusive but may record successive invasions of peoples who became amalgamated into the Toltec civilization. The language of the Toltecs was Nahua and not related to the peoples to the northeast, who speak today a dialect.

of Maya. All later invasions of Mexico by the uncultur-
ed Nahua hunting-tribes, including the Aztecs, came from
the northwestward. But early architectural remains seem
to indicate a strong relation between the Valley of Mex-
ico and these peoples to the east. Some of these invas-
ions probably infused new life into the original archaic
civilization, and a Toltec infiltration from the north-
east may have given it some of its more highly developed
culture. If so, then we may follow Gallop as he quotes
Mr. Robert Manett, "the archaic culture was the soil, the
Nahua the fertilizer and the Toltec the seed, yielding
the rich harvest of the Toltec civilization."

The Maya progenitors appear to have moved southward
into their final location from the neighborhood of the
river Penuco near the modern city of Tampico, if we can
accept the hypothesis of Dr. Morley. As he states it:

"Before developing their calendar, chronology, hiero-
glyphic writing, and distinctive civilization, by which
they were characterized in later times, the great mass of
the stock moved south, leaving behind, perhaps, the more
backward elements, who later developed a far lower and
different culture but who continued to speak the mother
Maya tongue, and who later became the Huasteca of historic
times."

Morley's hypothesis is based upon certain linguistic

*Morley 1920, p. 407.*
and archaeological evidences. The Huasteca speak a
dialect of the Maya language, but have no archaeo-
logical evidences that show any likeness to Maya
artistic development. His conclusion is that linguist-
ically they must have a common origin, however remote;
but culturally considered, they were separated before
the Maya developed his civilization.

The Tuxtla Statuette, a small nephrite effigy
found in San Andres Tuxtla, in the state of Vera Cruz,
Mexico, bears an inscribed date in the Maya chronologic
system earlier than any other Maya date so far known.7
San Andres Tuxtla lies about half way between the Huas-
teca area and the earliest dated Maya ruins, at Uaxac-
tum; and in an area otherwise showing no later Maya
remains. In these facts, coupled with the obviously
archaic nature of the Statuette, Morley sees evidence
to indicate the region in which the Maya first began to
record his chronology.

Furthermore certain linguistic and archaeologic in-
dications in the Totonac area just south of the Huasteca
area would indicate a relation to the Mayan.

If these indications are valid and the people on
the Gulf Coast were the early progenitors of the Maya
civilization, then the Toltec culture might have deriv-
* This statuette is dated in the Initial Series 8.8.2.4.17. See Morley, 1920, p. 403.
by evaporating the sample in a glass dish instead of a copper dish better checks were obtained. In 1925 Cooke devised the steam over method in which samples were evaporated in silica or glass dishes by steam in a steam atmosphere. This method gave reproducible results and proved very useful.

Later developments in the determination of gum in gasoline include a method in which samples are evaporated in an oven with a stream of gas (air, steam, or manufactured gas) blowing strongly over their surfaces; the method of Norris and Thole in which the sample is passed a drop at a time into a glass evaporating coil thru which a stream of nitrogen passes, giving the sample instantaneous evaporation; the method of Hoffert and Claxton whereby oxygen at a definite rate is bubbled thru the sample under observation and the gum thus formed dried and weighed; the method of Voorhees and Eisinger whereby the sample is put in a flask surrounded by steam and subjected to an initial oxygen pressure of 1.5 atm. gage - the fall of oxygen pressure in the flask giving the rate and extent of the oxidation of the sample and hence the tendency of the gasoline toward gum formation;

4. Report of the Joint Committee of the National Benzole Association and the University of Leeds (1929)
5. J. Soc. Automotive Eng. 24, 584 (1939)
upon the evidence available to us, I believe we may
grant fairly to the Itza Maya the highest artistic
and intellectual attainments after their settlement
and activity in their respective geographic areas.

The Aztec, settling upon the earlier civilization
of the Toltec, developed a mighty military organization
and enjoyed the bounties of Toltec and Maya cultures.
But the gain was, in architecture at least, one sided.
In his failure to develop that heritage the Aztec must
---at least in the knowledge of present excavation---
be of inconsiderable importance in a discussion of
American architecture.

In the Peruvian Sierras, the Inca was welding the
communal systems of scattered culture centers into a
mighty empire, which, if it did rule with strict laws
every phase of the political and social life of the
peoples, probably did so in a manner well suited to
their temperaments and interests. Building was not the
least of the accomplishments of these people. The
great defense fortresses across the valleys about Cuzco,
the massive polygonal stonework of the pre-Inca structures,
the coursed and bonded masonry of the Inca and his system
of aqueducts are accomplishments which cannot fail to ex-
cite genuine approval. And those huge stone structures
atop the crags of the Andean heights have an appearance of
being agreeably in-place. But his works ever lack the
aesthetic refinement which one likes to see in the
best, and his intimate buildings, in palace and civic
center, are likely as well equaled by some of the
Pueblo tribes of our southwestern states --pictures-
que and colorful but sustaining description little
further than this.

It is among the cultural achievements of the Mayas
in the peninsula of Yucatan that we are to find archi-
tecture at its height among the aborigines of the Ameri-
cans. Here architect and artisan raised the limestone
of Yucatan into an architecture really worthy of note.
The words of Diego de Landa remain to us as probably the
only recorded picture of Maya architecture in the full
glory of its unruined state: "If the number, grandeur,
and beauty of its buildings were to count toward the
attainment of renown and reputation in the same way as
gold, silver and riches have done for other parts of the
Indies, Yucatan would have become as famous as Peru and
New Spain have become, so many, and in so many places,
and so well built of stone are they, it is a marvel;
the buildings themselves, are the most outstanding thing
that has been discovered in the Indies."

In those buildings of limestone, after ten or more
centuries of decay in the tropical jungle, there still
* Gates, Wm., Landa's Yucatan, 1887, p. 35.
gleams something of the sparkle of genius, something which challenges our attempt at understanding and evaluation. Upon first acquaintance the finer examples of the Maya architecture are likely to surprise from us our approval; further study on my part has led to a genuine respect for the Maya architect and a deepening approval of his work.

If we seek the real worth of any great architecture in the aesthetic expression of its materials, principles, and usage in their cultural setting, then the Maya architect attained in some measure to true greatness: found high aesthetic expression of Itza Maya cultural attainments in structures of limestone and lime concrete — as they were used, a plastic material conceived in monolithic construction and surfaced in fine ornament. It is this study and presentation of Maya architecture which will occupy the pages of this paper.

To make such an analysis as this of an architecture in progress of development today, offering the advantages of unlimited evidence and complete dependable historic data, would of itself be a difficult task. In Mayapan the task is further complicated by the ruined condition of the structures available to study and by the uncertain nature of the very brief historic outline at our disposal.

Whatever may have been the cultural and social state of Mayapan when Spain set foot in the Americas, I believe
we can attribute this architectural and historic obscurity largely to the intolerance, greed, and exploitation which characterized Spain's conquest of the new world.

Spain, under Philip II was interested in the gaining of new wealth, not in the recognition of the cultural achievements she found evidenced in the lands of her conquest. Resting her authority in the 'keys of Peter' and the principle of divine regency, she meant to leave nothing undone that would lead to the conversion and complete subjugation of these newly conquered peoples. Much of Maya civilization which might have been preserved was destroyed in religious zeal as 'works of the devil.'

After the Francisco de Montezos -- father, son, and nephew in a warfare of fourteen years -- had brought the peninsula of Yucatan under military subjection, the church began the conversion of the natives to Christianity. In this church inquisition there is one figure who stands out on the pages of its history and in whom we may typify it; this is Diego de Landa. We read in Gate's introduction to his translation of Landa's *Yucatan* that "ninety-nine percent of what we know of the Mayas today we know as the result either of what Landa has told us ... or have learned in the use and study of what he told.

"If ninety-nine hundredths of our present knowledge is at base derived from what he told us, it is an equally safe statement that at that Auto de fé of 1568 he burned
ninety-nine times as much knowledge of Maya history and sciences as he has given us in his book.

"The position of Diego de Landa in history rests on two of his acts, one the writing of the book (Relacion de las Cosas de Yucatan) and the other the famous Auto de fe of July 1569 at Mani, at which in addition to some five thousand 'idols', he burned as he tells us, twenty seven hieroglyphic rolls, all he could find but could not read, as works of the devil, designed by the evil one to delude the Indians and to prevent them from accepting Christianity when it should be brought to them. Both acts are monumental, one to the ideas of his times, and the other as the basis and fountain of our knowledge of a great civilization that has passed.

"It is also quite fair to add that it is to Bishop Toral, a man of wholly different character, who arrived in Yucatan on the very heels of this event at Mani, released the prisoners Landa had incarcerated and forced Landa's own return to Spain for trial before the Council of the Indies that we actually owe the present book (Landa's Yucatan). For it was written in Spain as a matter of self support."

In his book Landa upheld his own actions and denounced Toral. His action was "condemned severely by the Council of the Indies, but his case was referred to a

* Gates, Wm., 1937, pp. XII-XV.
committee of learned doctors, including his own Tomás López, and after the necessary delays, he was absolved."

He returned as bishop to his provinciate of Yucatan in 1573 as successor to Bishop Toral "(who had been so unable to make headway against the dominating Franciscian friars entrenched in their great, Indian-labor built structures, that he had at last retired back to Mexico);" Landa continued with reservations his earlier program until his death in 1579.

Landa's example set precedent for the exploitation which has been continued for centuries under church and lay authority until the Maya has been robbed of the lost connection with his lost estate. To read a passage of a Maya text written in the letters of the Spanish alphabet to represent Maya sounds, "The Indian hears not through the ears but through the back." ** In this Indian, deprived of religion, sciences, and social order — slavery and cruelty having wiped out the ah-miatzil (scientists) and chilanes (proclaimers), and 'holy men' of the Itzas — their still struggles something of his spirit groping for understanding of his lost heritage. If revolt and unrest today witness the unshackling of his bondage, it attests to the virility of a still strong racial stock in spite of determined Spanish efforts to render the past on

* Gates, Ma., 1937, III-XV.

TABLE I

<table>
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<tr>
<th>Temperature of inlet methane</th>
<th>Temperature of evaporation coil</th>
<th>Gasoline evaporated</th>
<th>Time</th>
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<td>C</td>
<td>cc.</td>
<td>min.</td>
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<tr>
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<td>290</td>
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<td>0</td>
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<tr>
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<tr>
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<td>9</td>
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<td>260</td>
<td>50</td>
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<td>286</td>
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<td>66</td>
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TABLE II

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<th>Sample number</th>
<th>Gum per 100 cc.</th>
<th>Factor</th>
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<td>copper dish method 100° C</td>
<td>Norris-Thole method 160° C</td>
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<tr>
<td>1</td>
<td>0.0055</td>
<td>0.0003</td>
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<tr>
<td>3</td>
<td>0.0035</td>
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<td>0.0405</td>
<td>0.0015</td>
</tr>
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</table>
had undoubtedly been committed to memory and transmitted by word of mouth, and a part evidently copied from the codices then in existence in spite of the Franciscan effort to destroy them. There were many of these books, distinguished from each other by the name of the town in which each was kept. Of these a few remain, but three in particular are valuable to us: those of Chumayel, Tizimin, and Mani.*

The codices were books in which the Maya wrote, in hieroglyphic characters, concerning their histories and ceremonies, the order of their sacrifices, and their calendar. These books were made from aguacay leaves or of parchment made from deerskin and surfaced with a lime sizing. They folded so that they appeared as quarto volumes and were fastened between two wooden covers which protected them. Three of these have been preserved to us: The Codex Dresdenensis, in the Royal Library in Dresden, the Codex Tro Cortesianus, now in the Museo Arqueologico National of Madrid, and the Codex Peresianus, in the Librairie National in Paris. With the exception of the hieroglyphs pertaining to the calendar and numeration and some few other glyphs, these three codices are to us so many unreadable pages of Maya history.

With the knowledge of Maya numeration and calendar system afforded by the writings of the Spanish and the

* Roys, Ralph L., the Book of the Chilen Balam of Chumayel, 1933
readable material in the codices, it has been possible to interpret the dates recorded in hieroglyphic inscriptions on many ruins throughout Mayapan, and thereby date these sites.

The third source of Maya history, the relative chronology revealed by the excavation of the ruins of Mayapan in the light of the two previous sources, is to a certain extent, purely hypothesis. This is particularly true concerning the period of the 'transition,' supposed to be one of migration northward and transition between the Old and New Empire styles. The success of further study and elucidation is in a large measure dependent upon the excavation and analysis of the numerous sites in Mayapan. In this excavation the archaeologist is working in a field which has a high value as architecture alone. In this manner the architectural analysis of these excavated ruins comes to have a double worth, and between architecture and historical research there exists a mutual dependence.

