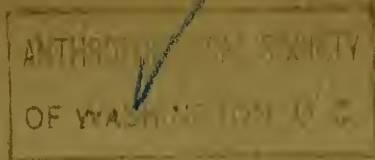


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CAVE HUNTING

IN

YUCATAN

A Lecture delivered before the Society of Arts of the Massachusetts
Institute of Technology, on December 10, 1896

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FIG. 1. ACTUN CEH, BENADO. (*Cave of the Deer.*)

In the Sierra de Yucatan, about two and a half leagues westward from Opichen. The immense underground room, reached after a long clamber in the darkness, is lit from above through a skylight in the middle of its ceiling. The roots of alamo trees on the right hang downward from the brink of this luminous chasm to the cave floor, from which remarkable stalagmitic forms, tinted by contact of light and air, rise on all sides. Several of the prominent surfaces have been inscribed by the ancient cave visitors with dots and circles suggesting the human eyes, nose, and mouth, and the outlines of animals resembling deer.

CAVE HUNTING IN YUCATAN.

INTRODUCTION.

CAVE HUNTING EXPLAINED.

Two years ago the Corwith expedition of the University of Pennsylvania (under the kind auspices of Dr. S. Weir Mitchell, and named after its generous donor, Mr. John W. Corwith, of Chicago) set out at rather short notice to open, it seemed, a new field of archæological research in Yucatan. We were going to hunt in caves for evidence of man's antiquity. We asked how long man had inhabited Yucatan, and under what circumstances he had first arrived there. Not that the question had not been asked before by Stephens, Waldeck, Charnay, and other explorers, who had speculated upon the age of the ruins of Central America; but we thought that we were possessed of a way of getting at the question that was quicker, surer, and more conclusive than theirs. We were going to test the antiquity of the man that built the wonderful ruins, and gauge his original state of culture, not by the ruins themselves, but by the traces of his presence left by him in caves; and we were the more confident of success from the fact that the caves, abundant as they were in the region, had never before been

searched. We were the first upon the field—the first to attempt to translate their hidden contents.

But why search caves? Why go under ground? Why leave the daylight and all the beauty and wonder of the ruins to delve in damp, dark holes, where at most we proposed to find a few broken pieces of pottery, a few fragments of bone or chips of flint upon which the visitor at a museum might scarcely bestow a glance.

On the answer to this question hangs the whole justification of our attempt, and that answer is, that science has shown that if you want to get to the bottom, to the beginning of the human story, you must hunt in a cave. Science has shown that most if not all primitive peoples, when confronted by caves which were accessible, light and dry, at some time or other entered them. When they did it has appeared that they built fires on their floors and scattered the bones of cooked animals near by, until caked deposits of rubbish were trodden down upon the foothold, and until these, when interbedded with bands of loam or leaves or stalagmite, proving intervals of time when the cave was vacant, presented us with a series of epoch-denoting layers resting upon the cave floor, one upon another, the oldest on the bottom and the latest on the top. Science has thus shown that before artificial houses were built, man entered these natural houses prepared for him by an ancient geological process before his coming, and outlasting his day, and that there, where the rock walls and the limit of light and darkness compelled all cave visitors to inhabit the same area, the whole problem of sequence, of who came first and who came last, layer upon layer was buried at one spot. For these reasons a great number of caves were excavated in England, Belgium, France, and Germany, and a large amount of evidence collected, which over and over again repeated the same story.

Where does the word prehistoric gain its significance? What signifies this classification in ages and epochs of man's culture in the last fifty years? What justifies us in saying that during a series of millenniums before Herodotus and Pliny, before the dawn of history, man had bronze before he had iron; that older than bronze was polished stone; and that older than polished stone was chipped stone; that with bronze and polished stone man had domestic animals, but with chipped stone, none; that during the bronze and polished stone time animals were recent, while during the older chipped stone epoch they were of species now extinct? Let it be said again, in answer to

these questions, that nothing has so well established us in this new knowledge, now not over fifty years old, as the investigation of layers in caves.

No doubt that these cave layers are often missing. No doubt that they are often disturbed, and that there is often much confusion in the record; but as far as Europe is concerned, that man was present and left his footprints in available caves, there can be no doubt. From the man of history to the man with bronze, from the man with bronze to the man with stone, from the recent man to the fossil man, as far as Europe is concerned, all have left their traces in caverns and rock shelters. Now, if science has shown this in Europe, what shall it show for America? When we come to look shall we find that the same rule of superposed epoch-denoting culture layers holds good here? Can we dig down into the subterranean floors and find fossil man here as we found him there? These are questions which I began to ask four years ago, and am still asking, and all that I have yet to present is a narrative of how, in one way or another, I have found the evidence in American caves scanty and shallow, and of how up to date I have failed to find fossil man.

What if we continue to fail to find him? What if we find that he does not exist anywhere in the caves of America? What if we go down the Ohio and Kanawha and Delaware and Susquehanna, as I have done for the last three years, preferring the great waterways and passes where savages would have crossed the Appalachian barrier from east to west, or west to east, and find that this earlier fossil savage, who should have been a contemporary of the extinct animals, is always missing? What if as against all the culture layers of Europe we here find only one—always find the Indian and nothing but the Indian, represented by a characteristic rubbish band composed of familiar arrowheads, potsherds, and bone needles on the floors of all these caves; and what if beneath this in the ancient red or yellow cave earth we dig again and again to the mother rock, to find sometimes the bones of bats or rabbits, or the remains of snails, sometimes the vertebrae of the great sloth, the teeth of the tapir, or the jaws of the mylodon or peccary, but never a trace of humanity?

