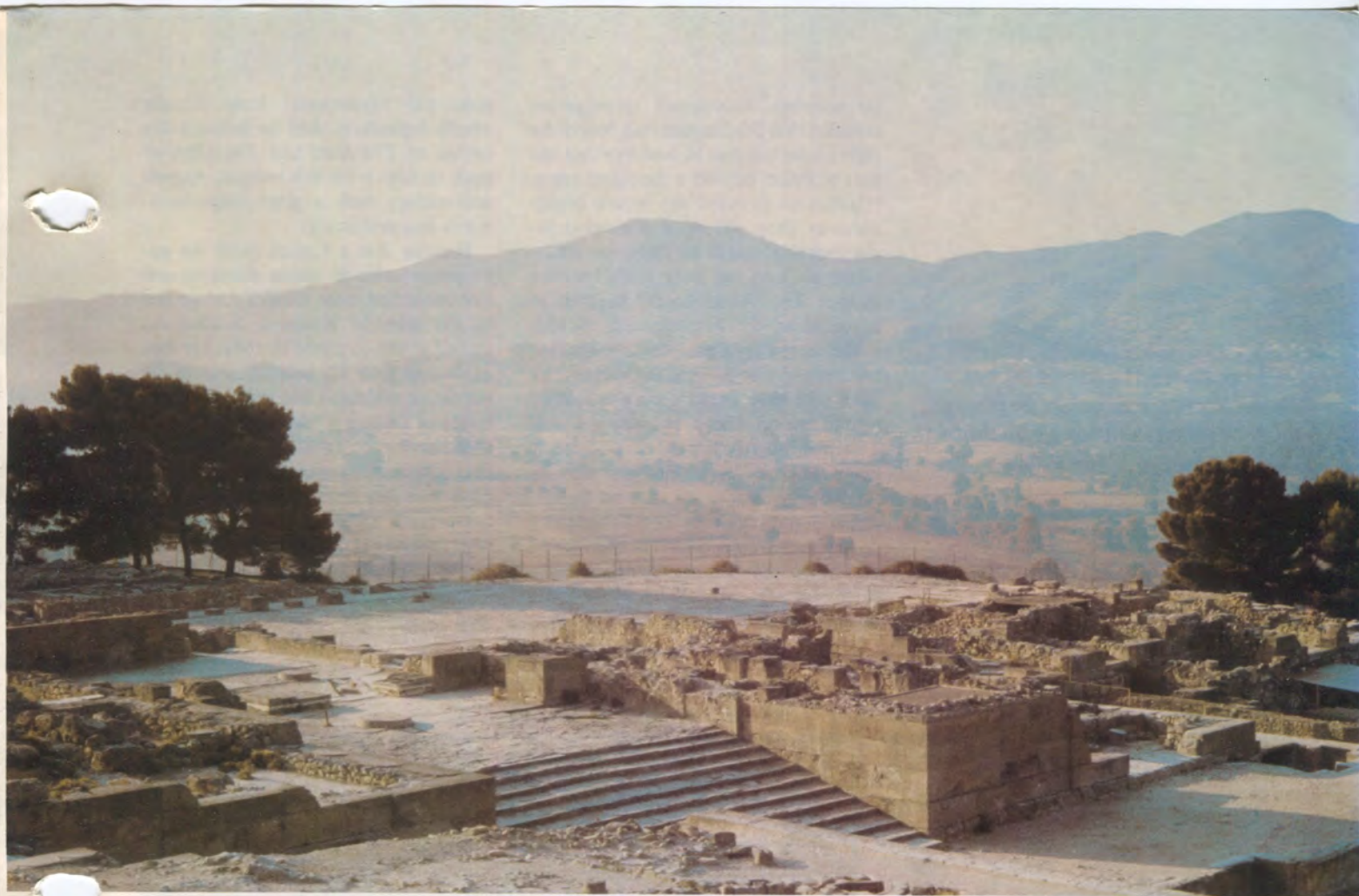




The legacy of Minos

In 1899, Sir Arthur Evans unearthed a sophisticated, yet long-forgotten civilization on Crete. The search for its secrets still goes on.





Myth and reality. Titian's Rape of Europa (opposite, top) portrays a moment of Crete's past as the West knew it before archaeologists revealed more accurate aspects of Minoan history. Stylized "horns of consecration" (opposite, bottom), both large and small, apparently denoted sacred places and objects. These stand at Knossos. Ruins of the Minoan palace at Phaistos are pictured above. The flat, paved area on the far side is the central courtyard. Originally surrounded by a colonnade, it may have been the scene of bull games.

by John Sedgwick

Mythology recounts the rise and fall of Minoan civilization. What really happened is still obscure.

The myth explains that Zeus fell in love with Europa, a Phoenician princess with a fondness for bulls. It was a desperate love, requiring desperate measures. Zeus took the shape of a bull, lured Europa onto his back, and swam away with her to Crete. There he ravished her and sired a civilization.

It was named Minoan—after Minos, the legendary Cretan king and son of Zeus—by Sir Arthur Evans, who unearthed the ruined palace at Knossos in the early years of this century. Everyone knew the traditional stories of Minos, of the Labyrinth that Daedalus made to hide the Minotaur (half-man, half-bull), and of Theseus, who killed the monster, burned the ships of Crete, and sailed

away with Ariadne, daughter of Minos. No one since the ancients had looked for historical meaning in these stories—until Evans stepped back from his excavations to survey the remains of a palace that had covered four acres, was three stories high, and had fallen nine hundred years before the Age of Pericles.