No more in architecture than in history was Spain interested in preserving Mayan achievements. Landa's words, "while I was living there in a building we were demolishing ..." suggest that many of these buildings may have served as stone quarries for the Spanish churches. Certainly the bas relief which decorated their walls, the stone serpentine columns, and frescos were symbols of the 'iniquitous idolitry' which Landa made such effort to destroy at Mani,
and may well have suffered the same fate.

Evidences reveal the intentional defacement of many of these structures throughout the Maya area. Whether this was the work of the Spanish priests or of superstitious vandals since is of less vital concern than the Castellian exploitation which began under Spanish and continued under Mexican authority. The consequent neglect has allowed the tropical growth which has reduced this architecture to its present state of ruin. Prying roots, falling timber, sun, and rain have done their work so well that what were once monuments of architectural grandeur are today shapeless mounds of rubble.

Archaeology has set itself the task of recovering to us as much of this Maya heritage as may be available after the decay of centuries.

Interest in the Mayas was probably first stimulated by John L. Stephens. On a diplomatic mission to Honduras for President Van Buren in 1839 he found the several cities he visited after the completion of his duties of compelling interest and wrote the account of his travels, Central America, Chiapas, and Yucatan, 1841. In 1843 he was commissioned by the United States government to explore Yucatan, and his book, Incidents of Travel in Yucatan, 1843, followed. Stephens was accompanied and supplemented by Frederick Catherwood, and English
architect, whose drawings in lithograph of the several ruins visited are the finest we have today.

Very little of import followed until the works of A.P. Maudslay from 1881 to 1894 were published under the generosity of F. Duncan Godman and Osbert Salvin, the editors of the *Biologia Centrali-Americana*.

The Peabody Museum, Harvard University, through the instrumentality of Mr. G.P. Bowditch, sent four expeditions into the field from 1891 to 1902 to study the great southern cities, and more expeditions were to follow. These studies directed by Marshall H. Saville, John C. Owens, Dr. George Byron Gordon, Osbert Salvin, and Dr. A.M. Tozzer promised to develop in intensive study the work begun by Maudslay. Unfortunately, however, these operations were cut short after the fourth expedition by a change of government in Honduras. In 1910, Mr. Bowditch published the more important results of his researches in the field of the hieroglyphic writing of the Mayas, *The Numeration, Calendar Systems and Astronomical Knowledge of the Mayas*.

Dr. H.J. Spinden's stylistic analysis, *A Study of Maya Art, its subject-matter and historical development*, published by the Peabody Museum in 1912, and based upon the monuments of the southern cities has quickened chronological coordination over the entire area.

Dr. S.G. Morley began at Copan in 1910-1912 in be-
half of the School of American Archaeology and continued
in 1915-1917 in the interest of the Carnegie Institution
of Washington the work which led to the publication of
the wealth of valuable material in his *Inscriptions at
Cupen, 1920.*

Work in the northern portion of the Maya area, par-
ticularly at Chichen Itza was prompted primarily by the
interesting explorations of Mr. Edward H. Thompson, who
made his home in the hacienda at that site. Since Thomp-
sen first began his work, relations with the government
of Mexico and uprisings of some of the Indians along the
cost have hampered progress on occasions, but these
slight troubles have been happily settled.

Excavation, restoration and study at Copan, Uxactun,
Chichen Itza, Tulum, Coba and various other sites have
been carried on by the Carnegie Institution of Washington,
by Tulane University of New Orleans, by the Peabody Museum,
Harvard, by the Archaeological Society of Washington D.C.,
and by the Mexican government.

There are an increasing number of workers in the
archaeological field of Maya even whose endeavors add constant-
ly to the material now available. Among these are Dr. Um.
Gates, Dr. Thomas Good, J. Eric Thompson, Karl H. Morris,
Robert Suchope, Lawrence Noyes, Ledyard Smith, Dr. George
C. Shattuck, Oliver Ricketson Jr., Harry D.D. Pollock, Samuel
K. Bothrop, Karl Ruppert, George Oakley Totten.
The land of the Mayas -- a knob on the long arm that joins North with South America, crossed almost in the center by the 89° meridian and the 18° parallel -- stretches from the highlands of Mexico and Central America northeastward, a flat limestone plain, low in the waters of the Gulf and Carribean, warm and rich beneath the tropical sun.

This land the Maya knew by such names as Uluumil euz etel oeh, "the land of turkeys and deer," and Cohua, "broad bread" or "land of plenty." The latter of these was in common use at the time of the Conquest. Cogolludo writes, "this province or kingdom of Yucatan did not have one common name by which they knew its boundaries and territories because as it was subject to different lords .... each one placed his name to the different parts where he lived .... But formerly it had all been subject to one lord and king .... and so all this land used to be called Mayapan."* This probably referred to the League of Mayapan in the northern part of the peninsula during the federation where there was also a city of the same name. For convenience I shall refer to the entire region

* Found in Lothrop, 1924, p. 10.
occupied by the Itza Maya civilization during the period in which they developed their architecture as Mayapan, or the Maya area. This includes the peninsula of Yucatan and the highlands at its base lying in the state of Chiapas, Mexico, and in Guatemala and in the northwest fringe of Honduras.

In the highlands to the south the mountains rise abruptly to great heights and tumble away again into deep, picturesque gorges. There are clear, rushing rivers, and heavy rain forests of zapote, mahogany and Spanish cedar, hanging with moss and vine and all the rich flora of the tropics. It is the haunt of the deer and the jaguar, the monkey, the boa, and the rattlesnake. This tropic growth gaps here and there into broad open valleys or natural limestone acropoleis that sparkle in the setting of green jungle all about; it was in such spots in this area that the Maya architect planned his cities.

In addition to limestone there abounds in the southwestern portion of this region in Honduras a volcanic tuff which is the result of continued volcanic action that layed down ash in water. This tuff was fine for sculpture work, although it contained hard inclusions which often made flaws.

As one moves northeastward along the axis of the peninsula, the mountains drop to broken hills and finally
give way entirely to the flat and somewhat choppy limestone plain in the north. This plain is broken as far north as the 20 parallel by a series of worm-shaped ridges varying between four hundred and nine hundred feet in height. The surface limestone that forms the crest and slopes of these hills is a fairly compact reddish limestone. At intervals along the base of these hills occurs a brecciated limestone.

The peninsula north of the 20 parallel is very level and flat, sloping gently to the Gulf at the rate of about one foot per mile, Merida being about twenty-eight to thirty feet above sea level. The limestone over this area is a grey or white shell formation, semi-crystalline or highly indurated in local areas, but, where less compact, it is a mass of loosely united shell. Sascab, or white earth, a sort of breccia or conglomerate is found beneath the cap-rock in this area.

In southern Campeche, at the base of the peninsula, several rivers empty into the Laguna de Términos on the west coast, among which is one of the three mouths of the Usumacinta, which extends nearly across the base of the peninsula. On the east coast and slightly farther north, the Rio Hondo empties into the Bahía de Chetumal. In the central portion along the east side of the north-south axis lies a chain of several lakes. The southernmost is Lake Petan in Guatemala. Approximately one hundred and
fifty miles north, and probably better known, is Lake Bacalar. But movement northward from the southern highlands is marked by a decrease in surface water. The soil of the northern peninsula, a red earth formed by the decomposition of the limestone in this area, is but a thin covering over the porous limestone through which the rains percolate almost immediately. Thus, the largest portion of the peninsula, has no rivers and few lakes, the small group of lakes at Coba being probably the only ones in the extreme north plain.*

In the arid parts of the peninsula, the procuring of water is a grave problem. For household uses and drinking it was obtained by the Mayas from three sources. Rain water was stored in cisterns and aguadas. In some areas on the northwest coast shallow dug wells and springs deep in natural caves gave a dependable supply.** On the north plain there are a few large natural wells or cenotes, formed when these caverns in the limestone caved in. It is also told that along the north coast, springs discharge fresh water from under the sea and even at great distances from the shore it can be dipped up out of the Gulf. For water for their crops of beans and maiz, the Maya prayed to the rain-god and offered sacrifices.

* Shattuck, 1933, pp. 8, 14, 9 and Morris, 1931, p. 223.
** Stephens gives an interesting description of his descent into one of these caves. 1843, Vol.2, pp.11, 31.
The whole of the flat plain of the peninsula seems to be a vast limestone table supported on limestone columns, so eroded is it beneath the surface by the percolating through of rainwater. In this great system of caverns the water stands at an approximately constant level, varying some with the tides in the Gulf and Caribbean, drifting northward, generally. Where open cenotes occur the distance of the water level below the ground surface is very nearly equal to the altitude of the place above sea level. In some of the caves on the northwest plains, it is said one can wander far under the surface in endless passages.

As noted, the soil layer grows thinner and thinner as one travels northward from the base of the peninsula. There is also scantier rainfall to the north. In consequence of these two factors, the deep, rich rain forests of the southern portion decrease somewhat as one moves northward along the Caribbean coast to the Coba region. Then the trees lose height and girth sharply as one moves westward to Progresso.

Along the southern stretch of the east and west coasts at the base of the peninsula the land lies low in swamp and marsh — and timber in some areas gives way to weeds and swamp grasses. Limestone is scarce and is replaced only by loose shell in the region of the Laguna de los Terminos on the west coast. Insects and generally unhealth-
ful conditions prevail.

The temperature over Mayapan is of course tropical, but it is not unduly exaggerated except in some areas. The heat and dampness of the central lowland area of the peninsula is excessive most of the time.

The northwest plains are dryer and more sunscorched than any other portion of Mayapan. As there is little temperature change from summer to spring to summer the year divides itself into two seasons: rain and dry. The wet season extends roughly from June to January, and the dry from February to May; local variations make these periods more nearly even in some localities. Although the average precipitation and the longer rain season combine to make rainfall much heavier in the south highlands, the climate, nevertheless, is more healthful there.

Morley writes of the region about Copan: "The climate is salubrious for the tropics, the elevation being such as largely to eliminate the excessive humidity of the coast plain -- the mornings and evenings are always cool and refreshing." Along the Caribbean shore line, cool sea breezes temper the heat and make the shade pleasant even at midday.

* Morley, 1920, p.2.*
Before attempting to follow the movements of the Maya over this tropical 'land of plenty,' let us consider first that he was essentially a communal agricultural people, his chief food staple maize. A knowledge of the milpa system he employed will afford an understanding of his cultural history and of the general nature of his civic planning.

"The Maya method of agriculture," Gorley tells us, "ancient as well as modern may be briefly summarized as follows: cutting, burning, planting, and sometimes weeding. As soon as the rainy season is over a new piece of forest is cleared, usually in January or February, and the fallen trees and underbrush are allowed to dry under the fierce heat of the March and April sun. When sufficiently dry to burn readily, usually in March and not later than April, a clearing is burned.

"Throughout the Maya area, north as well as south, the skies in April are covered with a pall of smoke, the sun setting each night a ball of fiery red. It is the time of the milpa (cornfield) burning, just before the end of the dry season.

"After the first rains, usually during the first half of May, the corn is planted among the fallen, charred trees, some of which are not entirely consumed. A sharpened fire-hardened stick is generally used, and the corn is planted five to seven cm. deep. In some places weeding is practic-
ed, in others not, the burning being deemed sufficient to retard the growth of weeds until after the corn has had a good start. The harvest is usually not garnered at all. In August, when the corn is ripened, the ears are bent down and left hanging on the stalks to be garnered only as they are needed in some cases being left on the stalks until the end of the dry season, when the last are picked and brought in. This method of harvesting is not as casual as it first appears, since the ears are much less subject to attack by insects, decay, etc., when left hanging on the stalks in the open air than when they are picked and stored in floorless thatched huts, where deterioration from all causes is more rapid.

"Whatever may have been the practice in ancient times, today the same field is not usually put under cultivation two successive seasons; but a new piece of forest is cleared and the same process repeated. This is done because the second season's crop from the same field is from 40 to 50 percent less than the first season's yield, and the natives, as a rule, prefer the larger return even at the cost of the greater labor involved in clearing new pieces of forest each year.

"After lying fallow from two to five years, and in some places even seven years, sufficient trees and bushes have grown up in a clearing to permit its being put under cultivation again, and then the same process is repeated
and the cycle of milpa rotation is complete."

Gates tells us that to afford sufficient area for this practice each town-unit had its town-owned communal districts near enough to and sufficient for the town to whose members belonged the right of use. This was true during the period of Maya history of which we have record, and probably of the time of the Old Empire.**

Such a communal system revolving around the hub of its religious and civil activities would have required some such civic plan as archaeology reveals today was characteristic throughout Mayapan. At its center were grouped temples and courts, planned to accommodate the varied and elaborate ceremonies which characterized its religion. In convenient relation to these were probably such residences and other structures as befitted the priesthood and lords and accommodated their activities. Grouped about this center in clusters were the stone and wood and thatched houses of the main body of the people. The tropical climate prevalent throughout Mayapan made these somewhat open huts very desirable. Lying outside of this area, and stretching out into the mountains for some fifty miles perhaps, were the communal lands, limestone quarries, and the forests where turkey and deer and much small game could be found.