Such is the kind of evidence thus far gleaned by us from the American caves; but before trying to draw a conclusion from it, it remains to be asked, have we gone far enough? Have we searched enough caves to warrant us banishing fossil man from the eastern

region or setting a geological limit to human existence in the New World? Have we investigated regions where we might expect to find man older than elsewhere? And our expedition to Yucatan was a reply to this by pushing the research into a district where it seemed that man should have been old if he was old anywhere on the continent.

YUCATAN PROMISES TO SOLVE THE AMERICAN PROBLEM.

Judged by the test of written language, the old inhabitants of Yucatan might reasonably be placed at the head of all the people found by Columbus in the New World. The Peruvians had *quipus*, tally-knots on thongs or strings, by which something previously learned by heart was suggested to the expert reader. The Mexicans had picture writings more or less symbolic. But the Mayas whom the Spaniards found in Yucatan used hieroglyphics where a symbol comes to stand for the object, and the mind prepares itself to invent an alphabet. The Peruvians were master masons in the massiveness of long and high walls built of immense hewn blocks. The Mexicans were lofty mound builders, and the people of the Ohio valley constructors of such great and elaborate earthworks as you see at Marietta, or at that poetically beautiful fair ground at Newark; but the carved palaces of the Mayas, overloaded with mysterious symbolism whose ruins still astonish the traveler in the forest of Yucatan, exceeded everything. We had a notion of a sort of civilization older than that of Mexico buried away in the wilderness, of something that even the Indians had themselves forgotten when the Spaniards came, of something more ancient, more elaborate, more marvelous in Yucatan than anywhere else from Behring Straits to Patagonia; and when we learned from Professor Heilprin that in the very midst of all these awe-inspiring ruins described by Stephens and Waldeck, by Charnay and Maler, there were abundant dry and spacious caverns which none of these travelers had explored, it seemed as if we had the question of man's antiquity in America presented to us in a nutshell. There where man had reached the highest point of semi-civilization or barbarism in the new hemisphere, it seemed as if all the doubts as to his antiquity could once and for all be set at rest. If he was old anywhere he was old there. If the American problem could be settled anywhere it could be settled in Yucatan.

THE AMERICAN PROBLEM.

But what is the American problem, and why settle it? Has it not been settled before? Do we not know how old the Indians are? Have we not the Calaveras skull and pestles and mortars excavated from the bottom of gold mines? Have we not the Trenton "turtle backs" chipped by human hands and gathered from a bank of gravel on the Delaware River, which, by the last of the geological time estimates, should be about 32,000 years old? Dr. Koch's spear-heads, with mastodon remains, chipped blades from the beds of fossil lakes, and a dozen other evidences of man's great antiquity—do they not prove that long before the Indian as we know him, we may look back into the geological past and behold humanity here as in Europe, a contemporary of the mammoth and the mastodon, the saber-toothed tiger, and the fossil horse? Let it be answered that in spite of all thus far presented on the subject, we are still in doubt if not darkness. Let him who supposes that all these things described and recapitulated in the introductions of recent text-books and histories are proved and settled, try to investigate them for himself. When he does he finds that what he had regarded as well-fixed facts fade away like stories of ghosts and haunted houses at near approach. He learns that while in Europe it is an easy matter for you or me to step upon a railway train and go to any one of a score of sites where human remains can be found at short notice with the bones of extinct animals, here, on the other hand, we may assert that no explorer will venture to lead us to-morrow or next week by a journey long or short (which some of us would willingly take) to any point whatsoever east of the Mississippi, where he can guarantee us a sight of fossil man or of one of his implements in place. As far as America is concerned, *homo fossilis* is desperately hard to find.

This, then, is the problem of man's antiquity in America; we do not know how long man was here. The red man was found here, but we have not yet accounted for him. Let alone the question of the Indian's predecessor if he had one, we do not know where the Indian came from. We cannot say whether his development of language, of architecture, and varying customs, whether his dissemination of maize, his apparent domestication of the dog and the llama, whether all this is an affair, geologically speaking, of modern times, or of a longer epoch; of the time represented by the forest loam under our feet that

grows western wheat without manure, of the present existing plants and animals, and of the outlines of the country as we now know them, or of a time denoted by a race of animals that is extinct and measured, according to Spencer's late work at Niagara Falls, by a lapse of 32,000 years. This is the question at the bottom of American archæology. This is the question that we went to Yucatan to settle, and to settle by means of hunting in caves.

Marvelous as were the ruins, interesting as were the Indians themselves, the descendants of the builders of the ruins, we turned away from them to dig under ground, for there we ventured to believe that the truth might be demonstrated for the first time. Somewhere, very deep in the cave earth under the crusts of refuse left by the builders of Uxmal and Labna, we must find the trace of fossil man if he had existed in the region. Well might the sites of the known ruins excavated to their full depth fail to reveal his presence, but here, if his footsteps had ever trod the peninsula, he could not escape us.