When one of these city units in its normal growth re-

** Gates, 1937, p. xiii.
quired lands so extensive that the distance at which many of these milpas lay from the hub was excessive, a new hub was formed. The location of this was very likely some desirable locality designated by the priesthood and adjacent to the outlying milpas. The distance at which it was convenient for a milpa to lie from its hub may have been relatively small, possibly as great as fifty miles, for the Maya had no pack animal or wheeled vehicle and was obliged to walk the distance to his milpa and return, carrying his load of maize on his back.

In such a manner, very likely, this civilization spread from its beginning in South Mayapan throughout the entire peninsula.

Much of what we know of the history of this people has been determined by a study of their hieroglyphic system and its revelation of their numeration and calendar and the stylistic development of their art. It is in terms of these that Maya history can best be presented.

The written language of the Maya was a hieroglyphic system which reached a high degree of development.* As far back as we have any trace of the Maya race, this system, in its essentials at least, was in use. Through—*Brinton and Bowditch have expressed their views that these picture writings and ideographic symbols also represented phonetic syllables — the rubus form.
out Mayapan many inscriptions on stone, wood, and stucco are found, some certainly cruder than others, but in principle they show themselves to be the same system.

Unfortunately we are able to read few of these glyphs except those which record the passing of time. The archaeologist hopes that possible in the cave of some Spanish padre or Maya priest there awaits excavation such hieroglyphic passage and Spanish translation as would give a key to the reading of these other Maya glyphs, or that to the north in the Hunatco area there may be uncovered some stone bearing inscriptions in both Maya and Aztec.

With the Maya system of numeration we are better acquainted. The Maya had two different ways of writing their numbers: one with glyphs representing different types of the human head, the other with bars and dots.

In using the first, the numbers one through thirteen were expressed by thirteen different head glyphs; by adding a certain characteristic of the glyph ten, a fleshless lower jaw, to each of the glyphs three through nine, the numbers thirteen to nineteen were obtained. The glyph thirteen, as can be seen from the above, could be represented by a simple, individual glyph, or by the compound- ing of glyphs ten and three.

The simpler system, counting by dots to five, which was represented by a bar, gave, by additions of bars and dots, the numbers one through nineteen.
Either of these, used in a place system, readily gave large numbers. The place system used in time count, and undoubtedly influenced by astronomical observations, was vigesimal, except that proceeding from the second to the third place, the number eighteen was used to make the third place equal 360, very nearly the length, in days, of one solar year.*

This mathematical system and knowledge of astronomy allowed the Maya to develop his calendar to record passing time with great accuracy.** Morley writes:

"The Maya priesthood, in whose hands exclusively rested the knowledge of the hieroglyphic writing conceived time more elaborately than any other people the world has ever known at a corresponding stage of general culture. They observed and recorded its more obvious phenomena, the apparent revolutions of the sun, moon, and probably other planets, solar eclipses, planetary configurations; and, most important of all they accomplished its exact measure: the accurate toll of the passing days."***

The Maya had several methods of counting time: the 'year count'; the religious year, which made possible the 'fifty-two-year count,' or 'Calendar Round'; and the 'long

* Pure vigesimal system used in merchandising cacao. Landa, p. 40.  
** The Maya used zero in his calculations more than 1000 years before its introduction into Europe. Ricketson Jr., p. 1.  
*** Morley, 1920, p. 34.
count. Common to them was the continuity of the day series, the never ceasing cycle of the twenty day-names.

The Maya year, a 365-day solar year, was composed of eighteen twenty-day months followed by a short five-day period at the end. Each of the twenty days had its name, or glyph character, and the first day followed the last when the twentieth day was reached. This series continued uninterruptedly in a never ending cycle. Each month had its name, and the eighteen months followed each other consecutively as did the days, except that the five-day period at the end of the year always separated the last twenty-day month from the first, and made the first day of the new year, and every month thereafter, fall five days later in the day series each time. *

This time count distinguished the twenty days from each other and gave their position in the 365-day period by giving name of day and month, but afforded no means of distinguishing days in a longer period.

The Maya had a 260-day period determined by the application of the numbers one to thirteen consecutively and continuously to the twenty day signs. Here the same day with the same number could not appear a second time until the day following twenty times thirteen or 260 days. **

* See Bowditch, 1910, 'Year Bears,' p.74.
** The 260-day period was the religious year of the Maya. In Mexico it was called the Tonalamatl. Bowditch, p.266.
By associating the 260-day-year with the 365-day-year, the Maya were able to distinguish days in a longer period. Consider a particular day of a period of 260 days, represented by its day-name (one of twenty), and by its number (one of thirteen); consider a particular day of a period of 365 days, represented by the day (a number) of the month on which it falls (one of twenty, or of five of the short month), and by the month name (one of nineteen including the short month); consider the particular day of the 365 days falling identical with the particular day of the 260 days — this would give a day, of a certain month, which would not occur again for a period of fifty-two years. This fifty-two-year cycle is called a 'Calendar Round.'

A given date of the 'Calendar Round' will appear again, then, after the lapse of fifty-two years, but its position can be fixed with perfect certainty from a fixed zero or beginning point somewhere in the far away past by means of the 'long count.' It was in this count that the Maya chronological system was employed. Each higher place in this system (vigesimal, except in the third place) represented a corresponding division in the long count. Each of these divisions was known by a name and represented by a glyph. By affixing bar and dot numerals to each of these glyphs as they occurred in this place system, he was able to represent a given date from a fixed starting point.
When nineteen kins were completed from the zero point, the kin place returned to zero and the uinal place increased by one; when the uinals reached eighteen, the uinal count returned to zero, and the tun record became one greater, marking the lapse of 360 days; the close of the nineteenth tun marked one katun; and a period of twenty katuns was recorded by a zero in the katun place, and an addition of one in the cycle place.

In the inscriptions the different time values were denoted: by their position in the place system, by a glyph denoting the kind of period represented by that place, by a number showing how many returns unto itself had elapsed since its last zero count, and by the accompanying 'Calendar Round' date. These are usually read from left to right and top to bottom, and occur in a double column introduced by an Initial Glyph from which the date takes its name, 'Initial Series.' These dates are generally noted as follows: 10.8.0.0.0 3 Ahau 3 Chen. This gives the total number of days elapsed since the zero point as 10 cycles, 2 katuns, no tun, no uinals, no kins.

*Names generally given to Maya time periods: k'IN, day; uinal, 20 kins; tun, 20 uinals (360 days); katun, 20 tun; cycle, 20 katuns. Bowditch, 1910, p. 275-284.*

** In the inscriptions a glyph representing grand cycle, consisting of 20 cycles (in codices 13 cycles) is found.

***Morley, p. 31; Bowditch, p.25,122.***
kins, ending on the given day of the 'Calendar Round'
3 Ahaü 3 Chen. A date thus recorded is absolutely fixed
in a period of several thousand years.

Had the Maya used this Initial Series count in its
complete form on all his inscriptions up to the Spanish
Conquest, there would be no problem of correlating dates;
but this was not the case. Previous to the closing dates
of the Old Empire cities of the south, this method had,
in some instances, become abbreviated, recording only the
position of a date in a katun, thus: 3 Ahaü 3 Chen, end
of Katun 2. In the New Empire cities, with few exceptions,
only tun-ending dates were given, and these often gave
only the day-ending-name without the corresponding month
parts. Such dates as these are referred to as 'Period
Ending' dates.

These abbreviated forms have made their point of
contact with the Initial Series dates of the Old Empire
cities most difficult to establish. Any discussion of the
history of Maya cultural and artistic development as a
continuous program is contingent upon such a relation.
In view of this, several systems, all tentative, of corre-
latating these two periods of Maya history have been pro-
posed. For the sake of uniformity throughout the text,
I have elected to use Morley's correlation which places
Chichen Itza contemporaneous with the closing dates in the
south, thereby agreeing with archaeological evidence at
Chichen Itza and with certain documentary evidence in the Books of the Chilam Balam.

This date sequence, coupled with the stylistic art sequence established by Spinden, has quickened chronological study throughout Mayapan.

It the exact correlation of this Mayan chronology with our Gregorian calendar could be effected, the age of these cities of Yucaten could be ascertained with more accuracy than the age of any of the Old Empire cities of antiquity. Morley hopefully writes:

"...it appears that actual astronomical phenomena of determinable nature are recorded in the Maya inscriptions; and it only awaits the exact identification of any of these, such as any particular solar or lunar eclipse which was visible in northern Central America during the first six centuries of the Christian era, for example, to make immediately possible an exact correlation of Maya chronology with our own Gregorian calendar."

The dates recorded in the manuscripts written since the Spanish invasion (a series of the ending days of the succeeding katuns) occasionally refer to events of which we likewise have record. These dates allow us to designate the time position of Maya civilization in terms of our Christian chronology. By this means Morley places cycle nine of the Maya era as corresponding to 176 A.D.

"Morley, p. 405."
It was in 1920 that Morley proposed his correlation along with other tentative schemes of that time and earlier; these are still in use pending exact correlation by means of astronomical data.

The calendar of the Maya seems to have been intimately bound up with his religious beliefs, as were his astronomical observations and his communal agricultural system — in fact the whole of his social, cultural, political life.

The Mayas were a tribal people, and their gods were largely tribal gods; yet, the broader, more general racial traits were present, underlying and uniting the tribal pattern of Mayapan.

Each locality seems to have had its priesthood and religious civic center. Under the guidance and direction of the priesthood the cultural nucleus of the Maya communal life developed. These priests were divided into several different groups: the high priest, Ahkin Mei, or Ahukan Mei, whose office was hereditary, and who nominated the local clergy after examination in divination, writing, and calendrical interpretation; the oracular priests, Chilanes, who declared the will of the gods; the sacredotal and military priests, Bacones, who officiated at sacrifices and from among whom the military leader for a three year period was elected; and the priests, Chacs, representing the Bacabs or year-bearers, four of whom officiated at a

time. Ceremonies were performed much the same everywhere. The continued renewing of the several time cycles was accompanied by elaborate ceremony.

The beginning of each new calendar year was prepared for during the short five-day month preceding it by fasting, house-cleaning, renewing and repainting all utensils, and by the observance of civic religious ceremonies which involved the extinguishing of all fires, and the relighting of new ones. Renewal of longer time periods probably included the replastering of their buildings. Longer periods were also marked by the erection of monuments. Morley says these "period-markers were in effect, 5, 10, or 20 year almanacs issued at the ends of these respective periods, which covered important matters that had come to pass therein, or even earlier. . . . At first the hotun-endings (5 years) were marked by stelae exclusively, but later, as at Quirigua for example, low boulderlike stones were used, the so-called zoormorphs, and elsewhere even small altars, and finally, toward the end of the Old Empire, when the Maya were truly at their cultural zenith, their esthetic and intellectual apogee, whole temples were dedicated, especially at the katun-endings..."

It is through a study of these monuments, period markers that they are, that a date sequence and a stylistic art sequence have made possible the chronological framework...

* Morley, p. 570.
used in a study of the history and architecture of these people. Among the subject matter on these structures are found the portraits or symbols of the gods they worshiped; agricultural divinities, and tribal deities.

The agricultural divinities were of primary importance in all the tribes. Prayers were given and sacrifices made in behalf of a special maize-god befriended by Chac and other benevolent powers, and persecuted by the lord of the underworld and the animals that plunder the crops. Chac was the chief thunder god, and was associated with agriculture and rain because thunder in the tropics is accompanied by rain.

Among the tribal deities were gods of culture, arts and letters, medicine and magic, gods of singing, and a god of gems; war gods, sacrificial deities, god of the underworld and the death god, gods of travelers and traders, of hunting and fishing and bee-keeping, and many others. It seems that the priests worshiped gods unknown to the populace. These tribal gods were sometimes worshiped in local regions, but they often become tribal leaders in migrations from one locality to another. Could one but unravel the myths concerning these tribal deities and follow them in their leadership of the people in their various migrations, the thread of Maya history might be traced from one area on the map to another with much less hesitation.