Such, then, was the promised glimpse of a new knowledge hidden in a dark chamber of which we had the key, that thrilled us with excitement as we set sail for Yucatan. And this is the only consideration, perhaps, that warrants me in coming here to describe our journey as a thing at all memorable, or different from the ordinary experience of travelers who visit the mysterious and little-known land of which I shall speak.

THE PEOPLE OF YUCATAN.

So hurried had been our packing up and departure that we had hardly had time to imagine the kind of people and country that we were to see. We knew that there was a semi-tropical forest, and we imagined orchids and birds of gay plumage. We knew of the marvelous ruins hidden in thickets, where, as in the fairy tale of the "Sleeping Beauty," you cut passages with axes to see deserted palaces that lie concealed only a few yards away. We had been warned against snakes; and to wade through the jungle, as we imagined it, we had taken leather leggins made nearly waist high, and I was prepared to invent better ones and cooler, of fine wire netting, that I thought seriously of having patented. We had heard stories of treachery, and that it would be unsafe to wander away alone with Indians. Hence pistols

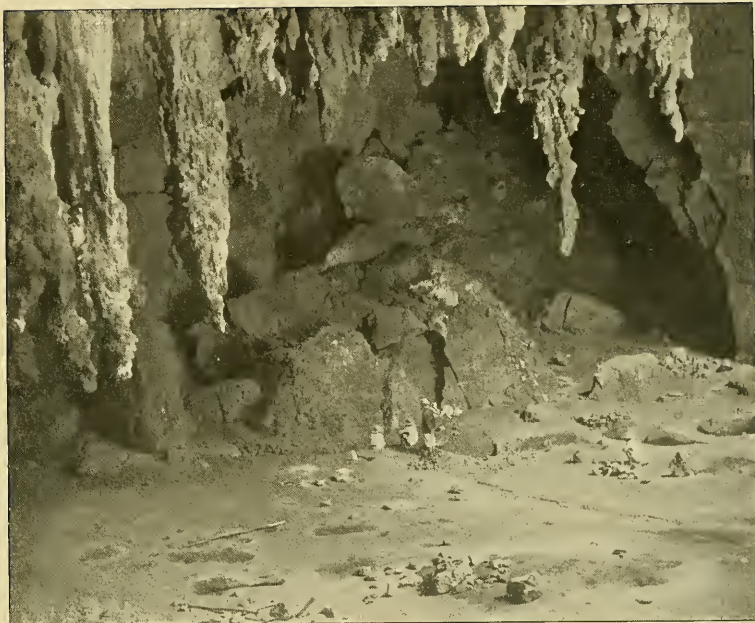


FIG. 2. CAVE OF LOLTUN. (*Rock of Flowers.*)

Probably the most beautiful cavern in Yucatan. Situated in a forest solitude near the hacienda of Tabi. Its several spacious rotundas connected by dark passages are lit from above by skylights fringed with forest. Below colored stalactites a graceful underground vegetation charms the eye, and there, water, ever precious in the parched land, drips from shadowy ceilings into ancient dishes of stone. In the charcoal-blackened floors the sought-for proof of human presence was found, which, it is believed, has thrown for the first time the light of reasonable surety upon the antiquity and culture of the ancient peoples of Yucatan; setting limits to future speculation, and preparing the way for a just interpretation of the grotesque ruins, the strange mural decorations, and the hieroglyphs, still unread, that Stephens and Waldeck described to astonished hearers half a century ago. The view is taken in the second or largest rotunda. The Indians are sitting on the edge of trench No. 1, beyond which the dark passage on the right leads to the entrance.

were a necessity. In the rock pools beset with bacteria we were warned not to bathe, much less dared we drink the water, full of fever germs as it was, without previously boiling it. But the first sight of Yucatan suggested another danger against which we had taken precautions in the form of a supply of quinine—namely, fever.

The water rippled by a gentle wind looked green where we lay at anchor one morning, after a seven days' sail from New York, and the shore three miles away seemed yellow and very low. At one spot there were outlines of buildings, and some palm trees raised their graceful fronds through a stratum of vapor. Mr. Armour, whose yacht lay near, and who kindly helped us through the custom house, came aboard and warned us against the feverish place, Progreso by name, advising us to lose no time in leaving it for Merida, forty miles inland. His expedition had been confronted with danger and difficulty. Uxmal was certain malaria; Tuloom was held by hostile Indians who had just murdered the Spanish governor; members of his party had been driven to desperation by wood lice, and their botanist was ill. The prospect looked discouraging; but once ashore, the responsibility of our long list of bags and boxes, the novel and reassuring look of the place and people, drove doubts to the dogs.

And it was these Maya people who first and last attracted us, while, indeed, a great deal depended on them. If they were to be dirty, surly, cheating, avaricious, or treacherous, if they were to refuse us permission to dig into the remains of their ancestors, we were at their mercy. But in all respects we were most agreeably disappointed with them; and in the first place, I think I may say that they gave the impression of being the cleanest people I ever saw, my own countrymen not excepted.

The white muslin that dazzled the eye in the sun seemed always white; faces, often smooth-shaven in the Spanish fashion, were clean, and hair well brushed and cut. Where the water came from for the ablutions was a mystery, in a land where it was so scarce. But in this respect our cook, Pastor Leal, put us to shame. On sweltering days, after long walks through the woods when we looked and felt like repulsive vagabonds, he in his white muslin jacket was apt to present the appearance of a very elaborate bartender at some very luxurious hostelry, with a rose in his buttonhole.

No stabbing in the back in Yucatan. No muffled figures lurking around corners with *machetes* as in other parts of Mexico and Cuba.

An overseer told me, strange to relate, that when the Indians fought, they fought with their fists. So we put away our pistols as useless things, and when after weeks of experience with open doors, and with our rooms scattered with valuables that were never found missing but once, we were ready to admit the truth of Professor Heilprin's expression, that the only thief he had met in Yucatan had come from Philadelphia.

But how was this to be explained? Who were these people? Why were they so much more attractive and gentle than any one else? Why different from the Cubans or Mexicans? Were they not Spanish with a little Indian blood in their veins? The answer to these questions seemed to lie in the important fact that they were rather Indians with a little Spanish blood in their veins. A very few of the important families were pure Castilians. All the rest were mixed, and the darker they were, it seemed the kindlier, the cleaner, and the more good-natured.

What an important fact to realize, that the Maya people, who built the great ruins of Central America, have not been stamped out of existence like our Eastern Indians. There they are still to be studied, and I will add, liked by any one who goes to Yucatan. Comprising four-fifths of the present population, they still speak one of the most interesting of the languages of ancient America, and the only one that ever was written. Like many a conquered race, they seem to be absorbing their conquerers.

Their kindness smoothed our way everywhere. The Bishop of Yucatan, to whom we had a letter of introduction from Dr. Brinton, presented us to the large landed proprietor, Señor Escalante, and he to Señor Duarte and to the governor. It so happened that a line of great plantations (*haciendas*) lay along the hills in our way, and we were to travel to and from them. Instead of camping in the forest, we were to sleep under their shelter, and when we found what the forest was on the one hand, and the *haciendas* on the other, we thanked our stars.

Not soon shall I forget our first impression of a *hacienda* at Chal-cetok. A tram car awaited us at a wild little spot called San Bernardo, and piling our baggage upon it, a single mule whisked us at a run through the evening air. Across broad fields of the hemp cactus called Hennequin (*Agave sisalensis*) we rattled. Then came a smoke stack in the distance, then a village of thatched huts built of mud and



FIG. 3. MEZTIZA GIRL.

wattle, where at each door you saw half-naked children, figures in white dress, against the characteristic outline of the swinging hammock, and at last the court surrounded by graceful buildings and round arches supported on pillars. By these picturesque galleries under the palm trees, white-robed figures came and went. From a chapel near by a bell rang, and we heard the sing-song of children's voices repeating a prayer. Then the overseer received us, and going in, our party of five, Mr. Corwith and myself, with our secretary, assistant, and two cooks, took possession of three large bare rooms, one of which was a kitchen. While the hammocks were being hung on hammock pegs I walked out on the terrace and looked about. Somehow the scene reminded me of Egypt. The walls, the palm trees, the blue scarves in the twilight were oriental, but the forest seemed strange. I saw it beyond upon the hills, and it stretched away into the horizon, surrounding us with mystery, and shutting off the spot from the nineteenth century and the world. Behind the hemp mill there were gardens, beautiful orange groves hanging heavy with fruit, and birds that sang all day. There were large water tanks and channels of masonry where artificial streams flowed as you see them in gardens in the Levant. After the coming of night and by the rise of the moon, we desired but little to go to bed and lose sight of a reality stranger than fiction. Rather might we have sat up all night imagining ourselves in a land of Lotus or some garden of the Arabian Nights.

Tabi was another *hacienda*, and Yokat another even more beautiful, each of which we left with regret, and each of which vied with the other in hospitality. Sometimes villages lay near us, whither, if not too tired, we might walk of an evening to some public entertainment or a *mestiza* dance. In Merida we had been to an opera and seen the "Huguenots," where all the ladies, seated in boxes, considered it their duty to put on their best French dresses and sit through the performance more or less bored to death. What a contrast was the nocturnal scene that confronted us in the open air at Opichen!

Round about us among flickering torches stood little thatched booths where they cooked cocoa in open fires, or made you strange salads and highly seasoned dishes, and where you smoked highly flavored cigars to the echoes of music half Spanish, half Maya, played on fiddles and flageolets. The strains came from a large shed open on the sides and full of dancers. But I must say the dance was a disappointment; that it lacked the action, the spice that I expected. When

one of the Meztiza girls so celebrated for attractiveness danced, she danced alone, and to our minds spoiled her appearance by putting on a man's hat. Several times with stiff solemnity her partner circled about her, and then the two separated, she going one way and he the other. I had heard no loud talking in Yucatan, and here, where demonstrative conversation seemed out of fashion, met no exception to the rule. No audience at a temperance lecture could have taken matters more seriously than did these people during the solemn intermissions. But at these times outside the shed the hospitality which we had met with everywhere was clearly shown. We appeared to be guests of the village, and could pay for nothing. Indians that we had never heard of before forced expensive cigars upon us again and again. It was no use to cry "Hold, enough." I went away with my pockets full of costly "puros" done up in lead foil.