It is in Guatemala, Honduras, and Chiapas at about
the beginnings of the Christian era that we find the earliest traces of civilization in Mayapan; yet, if inscriptions and stylistic evidence allow us to date the buildings found in this southern area as the earliest so far revealed, they in no way suggest or show themselves as the archaic development of Maya architecture. Joyce, who would find in these highlands the region where Maya culture began its early growth and developed its civilization, admits that it appears to have sprung "full blown from the earth." If the hypothesis Morley advances of the Huasteca-area origin of the Maya culture allowed us in an earlier general view of indigenous artistic development to trace it southward to its culmination in the architecture of the Maya, it allows us now to hope that the rich field of research that would be presented in the early developments of Maya culture are not forever lost, but may be traced in the area east of the Valley of Mexico. This period of development prior to the Old Empire cities of the south would throw a great deal of light upon any evaluation of Mayan culture. But that remains a chapter unwritten for lack of the ink of archaeological excavation. Our study must be limited to Mayapan.
Maya history divides itself broadly into three periods:

1. The Old Empire Period in southern Mayapan dating from the earliest times to 10.2.0.0.0.

2. The Transitional Period characterized by a general movement of civilization northward into Yucatan. As early as 9.0.0.0 peoples from the Old Empire cities had probably formed colonies in the eastern and northern portions of the peninsula. After 10.2.0.0.0 the general population seems to have shifted its civic centers to the north where they developed in the final period.

3. The New Empire Period in northern Mayapan began about 11.1.0.0.0, received new stimulus from the Toltec about 11.12.0.0.0, culminated before 12.5.0.0.0, and was finally terminated by the Spanish Conquest.

In the Old Empire cities of southern Mayapan, we find an area densely populated at the beginning of our Christian era. This is evidenced in the many great civic centers where court groups, pyramidal temples, and palaces were built of limestone and ornamented with sculpture and frescos of the finest workmanship.

Artistic development in these cities was rather uniform throughout the entire region and gradual and consistent throughout the five centuries of their expansion.
To treat this as one period of Maya history, however, is to place works of widely different degrees of attainment with the same chronological division, as Morley expresses it, "...sculpture, indeed, as technically and esthetically different as the Apollo of Tenea and the Charioteer of Delphi." For the purposes of closer study, he proposed in 1920 the division of this Old Empire Period into three periods, by the recognition of a Middle Period, "the limits of which are fixed at one end by the first appearance of sustained improvement in technical processes, treatment, carving, depth of relief, and the like; and at the other by the final disappearance of archaism."

Spinden had reached a similar conclusion regarding the sculptures at Copán in 1915. Morley's proposal as it has been generally accepted divides the Old Empire Period:

- **The Early Period** --- Earliest times to 9.10.0.0.0.
- **The Middle Period** --- 9.10.0.0.0 to 9.15.0.0.0.
- **The Great Period** --- 9.15.0.0.0 to 10.8.0.0.0.

In the temples and on stelae, in relief sculpture and in the inscriptions found in these cities it is evident that the Mayas had even at the beginning of the Old Empire Period conceived the essentials of his several cultural achievements. The development of these which characterized his progress throughout the history of his civilization in

* Morley 1920, pp.53,54; Spinden 1917, pp. 130-132.*
Mayapan was in the main part a refinement and perfection along such lines of endeavor as he had set himself in this early period.

The available sources of written historic material -- the Maya writings in the books of the Chilen Balam and the writings of the Spanish -- make little mention of this early period and what is said is more of the nature of legend than of recorded history. These legends and later customs suggest that the social government was well established, and probably took the form of independent city states. Their rule rested in chiefs or lords and was passed down from father to son. These sons of the chiefs received training from the Itza priests, and often entered the priesthood themselves.

These Itza, according to the books of the Chilen Balam and evidence to be found in the symbolism of many inscriptions, were at least one group of the sacerdotal class during the new empire. In legendary references much of the early cultural achievements were attributed to them; hieroglyphic writing, calendar, arts, science, the knowledge of planting maize, are mentioned in the praise of the Itza.

By whatever name the priesthood may have been called in early times -- and there seems to be no good reason to name them other than Itza -- it is necessary to an understanding of their architectural development to picture
the Maya as an inherently artistic, if simple and industrious, people, directed in their higher efforts by a more intelligent and aspiring priest class.

Their architecture, then, as a product of cultural aspiration and artistic industry, would be Itza-Maya.

Sometime before the beginning of cycle nine the Itza-Maya had become adapted to their physical environment, and had begun the progress of their cultural development.

The earliest dated monument so far known in Mayapan is at Uaxactun, where stela 9 records the Initial Series date 8.14.10.15.15. Two other cities are known to date from the first part of the Early Period: Tikal and Copan, probably contemporaneous in about 9.8.0.0.0. These three cities were not only the earliest established in Mayapan, but also upon evidence of recorded dates were occupied longer than any other cities in the Old Empire; Uaxactun was occupied for about 492 years, Tikal, 331 years, and Copan, 325 years. *

Uaxactun and Tikal, lying not more than twenty miles apart in what was the most densely populated area of the Old Empire region, may well be expected to exhibit some of the most representative developments of their times. * Excavations at these sites have revealed much earlier activity than that associated with the earliest dated stelas. Morley, 1920, p.7; Ricketson, O.G.Jr., 1937, p.235,234
Copan, approximately three hundred miles to the south of Uaxactun in a very rich and fertile valley, may have been the chief rival of Uaxactun-Tikal throughout most of the Old Empire Period.

During this Early Period, at least three other cities, Piedras Negras, Naranjo, and Alter de Sacrificios-El Pavellón were settled. With these we can see fairly defined the boundaries of the Old Empire region: Copan on the southeastern frontier, Uaxactun-Tikal and Naranjo in the north, Piedras Negras in the west, and further exploration is extending this region into the Usamaccinto Valley.

The structural principles of architecture were well established and demanded a more studied expression of detail than had been possible before, but construction was heavy and lacked the refinement it was to soon develop in technical advance. The desire for an expression of monumentality in these structures led to massive proportions and the great masques and roof combs of Tikal, the monsters in bas-relief on the temples at Copan, and in general the tendency toward the large grotesque ornament that was applied to pyramids and buildings. It should be noted, however, that the fundamental principles of building and ornamentation that were to characterize the development of the Itza-Maya architecture were established, and development was to be progress along these established lines.

By the end of the Early Period stone cutting had be-
core sculpture, a fine art. Technique was showing finish it had not had when the first steles at Copan and Uaxactun were carved, and the proportion of the human figure was becoming more natural and its treatment some freer.

Progress went steadily ahead and several new cities were founded, among which were Palenque, Yuxhilen, and Querigua. Probably all of the great southern cities were founded by the end of the Middle Period except Seibal, which apparently was settled later.

The steady establishment of new cities throughout the Old Empire region and the growth of the earlier ones suggest prosperity and plenty. The ruling caste was well established and well ordered. The Rain-God and the Maize-God had been indulgent and harvests had yielded rich returns. The leisure thus afforded had been well applied to the arts, and stone carving had developed technique which felt its classical assurance and knew no restraint.

So the stage was well set for the climax of the drama: Act III of the three act play, Old Empire.

By the beginning of the Great Period culture in these southern cities was quickly reaching its zenith. The Great Plaza at Copan had been completed and plans projected for the adjoining court of the hieroglyphic stairway and the completion of the courts atop the Acropolis. The whole of which when completed was one of the finest examples of court-and-group planning in the south. The fine civic plans
of Tikal on its three natural acropoleis must have been nearly complete and the imposing grandeur of its massive temples foreseen.

Sculpture had mastered stone and wood. In the Early and Middle Periods hieroglyphic inscriptions had been limited to stelae and altars, but now these long texts, sometimes with their accompanying human figures in bas-relief, were carved on architectural members, door jambs and lintels, stairways, piers and cornices and roof combs were embellished with a rich overlay, and sculpture in its full glory had become the ornamentation of architecture, often so at the expense of architecture, no matter how fine the sculpture as sculpture.

Above these heights, stone carving was never to rise as a separate art; indeed it was never to attain them again in any part of Mayapan.

Activity reached its peak during the middle of this period. Seibal, Le Nonredez, Polol, and several other cities were founded. Art was becoming flamboyant in its attempt to outdo the tropical jungle all about. Stone sculptured in the round and stucco in high relief ornamented temples, palaces, stelae and altars.

If architecture was becoming ornate in detail, however, it exhibited sterner qualities in principle. In the last of the great period technical advances in engineering had allowed thinner walls and lighter vaulting; conservation of labor and materials were the result.
Lighter proportions of temples and palaces and new conceptions of structural principles presented the Old Empire architect with many problems. If sculpture was enjoying the curtain calls of Act III, architecture was only rehearsing Act I of a longer drama, the last act of which was to be presented on the plains of North Mayapan.

Even before the close of the early part of the Old Empire, colonization of northern Mayapan had begun. As early as 9.6.16.0.0 a chain of settlements had been made up the East Coast of the peninsula with its terminus apparently in the region of the Coba lakes.

At Ichpactun, a small site on the shore of Chetumal Bay, a stele records the Initial Series date 9.6.0.0.0, and to the west of Ichpactun lies an extensive Old Empire cemetery which does not evidence its dates and cannot belong to any city as yet known.*

Further north up the coast at Tulum, stele 1 bears the Initial Series date 9.7.0.0.0. A long period of development is evident in this east coast city, the early examples of which possibly show certain close relationships with the Old Empire, while the later advances were seemingly in the van of New Empire progress.

At Coba a long series of monuments bear evidence of extended occupation after the earliest decipherable date 9.9.0.0.0. Her civic planning and the stylistic evidences

* Gann, 1928, p.58.
of the stelae indicate very close development with the cities of the south.*

In the second Katun before the close of the Middle Period in 9.14.0.0.0, word was brought of the province of Ziyaccaan Bakhalal some seventy to a hundred miles north of La Monzadz and immediately west of Ichpakan.* The water at Lake Bakalal was sweet, the lands to the west fertile, and a settlement was made here which lasted until 9.17.0.0.0. "In these 'years' they ruled Bakhalal," as it is written in the Meni manuscript, "it occurred that Chichen Itza was discovered."**

These people had discovered the natural cenotes in the flat waterless plains of north Yucatan—two great wells of cool sweet water about which was to develop the civilization of the New Empire. In 9.18.0.0.0 Chichen Itza was occupied.

The several Ruins in this chain of settlements up the East Coast probably bear a closer comparison with the Peten region than with the other Old Empire cities, suggesting that the settlement of the eastern portion of the peninsula was made from the northeastern portion of


** Chilan Kalam of Meni, Xizinin, and Chunyel.

***Brinton, 1932, pp. 95, 96, 100, and 101; Morley, 1920, p. 457.
of the Old Empire.

A similar movement probably beginning slightly later than the Ixiptum-Tulum-Coba chain is evidenced up the west coast. This movement included the cities Etzna, Juina, and Holactun, and carried into Chichen Itza a second element. Thompson points out many stylistic differences of the monuments of these settlements from those on the east coast, and the close relationship they bear with certain cities in the Copan and Usumacinta regions of the Old Empire."

Thus northern Hesapan was settled by different elements of Old Empire civilization which when they reached the Chichen area were to amalgamate in interesting and vigorous developments the unique individualities of two branches of a common stock which had been separated and had developed rather independently over 540 years.

Sometime about the end of Cycle 9 or the beginning of Cycle 10, the setting up of stelae in Copan stopped. This began the end of the Old Empire, for the other cities followed during the next three Katuns.

Several cities sprung up in 10.6.0.0: Flores, Ucanal, Benque Viejo, but these last cities were short lived, and by 10.5.0.0 the Old Empire came to a close.

Whether or not the early colonization of northern Hesapan between about 9.6.9.9.9 and 9.13.6.0.9, and follow-

* Thompson, J., March 1952, p. 100.
ed almost immediately by the evacuation of certain cities in the south; bears evidence that the Maya foresaw some coming disaster and prepared his exodus can hardly be determined upon the data available at present. It may only have been that the normal expansion of a thriving cultural nucleus was followed by some unforeseen, but nevertheless urgent force which drove the Maya from the southern cities.

The abandonment of south Mayapan appears to have been rather abrupt in each city, but gradual over the region as a whole -- beginning in the south and west and moving progressively across into the north and northeast. Earthquakes, civil wars, invasions, disease, social decay, climatic changes, and the exhaustion of the soil by the milpa system have been suggested to explain why after nearly five centuries of industry and progress the Maya left these cities wherein lay such investments.** Certainly, under normal conditions northern Mayapan did not present so favorable an agricultural environment as did the southern region.

Whatever may be the fundamental cause of the general exodus from the Old Empire cities, that they were abandon-


onced is archaeologically evidenced, and the region was not to be again occupied until when, after the fall of the League of Mayapan in the north, a large body of the Itza migrated south to found a colony on Lake Peten in 11.12.0.0.0.