In our many wanderings into the woods with the Maya Indians, in our long diggings with them in subterranean depths where we were not rarely at their mercy, we found them faithful, gentle, and kind. Incapable of handling a shovel correctly, they would pile the blades full of earth with their hands, strike absurd blows, and work with the wrong end of the pickaxe. Yet these were laughing matters. They were children always; you could no more scold them than you could beat a delightful puppy who nibbles the corner of a favorite book.

But a dreadful accident that overtook our party at a cave brought us nearer to them, perhaps, than anything else, and I doubt if any civilized people could have behaved with more dignity and refinement when confronted by sudden and tragic death. We were in a deep, well-like rotunda, where for hours we had been at work. Seated on a mossy rock I was writing my notes while the boughs of several trees that grew from the floor through the skylight rustled overhead. In their high tops two barefooted Indians who had followed us were climbing from bough to bough like monkeys, as with their knives they cut green branches for their cattle at home. Throwing these upon the neighboring ledge at the chasm's brink, one of the men stepped across, seized a pile of the twigs and began to tie them into a bundle. He had pulled them together, and kneeling with his head in the leaves was straining with outstretched arms to bring the mass within reach of a string, when, pushing too hard and too far, the brink betrayed him. I heard a great rattle, saw the fluttering boughs, and then the figure in mid-air, dashed in an instant head foremost upon the cruel rocks at

my feet. In a few seconds he had ceased breathing, and his comrades, raising him gently, felt his last heart-beats. Till all was over they looked solemnly on. Then one went away to appear in an hour with a band of friends, who, cutting boughs with their knives and tying them into a litter with a blanket stretched across it, laid upon it the body which we had meanwhile lifted from the cavern with a rope. Last of all one of them descended the chasm, and carving a cross upon the tree, scattered earth upon the fatal stains. This done we marched away in solemn procession to reach home at nightfall, when piteous wailings echoed through the village of Yokat, and we learned that the night which followed had witnessed a wake, a *baloria* differing a little from the weird ceremony so familiar in Ireland.

I believe it would be so easy to become fascinated with the ruins of Yucatan and an investigation of its past glories, as to look with too great unfriendliness upon the influence brought to bear by Europeans upon the Indians, and for that reason I cannot agree with Stephens, who continually refers to the present Mayas as a lost, degraded, and ruined race. Our observations, I admit, were superficial, and we made no careful analysis of the people. But when all is summed up, I imagine that, living as they now live, whether rooted by a sort of vassalage upon the plantations, or revolted and run wild in forests, they are better off in the scale of human development than when, at the head of aboriginal American culture, they were yet ignorant of the more useful metals and domestic animals, and stained with the cruelty of horrible human sacrifices. I would rather believe that they have a future, and are working it out by one of the most potent of all means, namely, blood alliance with the conquering race.

THE FOREST OF YUCATAN.

So much for the people; but what of the conditions of travel in Yucatan? The roads, they were abominable. You jolted over boulders, rock seams, and ledges, at a run in carts with enormously heavy, tired wheels, squirming in swinging boxes on mattresses of vegetable pollen, and tossed like dice in a dice-box. The food? That we carried with us and cooked ourselves. Black beans; rarely meat when a bull was killed; cocoa, red wine from France, and ham from the United States; rice and potatoes, sometimes delicious fruits that we had never tasted before, and oranges. What would we have done without them

to quench our thirst after long tramps, when we rolled bags full of them upon the floors of caves where there was no water? But most of the danger and much of the difficulty of exploration in Yucatan are embodied in one fact, and that fact is the existence of the forest. I had expected to see a luxuriant Amazonian tangle, to stumble over the roots of enormous trees festooned with orchids, to feel the damp touch of succulent leaves where serpents lurked and insects swarmed, to wonder at the color of butterflies and parrots. Instead, I saw a stunted, leafless thicket thickly tangled with thorns, not more striking in appearance than some dry swamp overgrown with alder and blackberry bushes in the United States in December. There were no large trees, no patches of grass, no colors; there was no noise of insects and no superabundance of birds. Under foot lay withered leaves, dry, loose stones, and ledges of yellow rock.

In this wilderness the traveler loses his way. Fever attacks him. The explorer, devoured with wood-lice, fails of heart. And where are you going to dig, among the stones, dead leaves and briers? In certain places where the thin, red soil has collected lie *haciendas* with fields of hemp, sugar cane, or maize. But elsewhere from Chiapas to Belize, from the Gulf on the north to the Cordil-dil-lieras on the southwest, this tangled, thirsty thicket covers everything. Revolted Indians hiding away in it, and using it as a bulwark against their enemies, hold their own in its depths. I do not believe the rumors of temples and cities still flourishing in it unknown to white men, but I am sure that Maler has found many structures buried in its recesses that escaped Stephens, Waldeck, and Charnay, and that no one ever heard of before, though those known to us, like Uxmal, Labna, and Chichenitza, are wonderful enough.

Not yet, owing to the difficulty of digging in the stones and briers, or of cutting down the thicket, and building scaffolds so as to even see or photograph them, have they been adequately excavated or studied. And there they stand, rapidly vanishing, it must be said, because of their imperfect construction. And because their walls rest on no true arches, because the joints are not bound nor the stones squared, and because the facing is not linked to the heart, they crumble to pieces more rapidly than the ancient buildings of Egypt and Assyria, Rome and Greece.

Some are easy to reach. You might sail from New York and see Uxmal in ten days, but I am half glad that stories of fever and snakes,



FIG. 4. VIEW FROM THE DWARF'S HOUSE AT UXMAL.

heat and thirst, have frightened away the horde of tourists who, rushing in, would rob the region of its unconscious charm. So let the ruins remain in solitude. Let them disappear in silence surrounded by all the mystery of the forest.

At Uxmal these marvelous structures are set on high mounds and platforms that look like natural hills as you catch glimpses of them from the distant sierra. The so-called House of the Dwarf stands upon the highest mound of all, and you climb to it on a stone face by narrow and steep steps, where a fall would be no less sure death than a slip on the sides of the great Pyramid at Gizeh. The wind blew fiercely when we stood there for the first time, and fortunately for us, heavy clouds drifted across the sky, darkening the strange walls below us, that rose out of the thicket. The wilderness stretched away to the hills. As we had seen it often before from the sierra, it had assumed again that day its tint of deceitful blue. It seemed as if there were cool places where rivers flowed, and where the cloud shadows fell upon it, pleasant lawns and high trees. But these mirage-like allurements were the false wiles of the ever-present forest, here as parched, shadeless, and thirsty as ever.

In the tangle of thorns below, all sign of communication between building and building, all traces of smaller dwellings, of aqueducts or roads, seemed to be lost. But who had yet had the strength or courage to search for these things in this most feverish of places, where at one time even the cattle died; where I was told that Indians did not survive two generations? Hard enough was it to penetrate the curtain of briars and mantle of rubbish about the sides and walls of the great buildings, as Charnay and LePlongeon had done, so as even to photograph or study them. The House of Turtles, the Casa-del-Gubernador, the Nunnery; what significance had these names invented by the Spaniard, as we walked through a false arch into an immense courtyard, and saw walls on every side covered with a symbolism in stone that antedated the coming of the European? Monstrous masks, projections like the trunks of elephants, grotesque tongues, great eyes, rows of teeth, rising suns, phallic signs, and above all the great rattlesnake with plumed human head-dress confronted us with a meaning that was lost. It came upon the mind in a sense of something malevolent; something symbolic of horrible and bloody themes of sacrifice; of torture and awful ceremony in the native manuscripts. It seemed to rise from the forest and haunt the memory of our journey in

the wilds. Were we in the nineteenth century? Were we looking at things that had existed, or were we wandering in a land of dreams? In these strange impressions, never known before, we felt the fascination of ancient America so potent to encompass the searcher in the *tierra caliente* and lead him astray. So often had it betrayed him with strange fancies, that counting up the names of well-known explorers who have become disturbed or distressed in this study, which I pray you to excuse me from doing here, the French have invented a phrase of sinister meaning when they say: *Toutes les Americanistes devant fous*. All the students of ancient America go mad.

CAVES.

But what of the caves which had occupied our thoughts continuously from the first? Did we succeed in exploring them, or the chief group of them that lay scattered among and between the ruined cities? Were they what we expected, and did they contain the evidence we sought? In answer to which questions let me say that our first look at the caves brought disappointment. Instead of being what I had expected to find them, they were unlike any caves I had ever seen before. Caves that contain the remains of men or animals in the United States or Europe generally open into the sides of cliffs or escarpments of rock. But these yawned down into the ground like wells, sloping inward like the sides of an ink-bottle. The fact was, there were no cliffs in Yucatan. No rivers had cut across beds of rock, thus laying bare caves in cross section. But erosion had proceeded directly downward till holes opened in the cave ceiling. Sometimes piles of stones had fallen into these skylights, almost reaching their overhanging edge. Often trees grew up to their brink. But you generally had to climb down on rude sapling ladders made by Indians, on trees or by ropes, and so difficult was it to get into many of these caverns, that they would have been ruled out of an explorer's consideration in other countries. Savage peoples preferring more accessible shelters would have avoided them, and so doubtful was it that many of them would contain all or any considerable part of the evidence we sought, that it seemed as though our expedition had already failed; as if, as far as cave hunting was concerned, we had come to Yucatan in vain. And for a time the prospect was discouraging in the extreme, until an overlooked consideration restored the caves to all

their importance. It was the consideration embodied in the word *agua*, water, one of the first and last words a traveler hears in Yucatan. Broadly speaking, the peninsula is waterless. A few exceptions confront us in the muddy, stagnant pools called *aguadas*, and a few stony channels on the northeast coast only active in the rainy season. But with these allowed for, there are no streams, springs, or lakes in the region. To get water you must go under ground for it. You must bore wells, or find it in caves where it drops from the roof. The ancient Mayas lived on rain water collected in the rainy seasons, and stored in cemented cisterns which now form one of the most important features of the ruins. But what did they do before the cisterns were built, before they had established themselves in the region and constructed the cities? The important answer to this question is, that the caves supply water, and that since the early immigrants could not bore wells in regions where there were no *aguadas*, they must needs have ransacked the caves for water or perished. And the evidence soon showed that from the time of their first coming they had entered the caves by ladders when necessary, and halted for a while near the refreshing pools or dripping stalactites.