After 10.8.1.0.0 the Maya culture may be traced in two directions: southward into the highlands of Guatemala and northward onto the plains of north Mayapan. To the south there are certain writings of the Quibel* and the Cakohquels** which may refer to a portion of these Old Empire Mayas in their migration southward into the highlands of Guatemala about 10.3.0.0.0. These peoples today speak dialects of Maya. At Quen Santo, some 135 miles south of Seibal, there are stelae which indicate occupation later than existed in the Old Empire cities. In the adjacent parts of highlands south of the Old Empire region is a great body of ceramic material showing Old Empire designs.*** But little or no architectural works worthy of note are found in this area, and it is northward into the Yucatan Peninsula that we are to follow Maya architecture to its continued progress, or brilliant recovery as the case may be.

A stone lintel discovered in 1900 by E. N. Thompson at *Popol Vuh, Brasseur de Bourbourg, 1861.
** Their Annals, Brinton, 1885.
*** Morley, 1930, p. 461.
Chichen Itza, bearing the Initial Series date 10.2.9.1.9*, and one or two other inscriptions witness the continued cultural progress of this people in their new found home in north Mayapan.

Unfortunately, however, such evidences are very infrequent and their absence during the New Empire makes disconcerting any attempt at a chronological reconstruction. Very few buildings are to be recognized in this transitional period from the abandonment of the Old Empire cities about 10.2.0.0.0 until the rise of the northern cities in the League of Mayapan about 11.2.0.0.0. In consequence of this absence of buildings and the cessation of date inscriptions on stelae and temples, and in consideration of certain entries in the Books of the Chilen Balam, which state that Chichen Itza was abandoned in 10.5.0.0.0, it has been postulated by many that the exodus from the south disrupted the settled colonial cities, and that the period was one of "unrest and probably much unrecorded fighting."

The Chilen Balam seems to treat only the fortunes of the sacredotal class, however, and the abandonment of Chichen mentioned may not have included the large body of Yucatecan Maya in residence there.

Whether any contributions of note were made to architecture during this period of absence of the Itza is


**Roys, 1933, p. 136.
questionable. If building progressed, it may have been in stone or in wood. Stone buildings would likely have been buried in the program of rapid expansion that followed, for it was a prevailing custom among the Maya, in the progress of civic growth, to cover over older buildings and use their bulk as foundations for the new. The Temple of the Warriors, El Castillo, the Caracol, and the Nunnery at Chichen Itza are only a few examples which have revealed this practice in the north; in fact, few substructures excavated have not yielded some earlier constructions within their mass.4

Many of these structures may have supplied building material for the later construction, and in which case would have been lost to research. The Initial Series Lintel found by Thompson had been reused as a stone in the altar of a later temple, and more examples have been found in the Temple of the Warriors and other buildings.

That timber construction may have been used, if not in Chichen then in several other cities to the west and south during this transitional period, seems surely to be indicated in the conventionalized ornament on the palaces of Labna, Uxmal, and others that date from the period that follows. Here stockade walls, log cribbing, and lighter diagonal lattice are represented in fine conventional manner in limestone mosaic set in concrete construction.

* This practice at Uxactun and Copan has been noted earlier.
Whatever may have been the conditions prevailing, one can scarcely fail to appreciate the part which the colonial cities must have played in sustaining the cultural development which was to culminate in the high attainments of the two periods of the New Empire:

The League of Mayapan —-11.2.0.0.0 to 11.12.0.0.0.
The 'Toltec' Period —-11.12.0.0.0 to 12.15.0.0.0.

After leaving Chichen, the Itza made their home at Chokenputum until that city was destroyed, by fire or by warring tribes, in 10.19.0.0.0 and they returned once again to the city of their name. About this time, the city of Mayapan was settled, and shortly afterward, the city of Uxmal was established by a tribe under the leadership of one Ahzuitok Tutul-Xiu. These three cities, with seat at Mayapan, joined in an alliance, The Federation of Mayapan, which was to successfully administer the affairs of most of the northern area.

Peace, prosperity, and industry followed during the next two centuries, and in over one hundred cities now known to the archaeologist, architecture, once more articulate, found expression for the institutions and the ideals of its people in their new environment.

Here were united into a coherent development the resources gathered in the ages of progress of several tribal elements — conserved in the colonial cities and freshly stimulated by contact with new environmental elements.
With new improvements in technique of construction, structural principles gained refinements and precision in familiar methods of vaulting. Planning realized probably to the limit the possibilities offered by the traditional vault unit alone. Monolithic concrete construction was reached as the goal toward which the Maya use of limestone had tended since the earliest building in the south. These advances were expressed with a new clarity and neatness in proportion, and in detail of ornamentation.

Sculptured ornament became more architectural; old subject matter was conventionalized in very satisfying contrast to the naturalism with which sculpture had covered architecture in the south. In the Old Empire the artisan had been limited to the use of stone tools; the discovery of hard copper tools* now allowed more finished stone work with less expenditure of labor. Probably largely in response to this, rich geometrical patterns and mask-forms were executed in mosaic of excellently cut limestone set as veneer on the concrete hearth.

Itza-Maya architecture was fast reaching the apex of its development, and examples of this period are to be seen probably in their purest forms at Uxmal, Labna, and a few other cities of that vicinity. In Chichen Itza, the Nunnery, the Caracol, the Chacmool, are among the few

* See account of Thompson's dredging of the sacred cenote at Chichen Itza, Willard, T.A., 1926, p. 97.
examples of the period of the Federation.

If there is for example in the latest annex to the

Mansion evidence of a tendency toward the baroque, the
decadence that would probably have followed was averted
by a new element which was to inject a fresh vitality and
a new splendor into this Middle American architecture.

Political troubles between the ruling families of
Mayapan and Chichen Itza led to the conquest of Chichen
by Hunac Ceel, ruler of Mayapan, with the aid of seven
Mexican captains and their soldiery. As a result the
Itza left that city and moved for southward to Lake Peten
where they made their home until after the Spanish Conquest
of northern Mayapan.**

Chichen Itza was granted to the Nahua (?) leaders in
recognition of their services, and Mayapan ruled the country
for the next two centuries and a half. With this city is
closely connected the semi-legendary figure Mukulkan,***
and just as the soul of Itzamna had lived in the hieroglyphic
writing, calendar, and architecture until the fall of the
League of Mayapan, so now the plumed serpent symbolism of
Mukulkan was to be the dominant motif of every architect-
ural composition of this 'Toltec' Period.

The cenote at Chichen, the opening to the cavernous

*See Roys, 1933, p. 177.

**These Itza were visited by Father Buenalide in 1619.

*** Literal translation into Nahua: Quetzal coatl.
shode of the Rain-God, received untold numbers of sacrifices to that deity, and Chichen became the object of pilgrimages from many distant provinces. *Landa wrote: 

"Into this well they were and still are accustomed to throw men alive as sacrifice to the gods in time of drought; they held that they did not die, even though they were not seen again. They also threw in many other offerings of precious stones and things they valued greatly; so if there were gold in this country, this well would have received most of it, so devout were the Indians in this."

The column, used probably to the full measure of its possibilities, in connection with the Maya vault allowed expansion of the plan which had not been possible with the vault alone, and in facade treatment it characterized the fine expression of the horizontal theme so well realized in this era.

Sculpture in bas relief ornamented column, lintel and door jambs in a rich overlay that at once is architectural and ornamental. And then the symbolism of Kukulkan became crystallized into probably the most noteworthy contribution of the 'Toltec' Period to Maya architecture, the conventional feathered serpent column.

The rule of the Cocoyoces had become overbearing and in 15.5.6.0.0 the people at Chichen Itza banded with the Kiin of Uxmal, and under the leadership of the governor of that

*Cates, 1937, p. 90.*
city sacked Mayapan and slaughtered all except one of the ruling house, to the termination of the 'Toltec' Period.

This was apparently followed by a short Maya revival and the recording of dates—a practice which had apparently terminated with a date on the Caracol and one on the Bell Court at about the beginning of the 'Toltec' Period. The final result, however, was the dissolution of Itza Maya culture in the petty struggles between the Xinaa, Chels, and Cocomes which lasted until the final deathblow—the Spanish Conquest in 1519 C.E.

* See Thompson, J. S., 1937, p. 190.
Now let us consider in detail such fragments of Maya architecture as archaeology has recovered from the ruins of Mayapan, and place these as nearly as possible in their proper relations upon the historical map of Maya cultural progress. The reconstruction of a connected and detailed view of Mayan architectural progress is made impossible at present by the large gaps that exist between the several examples which are available -- these gaps often occurring at periods of most rapid transition. On the other hand, many structures are available which indicate the broader, more general tendencies and limits of Mayan endeavors. Occasionally a very rich wealth of material allows a detailed reconstruction at some indicative point in their progress.

Enough for the present if we sketch in boldly those portions clearly discernible, indicate the general probabilities of transitional periods, and do not attempt a detailed reconstruction on too slender basis where material available does not warrant it.

As has already been seen the structures related to religious institutions and those demanded by the activities of the ruling caste, itself closely related to the priesthood, formed the more permanent hub of every Maya
city. This center enjoyed the more imposing development, while the dwellings of the general populace lying outside this central area, the homes of a communalistic farmer folk, were much less permanent and less imposing.

While this is true, and it is the former which claims more extended attention in this paper, still it was the abilities and industries of the populace which made possible the development and growth of these religious civic hubs. The dwellings in which these people lived and from which they went to their work and to which they returned — the abode of family life, which is the assurance and contentment and strength of such a civilization — must be of considerable interest in any architectural study.

The homes of the ancient Maya are to be seen today only as innumerable low mounds scattered in orderly groups about the ruins of a one time thriving center — and as such claim little more than casual attention. On the frescos of temple and palace walls, however, these houses are depicted as they once stood, sometimes amid scenes of battle, sometimes in the background of the activities of daily life. Studied closely these pictures reveal a very * illustration: Temple of the Warriors, Chichen Itza, see Morris, Charlot and Morris, 1931, Vol. II, plates 139 and 159. Also from the inner chamber of the Temple of the Jaguars, Chichen Itza.

* Illustration: Temple of the Warriors, Chichen Itza, see Morris, Charlot and Morris, 1931, Vol. II, plates 139 and 159. Also from the inner chamber of the Temple of the Jaguars, Chichen Itza.
close relation to the stone, wood, and thatch huts which are built by the Maya today. Also in Landa's *Yucatan*, and in reports made by Spanish officials to Philip II, descriptions of the Maya houses, their materials, and methods of construction at that time, show them to be essentially like the present day dwellings.

Some of the house mounds of Uaxactun, Guatemala were excavated in 1932 by Robert Wauchope and reveal the following information.* These mounds are usually rectangular, varying in length from twenty to seventy feet, in width from fifteen to thirty feet, and standing four to ten feet high. They are constructed of artificial fill retained by walls built of dressed limestone; the fill was tamped down to a level hard surface, and either covered with a layer of marl and plastered smooth or left plain. Often connected with these mounds are low, flat terraces on one or two sides, which were probably covered with thatched porch roofs as indicated by post holes at the outer corners. Steps ascended to the mound floor either on the terraced or unterraced side. On this mound was erected the Maya home. Because of the deterioration of the mound surface during centuries of rain and the destructive growth of tree roots, it was impossible to determine the plan or nature of construction of the superstructures where they were

built of perishable materials, which is apparently the general rule.

One mound similar to these was excavated which carried evidence of more permanent construction. A low, thick stone and plaster wall (about thirty by thirty inches) outlined the plan which was a simple arrangement of two rooms with exterior doorways. Presumably walls and roof of poles and thatch were constructed above this plan.

House mounds excavated at other Mayapan sites have revealed a general consistency throughout, but with a wide range of individual variations as to the details of their size and shape and the method of construction of the retaining walls.* Never do these reveal enough evidence of their one time superstructures to allow of their reconstruction.

With this in mind, and in view of the suggested close comparison between the present day and sixteenth century dwellings as revealed in the writings of the Spanish and in temple frescoes, Wauchope has made a study of the houses of the Maya populace today, noting in particular such details of construction and deterioration as will enable a reconstruction of ancient houses upon the meager evidence available in the house mounds.**

** Wauchope, Robert, 1933.
This study showed that while some of the houses of the present day Maya often bear the effects of Spanish influence, certain characteristics can be traced back to his Maya heritage.

Types of Construction which can be traced to pre-Spanish times are to be seen employed in the building of Maya houses today. These are the picturesque homes of a simple, sturdy farmer folk and are mighty interesting. They are constructed of undressed poles, pliable vine and henequen fibre for lashing, and grass or palm for thatch. To this are frequently added lime plaster and stone or dry rubble walls. In their structure they are remarkable examples of frame construction, simple and efficient, details often showing study and refinement. The Maya is an artist and he understands light timber framing. The building of these dwellings consists essentially of two operations: the construction of the roof with supporting framing, and the erection of the walls.