So after all, the whole story of man's life in Yucatan was in our hands and lay buried in the caves. The lowest film of trodden earth, of charcoal, ashes, and pottery, marked the advent of the first comer, the uppermost that of the last, and when once we realized this, our work flourished. But the trouble of it was to get the right cave—a cave where the floor rubbish had not become mixed by sliding, where great blocks had not fallen from the ceiling to obstruct work, where we could dig to the living rock at the bottom without blasting or impossible expense; and at last we found it.

At a wild place in the hills called Oxkintok in the midst of a group of little known ruins, not half a mile from a stone mound that contained a complex series of passages described as a labyrinth, within walking distance of our headquarters at Señor Escalante's *hacienda* of Chalchetok, Mr. Corwith chanced upon a cave, which when we came to examine it promised to answer all our expectations.

Like all the other caves it was entered through an orifice or sky window. But the fallen rocks had so choked the entrance that ingress was easy. And one of the chief desiderata for the exploration of all caves was fulfilled when we found that even then in the midst of the dry season it dripped water, and that ancient stone dishes hollowed

from blocks of limestone lay about the floor or stood full of water under the stalactites. More than this, at the base of the skylight which lit the chamber at its farther end, lay a heap of stones which proved to consist largely of dressed blocks, chips, and partly worked water dishes left there by the ancient builders of the ruins, who were thus shown at the first glance to have come to the cave not only to get water, but to get stone. A few small crannies leading away from the spacious room had been walled up by the Indians as blinds for shooting doves. But it was the only room, and its smooth earthen floor presented the only place to dig. As sure as it was that the people of the surrounding ruins had visited this place to get water, so sure was it that proof of their presence in the form of layers of ashes, charcoal, and potsherds, of chips of stone or implements of bone, together with the remains of contemporary animals, lay under foot. No rocks obstructed us, and there was no chance for land sliding or disturbance. Directly in the middle of the chamber in the dim light of the roof window, we had found the place to settle the question of man's antiquity in Yucatan.

It was not light enough where we stood to blow out the candles by whose aid we had come stumbling onward for some distance through the darkness and over loose rocks. The Indians took off their sandals and set down the shovels and pickaxes, and the large round baskets supported by straps across their foreheads. We spread their contents—specimen bags, tape measures, monocular level, India-ink and pens—upon the ground, and then marked with trowels a rectangle to include the area of our trench, about 20 feet long by 4 broad across the middle of the cave floor.

No common curiosity, no desire to unearth beautiful vases, figurines of jade, or ornaments of obsidian, inspired us as the Indians began to dig. All these things lay above ground and around us in the mounds and cisterns, and in the rubbish near the ruins. We were hunting for a few broken potsherds and bones. But they were to tell us more than all the rest. They would answer the unanswered question, how long had man lived in Yucatan?—a question which here in the heart of prehistoric America we proposed to test for the first time, by searching for the earliest footprints of humanity in the earth beneath our feet.

We held the candles downward as the Indians turned up the lumps of earth with the pickaxes, and saw the ground caked thick with pot-

sherds and the bones of the deer. When we had dug a great hole 2 feet deep, we had passed a surface layer of human rubbish which we studied well, to find under it a band of comparatively undisturbed earth. When we had gone 5 feet another subdivision of the rubbish layer was plainly visible, some 15 inches thick, lying still deeper. The discolored earth was full of broken potsherds of various colors and makes, and intermixed with the bones of still existing animals, while in it and below the surface we found no trace of the Spaniard. Very certainly we were working among the leavings of the builders of the ruins, but we soon left the rubbish behind us and dug downward into the unknown. The earth was red and comparatively soft. The pit grew to the depth of 7, 10, and 12 feet. Days passed as we toiled on. At each new digging we clambered down to go over the bottom inch by inch with trowels and candles. We built props against the side so as to scrutinize them in the gloom for traces of layers. The small snail shells and bat bones continued, but the charcoal and ashes had stopped, and with them all traces of man. What would come next?

How shall I describe the intervals when I walked about the cavern as the work went on; while I looked at the colors of the tinted stalactites overhead; while the weird rustling of the banana trees that rose from the cave floor through the skylight, and beat the crusts with their boughs, filled the cave with echoes, or slanting sun gleams fell upon our heap of oranges till they glowed in the twilight like tongues of flame. The fact that we were upon the track of a new knowledge inspired us. If man were to intervene between us and the living rock, he was the predecessor by a long interval of the ruin builder; perhaps a stone chipper ignorant of the art of polishing stone, perhaps an undeveloped or ape-like savage who struggled for existence with the megatherium, the fossil bear, or the formidable saber-toothed tiger of Port Kennedy.