Plans are very simple, seldom involving as many as four or five rooms, and may generally be classified as one of two types, determined by the roof construction: a house may be rectangular or apsidial. And there is a third class which would attempt to retain the rectangular form while employing the principal of roof framing characteristic of the rounded-end structures; it is essentially of the latter type.
The roof framing is erected first. On four or more sturdy posts, usually rising about seven feet above the ground and having their upper ends either forked or notched, two cross beams are laid and lashed. On these cross beams, just outside the line of the posts, are lashed two longitudinal pole plates.

Two or more A-frames carrying the ridgepole rest their forked butt-ends on the cross beams or are lashed to the insides of the pole plates. Between ridge and pole plate, roof purlins are fastened on cross arms of the A-frames. A grill of rafters and roofrods is laid at a pitch from 42° to 60° on ridgepole, purlin, and pole-plate; a second, or false, ridge rod is often laid in the V formed by their intersection over the true ridge, and the whole is lashed into place. Diagonal struts are set from cross beams to ridge pole and when needed for additional rigidity, diagonal 'roofbows' are lashed to the under sides of the rafters.

This is the essential framing of the rectangular house while the apsidal frame requires another operation. In the rectangular type the gabled ends usually are furnished with a grill of rods to receive thatch, or again these ends are hipped. This hip is probably more desirable as it would be tighter against rain. In this case the pole plates extend past the end A-frames far enough to give the hip slope, and a second pair of poles supports
their extremities. On this is placed the inverted fan-shaped grill which carries the thatch.

The apsidial type attains this hipped effect in a very different manner and may represent a later development of the former hip. Here the roof purlins and poleplates are extended in a semicircle at either end of the house and the rafters carried by them form the elements of half cones.

These end purlins are formed of bundles of five to ten supple withes twisted into a tight spiral and bound together. The ends of these cables are bound to the ends of the poleplates and purlins and the lower one is supported by light posts.

The roof is now thatched with palm leaves or well dried grass straw, the grasses being preferable where they are available as they usually will last from two to three times as long as palm. Wauchope has given interesting description of the methods used to apply thatching; these varying some in detail. Probably the most recommendable method bundles the straw tightly into good handfuls and lashes these to the roofrods with henequen fiber. These are allowed to lap over as many as three of four tiers — the whole when finished being very watertight and standing a fair chance of lasting twenty to twenty-five years.

This roof erected on its strong pole framing constitutes the Maya's essential protection against the long
wet rain season and against the driving heat of the tropical sun during the dry season. It is easily constructed, efficient, and durable.

Plan requirements vary the size and proportion of the area covered from a long and narrow rectangle to a square, and the roof changes accordingly, but generally the construction outlined above is followed with only such minor details as are expedient in individual cases. While some few structures present alternative solutions and varying degrees of perfection are shown in a variety of examples, radical variations are apparently only of sporadic occurrence and usually represent individual inefficiency. I do not mean to include here any houses that show influence of Spanish types. The houses of the Maya shown in photographs, and of the ancients as shown in the temple and palace frescoes show invariably the form of roof described.

There seems to be no apparent reason why structural principals or materials or abilities with which the Maya is equipped would not allow more elaborate development of roof form to cover any plan expansion he cannot conveniently house under the rectangular and apsidal roof forms he employs. And as Mr. Wauchope points out that the Maya houses reveal a decadence since the conquest, we may assume the present knowledge of the Maya is heritage which his ancients developed and enjoyed centuries ago.
Most likely his plan development satisfied all the needs and desires of the social and economic life of these ancient farmers and these roof forms proved dependable and economic of labor and material.

The walls are last in order of construction of the Maya house, and although their general outline is determined by the type of roof form erected, they are otherwise an independent consideration. Primarily they are not intended to function structurally in supporting the roof. They usually stand just outside the line of the mainposts and well under the overhanging eaves and in most cases they are lashed to the pole plates. Although their presence does contribute to rigidity, such is usually incidental to the support they receive from the principal framework. In the case of the masonry walls it is sometimes obvious that it was intended they should support the roof; in which case the main posts were removed when the wall was finished — but as a rule these posts, which are quite adequate in themselves, are left standing, as can be seen from many pictures of Maya houses.

The walls are essentially screens for privacy, comfort, and protection, and as such they show a wide range of solutions. In a quite representable range of climatic conditions and personal preferences and convictions the available materials have been developed into several distinguishable types of wall construction.
In some parts of Mayapan the bright glaring sunlight and the suffocating damp heat have demanded light blindlike screens of wattle with open space just under the eaves for ventilation; while in other localities the occurrence of annoying winds and blowing rains has led to the plastering of this at least partially with adobe. Again the desire for greater security or for more permanent construction demanded the use of heavier poles in stockade like construction. This was often used as a core upon which lime plaster or rubble masonry was fixed. Rectangular areas of unplastered vertical poles appear as blinded 'windows.'

In Guatemala, particularly in the highland region where the nights are cool, walls frequently are built of adobe brick or of mass adobe held by a framework of horizontal bamboo rods. Where rock is easily obtained on the surface of the ground as it is in northern Yucatan where the soil is scarce and out-cropings of limestone are abundant, walls may be built of dry rubble or of rubble masonry depending on the means of the builder.

Combinations of wood, stone, and plaster constructions occur throughout Mayapan -- and often these are not without rather pleasing results. The use of low masonry walls with vertical poles or wattle above to the eaves probably offers the greatest structural and aesthetic possibilities.
Mr. Wauchope has described in detail these methods of wall building employed by the Maya today, and has mapped the percentage of occurrence of each in the towns he has visited. While these several alternative methods admit of some regional and linguistic grouping and must reveal a prevalence of choice, it is evident that the rule of individual choice today does not show any such conformity to singleness of type as it does in roof construction. In his walls, the Maya has found the full freedom of personal preference and an interesting variety obtains.

We are not without certain information as to the practices customary among the ancients. In the records of the Spanish it is evident that many of the materials used today were used in a very similar manner during the sixteenth century. From this the conclusion seems to follow that they were known and practiced in Mayapan before the conquest. It seems most probable that not only did the ancients know these methods, but where they used them during the height of their culture would have developed them to a higher degree of perfection than is found among their descendents today.

The houses shown on the frescos in temples are of little help in this connection; in the only ones I have found available those fragments of the painted plaster which show portions of dwellings show the roofs, but not
enough of wall in most cases to reveal the method of its construction. The only indication (on the edge of one block) appears to be a plain white area. In her restoration of these wall areas Mrs. Morris has indicated the entire walls of the several dwellings as of this same surface, which would apparently indicate whitewashed adobe, or plastered surfaces.

Most of the house mounds excavated at Uaxactun apparently carried superstructures of perishable material, but the details of their construction were not apparent. Wauchope finds in mound IV, sufficient reason to believe the walls were low masonry walls carrying vertical poles or wattle.

That the Maya knew and used stockade walls by the early part of the New Empire is very likely to be seen in the decorative patterns in stone on the facades of many of the palaces at Sayil, J ewie, Labna, Kabah, and several other sites in northwestern Mayapan, where wooden prototypes of these palaces are indicated. Decorations on each side of the great portal at Labna would seem to indicate a lattice-work prototype. In the western facade of the East Range of the Nunnery Quadrangle at Uxmal and on the Governor's Palace at the same site this lattice-


work is used over a plain masonry wall. That these methods of wall construction (if indeed such are indicated) should have been used also in smaller dwellings seems most probable.

At intervals in the facade of the second story of the palace at Labna are niches designed to represent small thatch-roofed structures. Also on each side of the Portal of the same structure are two similar ornaments. Again these are seen on the south range of the Nunnery Quadrangle at Uxmal. These may have represented dwellings.* The stones which form their walls are not incised to represent any type of wooden construction; and as the sculptor went to trouble to indicate thatch on the roof it would seem that the conclusion should be that stone or plaster was intended to be shown for the walls. One might well hesitate to find too much information of house wall construction from these ornaments, for as the examples noted all occur at points in facade which called for large plain areas to contrast with the rich black and white lattice patterns in the background, liberties may have been taken to obtain the desired decorative effect. But the discussion is drawing too far afield; the determination of Maya dwelling construction must rest until further excavation shall allow new approaches.

* As shall be seen later, shrines may have been indicated.
These homes, however comfortable and picturesque they may have been and well suited to the simple tastes of daily life, could not have presented their builders with difficulties they could not solve with a few sticks and stones.

In the central hub of the city, however, one finds the architect, engineer, and artisan at once involved in activities which must have engaged the full measure of their abilities. Here centered the most aspiring life of the cultured -- the focus of communal activity controlled by the priesthood. It was to this center that the Maya looked for the benefits of science, arts, and religion, and to which he devoted his untiring industry. Governmental activities and religious solemnity demanded monumentality, dignity, and repose, characteristics for which the architect continually sought fuller expression in limestone construction. Here was the stage setting for the ceremonial dances and pompous religious ritual of the American Indian in one of his most intense developments. Gold, jade, and colorful featherwork of ceremonial regalia were reflected in bas relief and fresco ornamentation of his buildings.

These structures were united into systems of planning as intricate and complex as must have been the religious and social activities for which they formed the setting. It is beyond the reach of our minds today, out of touch
as we are with most of the institutions of these people, to understand and fully appreciate the complexities presented by the relations of these, structure to structure and group to group.

While much of the significance which the Maya saw in his problems and the particular manner in which he solved them must escape us in their study, still there are general principles of design and construction which engaged his attentions, and the manner of their solution reveals something of his interests and ability.

The primary unit of every Maya civic plan was the court group, about which were arranged the several temples and palaces and other related structures. Under the favorable tropical climate these open areas were convenient and more pleasant for the assemblage of large groups than were the interiors of buildings. Consequently a very elaborate development of the court arrangement, involving problems of the relation of group to group, constituted the growth of these communal hubs. While the buildings developed very readily in exterior facade treatment and more slowly in structure and plan.

Indeed this development reached its height in the southern cities in the Peten region and was likely never equaled during the New Empire. The Maya love of the land -- of his particular locality -- ever found its expression in his architecture. His query seemed never to be how he
might adopt the site to make it best fit the demands of a traditional style. Rather he sought to realize the full possibilities suggested by the locality. It is in this light that one can best understand the development of the Mayan cities, which found a variety of expression as wide as the variety of natural environments in which these cities were built.

In the Peten region the vertical development of these plans received its greatest stimulus; in this uneven country, cities were usually built on the higher ground. Hills had been formed by the erosion of the horizontal strata of limestone which shaped them in natural levels and terraces. Unhampered by need of streets, the Maya built his groups of structures atop these knobby hills, joining court to court by broad stairways, and upon his terraces raising platform mounds and pyramids on which he erected his buildings.

Such a city as this was Uaxactun, where the highest hill rises over a hundred feet above the valleys below and other hills for a mile about rise to varying heights, each carrying its own group of structures. The high central acropolis is topped by two knobs, one about thirty feet lower than the other. These are joined by a broad causeway on each side of which the valleys drop sharply away. It is interesting to note that these valleys have served as stone quarries close to the building activity —
a consideration preeminent in the minds of these people without machinery or draught animals and obliged to transport their stone by manual labor. Moreover, these pits were so placed as to accentuate the bluff appearance of the higher knob and bring the steep-sided causeway into sharp contrast with the green valleys below. The squared, flat terraces above, with their horizontal buildings on steep pyramids, rise high above the surrounding country. This must have been a beautiful site in its day."

Tikal* was a city of epic monumentality. In the middle of a broad, open, forest studded plain, between and on each side of two ravines, rise three parallel mesas. Upon these was built the city which stands even in its ruin proud and defiant, a bold giant of the plains. The tops of these mesas were stepped into various terrace levels and paved; above these the buildings rose to great heights of over a hundred feet. The faces of the acropoleis were hewn and squared and the ravines spanned by level causeways; and from the central mesa a wide ramp descended to the plain below.

While this city was rising in its imposing grandeur, to the south, Copen *** in its rich valley and with quieter

* Illustration: Ricketson, 1937, Fig. 197-199; Smith, A.I., 1937, pl. 24.

** Illustration: Totten, 1926, p. 35.

*** Illustration: Morley, 1920, pl. 6; Totten, 1926, p. 41.
aspiration, was building in a slightly different manner. Dr. Gordon has described the ruin: "The area comprised within the limits of the old city consists of a level plain seven or eight miles long and two miles wide at the greatest. This plain is covered with the remains of stone houses, doubtless the habitations of the wealthy. The streets, courts and courtyards were paved with stone or with white cement made from lime and powered rock, and the drainage was accomplished by means of covered canals and underground sewers built of stone and cement. On the slopes of the mountains, too, are found numerous ruins. On the right bank of the Copan river in the midst of the city stands the principal group of structures — the temples, palaces and buildings of public character. These form what has been called for want of a better name the main structure."

This main structure is probably one of the Maya's greatest contributions to the vertical development of their cities. The eastern portion of this acropolis has been washed away by a change in the course of the Copan River and the section** so formed shows that this mass of the civic plan was not of one period of building but is composed of at least six layers of accretive growth. In these, plaza levels, drains, and portions of buildings.

** See Morley, 1920, p.7.
tell the early history of the city. One building program after another displaced earlier works which in the architect's estimation were best replaced, until the group shaped itself as it stands from the lost era of construction—a massive limestone structure approximately eight hundred feet square and upon whose various finely proportioned terraces and pyramids stand the principal buildings of the city. If the intimate relation of one court unit to another has escaped the modern perception in most cities, the general relations of the one to the other and their buildings are so expressed here that one cannot fail to appreciate the architect's use of the vertical.

Copan appears to have been the center of a very populous area; "the outlying sections of the city overflow into smaller adjacent valleys ... Even the hillsides and mountain-tops were terraced, and not only the main valley but also the adjoining valleys were intensely occupied."* The artistic character of Copan can be recognized for many miles about.

Sometime after the early founding of Uaxactun and Copan and probably before Tikal had advanced very far on the road of its civic program, there was recognizable interest taken in the orientation of the several buildings within a court group and the common allignment of these groups. In a plan composed of otherwise unfamiliar elements,

this at once becomes outstanding.

This is probably a natural development of the court plan which will eventually assume a rectangular form when more and more rectangular buildings come into close proximity. Or its origin may bear a religious significance in view of the fact that all civic plans are oriented within several degrees of a true north-south direction.

Whatever the origin, its recognition and use in these cities is of considerable importance in the order of their civic plans.

It makes its appearance very early on the several archaeological strata in the east group at Uaxactun.* Excavation of this group revealed six or more superimposed layers of construction which mark the successive growth of that portion of the city. In the earlier levels platforms not only show orientations different from the latest level, but these platforms are not rectangular. Their plans were probably so distorted to conform more easily with some adjacent structures of different orientation. This device is universally familiar to planning and seen frequently, not only in the latest construction on the main acropolis at Uaxactun where it forms a very pleasant relation to the natural contours of the hill, but in most other Maya cities as well. The subsequent levels of building covered these lower platforms and replaced

them with those structures associated with the latest activity at this site — a well composed group, oriented true north.

The structures atop the two knobs of the main acropolis, except for those few units aligned with the contours of the hill, observe a common orientation. Along the axis of this alignment and joining main plazas of both groups runs the causeway which bridges the valley between them. The appearance is one of alert purposefulness involving every member of this complex and is an interesting example of axial development.

Other clusters of structures upon lower hills show a variety of orientations and the unity of this civic plan fails to extend beyond the central acropolis except for the somewhat suggested relation of the imposing Eastern Group about three quarters of a mile away.

The main structure at Copan shows an interesting example of what may happen when at least two such groups, each aligned within itself, have, in their natural expansion, grown together at the important focal point of civil interest. The solution is much more valuable than the principle it set out to restore, for it is keenly revealing of the architect's demands and abilities. The fine court of the hieroglyphic stairway forms such a pleasant transition from the great plaza to the acropolis that one standing in the court could probably not discern the dis-
crepency between the two. While for one standing on the acropolis the angle of the court wall is consumed in the splayed form of the court, and the elements of the problem have been converted into a pleasant composition.

It is evident that these Maya had come definitely to desire uniformity of alignment — rigid orientation. This and a full appreciation of the expressive value of vertical development characterized several cities that followed in the Peten region and northeast Mayapan.

Polol* gives an interesting glimpse of what the framework of substructures of such a city in its infancy may look like — not at all an unpleasant composition. The main elements seem to be a very large open court balanced by the weight of a high pyramided substructure which probably held a temple. Lesser buildings take their places about the sides and ends of the court which is very open to circulation from all sides. Alters, stelae and smaller temples are erected in the court which probably formed the stage for ceremony and celebration. Not the least interesting aspect is the pleasant manner in which the various rectangles approach and relate to each other. The Indian is inherently capable in the composition of geometrical designs.

Coba* probably represents the full fruition of the germ of horizontal and vertical planning which found such rich soil for development in the Peten region. Here is the highest complexity of court group arrangement. Unified into one coherent whole by rigid orientation, it rises stage by stage from the shore of the lake to the height of the centralmost (and probably most sacred) temple. From the top of this ruined structure one looks out from Coba, hemmed in by the dense forest, over the blue waters of Lake Coba to the west, and Lake Macanxoc to the southeast, and beyond to clusters of other ruins among the jungle.

Excavation of these smaller sites has revealed that they also show the same attention to civic planning as Coba, but each with its own problems and their unique solution. The orientations of them all are very nearly the same as that of Coba, approximately 10° east of true north.

Raised paved roads or sacbeob connect these groups with one another and with other centers even so distant as Yaxuna,* fifty miles to the west (twenty miles southwest of Chichen Itza). This sacbe, about thirty feet broad, runs almost true with only a few deflections near the Coba end, and near the Yaxuna end ascends and descends.

* Illustration: Thompson, Pollock, and Charlot, 1932, pl. 13.
** Illustration: Villa R., Alfonso, 1937, pl. 9.
by steps (?) the sides of a low truncated pyramid. The ends of the road terminate in steps. These 
seibaob were built of loose rubble retained between two parallel walls of large stone. They were finished with a smooth convex 
surface of seibaob, the breccia found in this area.

None of the seibaob apparently have a connection
with Chichen Itza and would suggest that the development
at Coba preceded the settlement of and terminated prior
to the rise of Chichen to the position it appears to have held during the New Empire. This suggestion is substanti-
ated by the date series at Coba and the tentative date of about the middle of cycle nine placed upon the Coba-
Yaxuna-Seibo by Villa.

Among the Tumbe foothills of central Chiapas, 
Palenque® was conceiving a different beauty in the grace-
ful horizontal sweeps of the picturesque valley in which she was set. Totten admired the ruins: "The artificial 
acropolis and gigantic terraces at several of the classic cities are monumental and imposing, but the slopes of 
the valley at Palenque are so moulded and formed into terraces about the important buildings end for some dist-
ance beyond, as to be the work of truly great landscape artists."

Little of the plan of this city remains, but the

* Illustration: Totten, 1926, p. 75.
**Illustration: Totten, 1926, p. 74.
several isolated structures and the group of the Temples of the Cross and the Temple of the Sun show that here was developing a far different conception of the value of orientation and horizontal plan arrangement than was realized in the cities just described. Free abandon to the natural contours of the valley was allowing new conceptions of horizontal expression, and Palenque and the other cities of this region made contributions to architectural detail which were to be carried northward and developed during the New Empire.

The next view of civic planning available is of the New Empire cities after their extended developments. While the court group still appears as the unit of civic plan, the principles of its composition among other related courts as conceived in the Peten-Coba development seem to have suffered radical revision. In most instances these New Empire plans are disappointing when seen on the map. Chichen Itza* appears as a scramble of courts, plazas, and structures. And while many structures show themselves to be related in orientation to one of a few schemes, their fusion and confusion along the fringe of these areas does not, at least in the present state of excavation, show the nicety of attention paid to such problems here as in the south. Chichen was of course, to recall its history, the product of several tribal settle-

ments and may be expected to show such confusion over the more singly peopled cities of the Old Empire. But architecture spanned the tribal relation in other elements of its development in the north as well as the south and here was a problem presented to it in which it failed to find enough interest to solve except within the individual court assemblage. This same attitude is to be seen in varying degrees in most other New Empire cities.

But while the mind is confused by the intricacies of the plans of these northern cities, the eye is pleased again and again by the expressive development of the individual structure -- in the horizontal theme.

In the plan of Tulum* one is probably to read the story of its historic and artistic position. It is a walled city, closely compact for defense -- a pioneer in the path of radically conflicting elements from south and west, and a seacoast town in touch with the coastwise trade by canoe. The alignment of its structures with the shoreline follows the rigid orientation of the earlier southern development, but except for the central temple-palace group, the court arrangement is not followed. Many of the buildings are arranged along a street marked at each end by a passage through the great wall.

The possibilities of horizontal expression are

* Illustration: Lothrop, 1924, pl. 23.
probably to be seen in their most inspired, if archaic beginning at Tulum. Ever conscious of the vast horizon of the Caribbean Sea and the long stretch of the limestone shore line, this city followed traditional principles and made its own radical revisions and contributions to architecture. Terraces change level as easily and gradually as the slope of the limestone coast as it rises to its brow along the sea. Where height was needed for prominence it was gained by horizontal staging; the steep, massive pyramid was not used on the east coast. New principles of construction replaced old vault forms which would not lend themselves to an honest expression of the exterior proportions demanded for temple and palace.

On the Yucatan plains during the League of Mayapan Uxmal, Labna, Chichen Itza, with the rich wealth of artistic ability and classical heritage were to realize in refinement of proportion and detail this horizontal theme.

We have seen the range of the environmental settings which inspired this variety of civic expression in which the unalterable unit of Maya civic planning -- the court group -- was fixed. Comparison and study is now focused on the individual structures which composed these groups—the buildings themselves.

These buildings are usually recognized as belonging to one of two general types, designated as Temples and
Palaces. The former is simpler of plan and associated with the higher pyramids prevalent in any area, while the latter is more complex of plan and almost always found on the lower platform mounds.

The temple type reveals itself readily, by its ornament and position in the court group, as a building directly connected with religious ceremonies, and thereby claims its name. While examples chosen at random from different historic periods or geographic locations are likely to present a wide variety of individual characteristics, there is a broad consistency exhibited throughout its long evolution. This can be best understood when one considers the singleness of principle, the limestone vault, which the Maya employed throughout the history of this evolution.

There is hardly any typical building of this type, but it may be represented for the moment by what is probably the most familiar example, El Castillo at Chichen Itza.

In proud dignity atop its lofty stepped pyramid this square limestone building looks down on the ruins of Chichen -- and it is said to be a very awe inspiring sight for the traveler as he comes upon it out of the jungle. One may ascend this immense limestone pyramid by its steep steps, flanked on each side by balustrades carved to represent the intertwined bodies of gigantic
rattle snakes. Arriving breathless at the top, he steps out onto a narrow platform ledge surrounding the temple building, eighty feet in the air. This building is not large, forty nine feet by forty three feet, and four times as high as a man.

In front of him a wide doorway opens into the semi-lighted corridor and the darker inner sanctuary. The sapote lintel over this doorway is supported on two immense columns designed to represent the sacred feathered serpent. Their two large heads rest on the floor and their plumed rattles rise high overhead against the ornamented upper facade of the building. Inside this temple, square stone columns support sapote beams and a vaulted ceiling. Columns, beams, jaabs, and lintel are carved in low relief, and traces of deep coloring still show on the stonework. The subjects of this carving, priests and warriors in full regalia, could hold one's interest for some while.

Turning about in the doorway, one looks out over the jungles stretching far away into the distance. Here and there a hill-like swell marks the site of another city buried in the tropical growth, and the mind is recalled to the ruins below in Chichen. From this dizzy height one looks down the precipitous sides of the pyramid and across at the temple of the warriors, a poem in limestone, and the great flanking colonnaded court -- and catches a fleeting glimpse of past grandeur. The richness of white lime-
stone against the green of the Yucatan jungles, of
bronzed bodies and brilliant feathered ceremonial robes
ascending temple steps to stand against the blue sky in
the light of the rising sun. He has come to understand
better the beauty of the Mayan temple with its fine carv-
ing and feathered serpent columns, the richness of frescoes
in the cool depths of shadowed chambers. And he descends
to wonder about the other ruins with a new respect for
these Maya architects.

Closely related to the temple in form and religious
usage, but distinguishable from it as a subtype, are the
many small buildings usually termed shrines. Although
as a class these shrines occur quite generally over Maya-
pan, in different localities they show unique characters.
Universally they are simple, one room structures of a
square or rectangular plan which varies in size and pro-
portion. They occur in many different positions but al-
ways bear some obvious relation to a temple or temple
group, which would suggest a ritualistic function. Most
of them house an altar, sanctuary, or stele, although
some have been found in which these elements have not
been revealed by excavation.

Two distinct groups are to be recognized in the
eXamples known: those with vaulted ceilings and those
which probably had walls and roof of wooden construct-
ion.
Provenant from Cobá southward along the east coast and often found in the region of Copan and Peten, the shrines of the first group are miniature, vaulted buildings. About Tulum many are of flat ceiling construction. Those range from those too small for one person to get into up to those with ceilings seven or eight feet high. Of the structures just larger than this, the shrine being practically identical structurally and stylistically with the temple, it is difficult to say whether they are small temples or large shrines. These diminutive temples are usually found singly or in groups of two or three closely attendant upon some temple or group of temples.