Smearred with clay, weary, full of misgivings of the caving in of the trench or some unexpected obstruction, we toiled on by candle-light; the more thrilled with excitement the deeper we dug, until at last all anxiety ended when the pickaxe clanged on solid rock. We were done. It was over. We had penetrated for the first time this region of discovery to its uttermost limit, and had found, in the thick red interval below the culture layers of the surface, nothing but bats, snails, and rabbits. Here, where the primitive savage must have left

his sign if he existed, there was no primitive savage, no trace of humanity. The human evidence began and ended with the layers above. They stood for the builders of the ruins—a people who, judged by the potsherds of the layer, had arrived equipped with the art of making pottery, who had not, therefore, developed their culture in Yucatan, but had brought it with them from somewhere else. They represented an invasion of the peninsula fairly in accord with the Maya annals—something about a thousand or fifteen hundred years old; modern as compared with humanity in Europe, that was all. It had been suspected, but we had presented direct evidence on the subject for the first time.

This, then, was the testimony of the cave at Oxkintok. Let it stand for all the twenty-nine caves explored; since all, one after another, expressed the same fact more or less clearly as they were more or less fit for excavation. For the reasons stated in my book, “The Hill Caves of Yucatan,”¹ we were satisfied; with this proof in our hands the work was done. Defeat would have been to fail to find caves favorable for excavation. But we had found them. We had been eminently successful; and though to make assurance doubly sure we pushed on, and continued to examine caves that always repeated and never contradicted what we had already learned, the work had lost its zest. What remained were glimpses of rare and wondrous beauty that rewarded us at these places; such a sight as we saw at Actun Xpukil (cave of mice), where rotunda after rotunda, lit from above and overgrown with banana groves, opened downward by what seemed subterranean valleys and mountains; as at Xabaka (cave of the coal-black water), where the dark pool lay in the gloom of an immense chamber reached by a chasm overhung with trees and ferns, and yawning from several sunny little recesses haunted by bees; like Xkokikan (the cave of serpents), where Indians told of intertwined masses of snakes writhing at the bottom of a gulf; or like Actun Benado, where the tinted walls of an immense rotunda, lit from above, rose about you like the complex vaultings of a gothic cathedral on whose walls Indians had carved the figures of animals.

But of all the fair sights of Yucatan, fairest of all and last to be forgotten, is beautiful Loltun. Rock of flowers indeed! where, like the

¹The Hill Caves of Yucatan; or, A Search for Evidence of Man's Antiquity in the Caverns of Central America. Philadelphia: J. B. Lippincott Co., 1896.



FIG. 5. ACTUN XPUKIL. (*Cave of Mice.*)

Actun Xpukil (*Cave of Mice*) is in the mountains, two miles west of the *hacienda* of Chalchetok, Yucatan, and four miles from the ruined city of Oxkin-tok; one of the largest and most beautiful caverns in Yucatan, containing fifty-nine stone water-dishes and many relics of the builders of the neighboring ruins. View from the first rotunda into the second rotunda, showing the effect of the skylight upon vegetation underground. Palm trees flourish in the cooler air. Alamo roots reach the cave floor from the brink of the skylight eighty to one hundred feet above.



FIG. 6. SKYLIGHT IN THE WATER CAVE OF OXKINTOK.

The banana trees are growing on a heap of fallen limestone fragments, many of which have been hollowed for water-dishes or mortars, or dressed square for wall building by the makers of the neighboring ruins. No trace of the tools was discovered.

enchanted garden that Aladdin saw, doomed to vanish at an ill-chosen word, groves rustled under ground, and by the quiet light of the sky windows fringed with forest, it seemed always afternoon. A bluish reflection made the air appear like liquid. By the great vaults where cool drops fell, we seemed to be walking under the sea at places where enormous fish, not stranger in shape than the stalagmites, might swim from labyrinths of coral. Here we were neither in the heavens above, or on the earth beneath, but by the waters under the earth; and the airs that drew cool through the underground gardens were one of the delights of Paradise upon those scorching days.

When the cavern had yielded its secret after ten days of toil, as we were about to say farewell to it for the last time, its superhuman beauty came irresistibly upon us. Then the great chasms and galleries leading into an unknown blackness had lost their terror. Then stalagmites, that rose in forms of men and beasts from the floor, seemed to wear gentle smiles. In the pleasant air the birds chirped alluringly from about the skylights, while from under the blue arches seemed to come a rustle of leaves that repeated the whisper — here is rest. A vague regret, a confusion of motives stirred us. We felt the power of an enchantment potent to beguile us, like the lotus eaters, to forget the way home.

We have been told that our expedition was a failure because we did not contrive to bring back a store of vases painted with hieroglyphs, remarkable objects of jade, blades of obsidian, or even manuscripts. Forgive us if we did not return laden with these things, if, in the first place, we did not go to Yucatan to find them. Neither did we go there to find fossil man, but the truth. To defend our work from the charge of failure is to say that we have cited for the first time the evidence of caves to set a limit to the speculations of archæologists in Yucatan; that by a newly applied test of much importance we have fixed a reasonable antiquity for the ruins and the builders of the ruins, and that by proof rather than guesswork we have shown that the culture of the Mayas was not developed in Yucatan, but brought from abroad.

As far as the geological antiquity of the human race is concerned, shall we not infer that Yucatan, that center of archæological interest, has been fairly eliminated from the field of search, and that from our labor it may be concluded, not unjustly, that if you would find fossil man you must look for him elsewhere?



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