Sometimes they are so closely related as to function in the design of the temple itself; this is true of El Castillo, Tulum, where the small units in front of it are set upon a low shelf close against the base of the pyramid. Patterned after the design of the larger temples, these are interesting studies in miniature of the structural and decorative themes of their prototypes. Holding a different but close stylistic relation to El Castillo, they form notes of pleasant and interesting variety in the assemblage.

In these shrines are to be found altars and sanctuaries where copal incense was burned and other rituals performed while the ceremonies attendant upon the temple were

* Thompson, Pollock, and Chariot, 1935, p. 112.
** Lothrop, 1934, p. 26, and 107.
ensued before it.

In other instances these shrines were raised to a distinguished position atop small block platforms of their own. Many fine examples of this are to be seen about Tulum, where most of these small sentinels look out across the sea, landmarks today in white limestone against the green jungle.

All the shrines of the vaulted group, although not presenting any very serious structural difficulties because of their smallness, nevertheless, are very faithful to structural principles and thereby gain genuine expression of the ornamental themes they exhibit in miniature variations.

Shrines of the second group are members of a larger family which are often known as foundations because they appear as low stone walls that in all likelihood formed foundations for walls of more perishable material. These foundations occur over most of Mayapan, but apparently were more abundant at Coba where they were used to house stelae, a practice not found elsewhere. This has led to their being termed stelae shrines in this area. All carved stelae at Coba were so housed. Pollock describes in detail those which were excavated at Coba and Macanxoc.* and these should serve to illustrate the group as a whole.

* Pollock, 1935, p. 35.
These occur at ground level, on low platform mounds, or on pyramids, and are not so often associated with any particular temple as were the vaulted shrines already discussed. Their nature recalls the interesting consideration of the type of wall construction on the house mound excavated at Uaxactun; almost identically here, a low, well-formed masonry wall marks the shape of the plan and the floor, usually, where evidence of surface can be discerned, is smooth plaster. The plans of these little stone walls show an interesting variety of ideas. The form they took was primarily dependent upon the design of the stelae which they housed, secondarily but not inconsiderably upon the creative originality of the designer. Stelae with two carved faces were set in a shrine with two doorways, one opening to each of the carved faces; one sided stelae are usually against a back wall and side walls reach forward to an open, or partially open, front. But initiative did not find a limit with functional usage. In one shrine a bench is run around these walls, again a short bench sets on each side the stela against a solitary back wall; again and again from one shrine to another a slight play that marks each plan as unique.

From the absence of debris it would seem apparent that the shrines were not covered with a masonry vault. * Those low masonry walls with their square benches set

* Pollock, 1932, p. 113.
sharp against the richly carved steles in the open courts or atop low platforms a few feet above the paving, would have made a neat appearance. I have misgivings, however, that these shrines were originated in the first place to protect from weathering the carving which was done in the poor limestone of this region. Most likely—in which case, walls of vertical poles or wattle with a thatch roof are indicated.

These may be added to those of the temple group already described three more classes of structures which have a religious significance; these are steles, alters, and platform sounds.

These steles and alters, whose significance as dated examples of artistic style and technique has already been discussed, contributed their rich carving to sculptural decoration of most Old Empire court groups. Their position on the pavement immediately before or upon the platform with temples usually accented points axially related to the temple, and their vertical erectness provided a familiar and pleasant contrast to the slope of steps and pyramids. Where an increasing number became associated with any single temple, they presented a problem of arrangement to avoid clustered grouping; the north end of the Great Plaza at Copan seems to be unfortunately crowded. More often than otherwise they decidedly contribute to the general nice appearance.
Platform mounds will probably reveal to further excavation a more colorful significance than is at present attributable to them. Many of these low broad platforms would seem to have had a ritualistic function. In the court at Tulum directly in front of the Castillo and across the court from it stands such a structure. It seems to have possibly been a stage upon which ceremonies were enacted before a large group of people.

In the center of the Great Plaza at Copan stands a truncated pyramid which would seem to have had no structure on top of it. And in the western court on the acropolis two platforms present a more complex relation, one directly across the court from the high temple, the other on an axis at right angles to and crossing the line between the temple and first mound. This second platform faces a reviewing stand. More examples could be named of such ritual mounds. Their position is most frequently one which gives significant appearance to the court area.

Other mounds similar to these but not lying in such prominent positions are those containing tombs. Several of these are reported at Tulum and such was the high priest’s grave excavated at Chichen Itza by Edward Thompson. Some of these mounds reveal a few traces of small stone construction on them, but not enough rubble for evidence of vaulting, and the conclusion would seem to be that

* Lothrop, 1934, p. 61, 96, 97.
they did not have a superstructure, or that it was of perishable material similar to the house mounds at Uaxactun. This recalls the reports of Sauchope in his study of modern Maya houses; it is a common practice of the Maya to bury their dead in their house mounds.

The Maya ball court is essentially a combination of two parallel rectangular platform mounds, which in their earlier examples have the inner faces sloped to the bottom; in the later examples these faces are vertical. At the center of each side a stone ring was fixed through which the players bounced the ball off certain points of their body — a real feat. These mounds often carry reviewing stands and temples.

The designation Palace is used to refer broadly to those buildings not of the temple type. Speculation as to the probable function of these has reasoned that as the priests and ruling caste enjoyed a very distinguished position in social life they must have enjoyed more permanent and sumptuous living quarters near the temples, hence the term Palace. On the other hand, excavation of these structures very seldom yields any household furnishings, and probably never had evidence of housekeeping been clearly shown. Opinion thus oscillating is hardly better exemplified than in the summary rendered by Ledyard a Sauchope, 1933.
The function of Structure A-XVIII is uncertain. It is multichambered, and might accordingly be classed as domiciliary. That it also fulfilled religious purposes can, however, hardly be doubted because of the altar in Room 12. Evidence of habitation is afforded by the pottery and artifacts found in the rooms, by the presence of two child burials, and by the charcoal-filled holes in the floors of the rear rooms. It has been suggested that these were used for cooking and that the rooms in which they occur may have been used as kitchens. This can hardly be so, because the walls and vaults show no sign of smoking. It is possible that the building served as a residence during their period of office, for those in charge of ceremonies, and as a place of storage for the paraphernalia that priests used for such ceremonies. It is even possible that priests occupied the building with their families, as the presence of child burials might indicate. Whether or not this is true, it is certain that the long, badly lighted, narrow rooms did not offer much in the way of comfort as a permanent residence."

At this point one is reminded of the many large platform mounds found at various sites. Some of these, their surface so bare of ruins as to have never owed a superstructure, are located close to temple and court

groups but apparently do not bear any axial relation
to them which would suggest that these mounds were cere-
monial platforms. Possibly on these were erected comfort-
able living quarters for the elect, great honey palaces
of wood and thatch, ambitious developments of the dwell-
ings we have already seen. Such speculation is not without reason when the great stone and concrete structures
at Uxmal, Labna, Kalach are recalled, with their convent-
ionalization in stone of a stockade and lattice wall types.
So far, none of these have been carefully investigated for
traces of perishable superstructures. But a tentative
picture of Maya civic and religious hub with great palaces
of wood and thatch as well as temples and palaces of lime-
stone is not unreasonable. That it is not impossible
aestheticlly is suggested by the very successful use of
the deep red of sapote beams against limestone in the
temples of Yucatan, and the interesting contrast seen in
masonry and wood construction in Maya dwellings today.

This is speculation, to be sure. But it is entirely
reasonable to suppose that the Maya at one time con-
structed these large dwellings of timber -- and possibly
that he continued to do so long after he was building in
limestone. In view of the consideration that stone build-
ings normally would be more desirable than wood and thatch,
Mr. Smith's criticism of the inadequacy of the Maya stone
structures, as living quarters, brings to mind certain
Factors of interest.

Windows were markedly absent from Maya buildings—only small slits a few inches wide and a foot or more high pierce the walls. These appear to have been intended for ventilation. That the Maya was able to pierce his vaults with windows is clearly evident in several cases, for example, the large window-like openings which pierce the upper vault between the parallel rooms in the Palace at Palenque. But such large openings probably never opened a room to the outside, and for good reason. Under the heat and glare of the tropical sun, which entered every opening and reflected off of courts and buildings, the cool, dim interiors of these heavy limestone vaults were pleasant and restful. It was probably to reduce this reflected light that the Maya habitually stained his floors deep colors.

The width of rooms in Maya structures was decidedly limited by the methods of construction he employed, which methods failed to give him the advantage of the full strength of his concrete. Lighter vaulting in the progress of his engineering allowed wider rooms at later times, and by the Toltec period the use of the column allowed much greater areas.

Whatever wood construction the Maya may have built, the finest architectural expressions remaining today are in those structures in limestone and lime concrete where
the artistic industry of these farmers was raised to aspiring heights by Itzamna and Kukulkan. Here are the strength and boldness of aesthetic expression which bear witness of a sturdy cultured Indian race. Copan, Labna, Uxmal, Chichen Itza, each claims its praise.

Copan may be remembered for the grace and beauty of her civic planning. At Labna, the Grand Portal bears, through centuries, the strength and majesty of proportion of the Maya vault form, and the rugged pleasantness of limestone mosaic work. These probably show their most refined expression in the Nunnery at Uxmal. The broad, open quadrilateral plan, and the dignity and refined proportion of facade ornamentation are those of the concrete vaulting in its most perfect form known in Maya Pan. The crisp pattern of excellently cut stone mosaic is refreshing. In the Caracol and the Temple of the Warriors at Chichen Itza, a new element makes bold beauty of horizontal terracing. Ornament, if not so sensitive to refinements as that of Uxmal, finds new vigor in the freedom of its execution. Fresco ornament developed its own methods of perspective as direct and satisfying as the bas-relief that was used on column and lintel. The Temple of the Chac Moul gave to excavators one of the finest pair of serpent columns yet found.

Any list must be incomplete, for what new wealth lies buried so near to the present claims? How fragmentary is the picture even at one of these cities; and yet how much there is revealed in those few sites excavated!
This building was proposed to house the artistic achievements of the ancient peoples of America. The architecture of the Maya was chosen as the basis of the design in consideration of his artistic position among the several culture areas. It is not intended that any specific examples of this architecture should be imitated, but rather attempt was made to practice those broader principles of Maya design which could be recognized and used to produce a structure suited to its usage and in harmony with the objects it houses. The Maya vault forms lent themselves readily throughout to construction and lighting, and in exterior facade treatment to the attempt made to recall the use of the horizontal and the fine proportions that are so pleasant in New Empire Maya buildings.

The interior is meant to be as intimate as possible to each group in order to place the objects in their most familiar settings.
By changing proportions and materials slightly in the different courts, a harmony between the setting of the objects and the structural unity of the entire building could be obtained, and with a pleasant relief from monotony, while in the Maya court actual historic examples would be used for columns, stele, and wall decoration.

The courts of the three main cultures are arranged about the central court where the most outstanding show pieces of each group would be exhibited. This for the Maya area, which lies in the more important position on the main axis, includes a pair of serpent columns incorporated in the entrance portal. These columns from the Temple of the Chac Mool can be seen forming the border of the elevation drawing.

To the left and right of the central court are the areas devoted to the cultures of Peru and the Valley of Mexico. Adjacent to these, and to the Maya court, and opening off the corridors are the courts of the related lesser cultures of South and North America.

The floor levels of the building rise by stages over broad stairs to their highest level at the back of the Maya court where the main axis of the museum is stopped by the group known as El Castillo, Tulum. This structure is a museum piece itself, exhibiting in a very interesting manner four different early developments of that colonial East coast settlement in its aspiration toward horizontal
expression which was later realized in detail in the
cities of the Yucatan plain. These include two shrines
at the base of the structure, one of them of Old Empire
vaulting, the other of the flat rubble ceiling construc-
tion. The second level is the large palace, also of flat
rubble ceiling, this time with columns which accent the
horizontal lines. The crowning temple is vaulted in the
form to which practice returned after the flat timber
framed ceilings were found to be structurally unreliable.
This temple has the slightly splayed walls and the convex
roof that give Tulum architecture its particular beauty,
and the feathered serpent columns that date it as of the
final period of Maya architecture. Here are the products
of successive building programs structurally placed so
that they reveal their chronological relation.

The downstairs area of the museum is exhibition space
to be devoted to the display of the show-pieces which
would interest the general public. Those various other
objects and fragments which have an interest only to the
student are catalogued and arranged in proper cases on
the second floor above the lower galleries.

The several galleries opening off their courts are
lighted by reflected light off the paving, as was Maya
practice — and quite adequate in the tropical sunlight.
Other indirect lighting would of course be provided where
and when needed.
The offices and lecture rooms and the libraries can be entered from the small entrance court at the front of the building, and such arrangement allows the administrative affairs and lecture program of the museum to be carried on without conflict with either hours or circulation of the display area.
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