Throughout the ages, explorers had been looking for traces of Minos's realm, but they never turned up anything conclusive. So when schoolboys asked about "the land called Crete in the midst of the wine-dark sea"—specifically about "the mighty city where Minos ruled" or "the dancing floor which once in the wide spaces of Knossos, Daedalos built for Ariadne of the lovely tresses"—they were told that Homer was only being poetic. Actually, there was no such place.

One schoolboy wouldn't have it. Heinrich Schliemann refused to believe that the tales of Homer were total fabrications. He read the meticulous description of Troy in *The Iliad* and vowed that someday he would reveal that city to the world.

Schliemann amassed a fortune in the indigo trade during the Crimean War, and in 1870 he got his chance. Equipped only with an uncanny ability at languages (he knew twelve), complete faith in Homer as geographer, and an army of workmen, he sailed to Asia Minor and started to dig. His first timid assays in earth-moving were unproductive, so he drove a trench straight down into the earth until he struck a cache of gold. He labeled it "the Treasure of Priam" and electrified the world.

Schliemann had a knack for spectacu-

Evans knew the palace he was uncovering was unlike anything Schliemann had found on the mainland.

lar blunders. Subsequent investigation revealed that Schliemann had found the right place, but that he had overshot the time of Priam by over a thousand years. His famous besieged city is now recognized as Troy VII A, a somewhat inglorious title, one of 46 successive settlements built on the trade route between Europe and Asia. Later, digging at Mycenae on the Peloponnesus, Schliemann turned up a gold death mask. He telegraphed one patron, the emperor of Brazil: "I have gazed upon the face of Agamemnon." Close, but wrong again. This was indeed Agamemnon's citadel, but not his mask—it antedates him by several generations.

Yet despite his mistakes, Schliemann deserves enormous credit. In the face of all expert opinion, Schliemann vindicated Homer's authenticity. He brought to light an entire Bronze Age civiliza-

tion, the Mycenaean, long thought wholly legendary. And he brought the heroes of *The Iliad* and *The Odyssey* back to life. With Schliemann, Aegean archaeology took a giant step—backwards into prehistory.

Hearing that a Cretan (with the appropriate name of Minos Kalokairinos) had unearthed some ancient storage jars in the area of Knossos, Schliemann moved south to Crete in 1886. He had excavated four Mycenaean palaces on the Greek mainland and came with high hopes of finding a fifth. But Crete was then held by the Turks. They demanded that Schliemann purchase the 2,500 olive trees they declared were on the site. Schliemann could count only 889, and negotiations came to an end.

Then in 1893 the Englishman Arthur Evans, a Balkans correspondent with a side interest in Aegean archaeology,

Crete's geographical position makes it a stepping stone between Europe, Africa, and Asia.



arrived in Crete. He had learned that some Bronze Age "seal stones" bearing a primitive form of writing had been found at Knossos. He was especially interested because no Bronze Age writing had yet been found anywhere in Greece. When Crete was liberated from the Turks in 1898, Evans was able to purchase the Knossos site and, in the following year, start digging. An associate, D. G. Hogarth, describes the first day of his excavation: "For us then and no others Minos was waiting when we rode out from Candia [now Herakleion]. Over the very site of the buried throne a desolate donkey drooped, the only living thing in view. He was driven off and the digging at Knossos began."

The palace was everything Evans could have hoped for: rich, cultivated, and enormous. The dig turned up delicate gold pendants, finely wrought seal stones the size of a button, hundreds of writing tablets, and pottery galore—some extraordinarily thin ("eggshell ware"), some with particularly vibrant colors and curvilinear patterns ("Kamare ware"). The palace had spacious halls, a broad, four-flighted "grand staircase," which had been held together for more than three millennia by the rubble that fell around it, and an elaborate drainage system of jointed terracotta piping, complete with flush toilets (Versailles couldn't match this until the nineteenth century A.D.). And there were frescoes: one of a ruby-lipped lady with large, seductive eyes (Evans dubbed her "La Parisienne"); another of a wily cat stalking a pheasant; a third of a "priest-king" crowned with lilies and peacock feathers. There was even a gaming board that looked like a complicated version of parcheesi. Evans also found a faience statuette of a goddess—bare-breasted, with flounced skirts, snakes in either hand, and a cat on her head.

Evans knew almost immediately that the palace he was uncovering was quite unlike anything Schliemann had found on the mainland. He called it the Palace of Minos, and named the ancient Cretans the Minoans (what they called themselves is still unknown).

John Pendlebury, Evans's assistant and a particularly industrious archaeologist, once walked all over Crete to establish the communication routes among the various Minoan centers scattered around the island, which is only 156 miles long and 36 miles across at its widest point. But Crete's location at the center of the eastern Mediterranean gives the island a geographical, cultural,



Among the items Evans found at Knossos were carved seal stones such as the two shown above (left). Clay impressions from such stones, stamped on cords wound around containers, indicated ownership. Several statuettes of goddesses holding snakes (right) have been found. Scholars have inferred from these figurines a Minoan belief in the snake as the genius, or guardian angel, of the household.

and commercial importance out of proportion to its size. For Crete forms the stepping stone between three continents—Europe, Asia, and Africa. It was here that the spirit of civilization was nourished for two millennia, brought, as it were, in the ships of the ancient Cretans from Egypt, Mesopotamia, and Asia Minor, and then passed on to Athens and the West.

Evans devoted the rest of his life to the Minoans. Unlike the reckless, treasure-seeking Schliemann, Evans was meticulous in his attention to details—his final report, *The Palace of Minos*, runs six volumes.

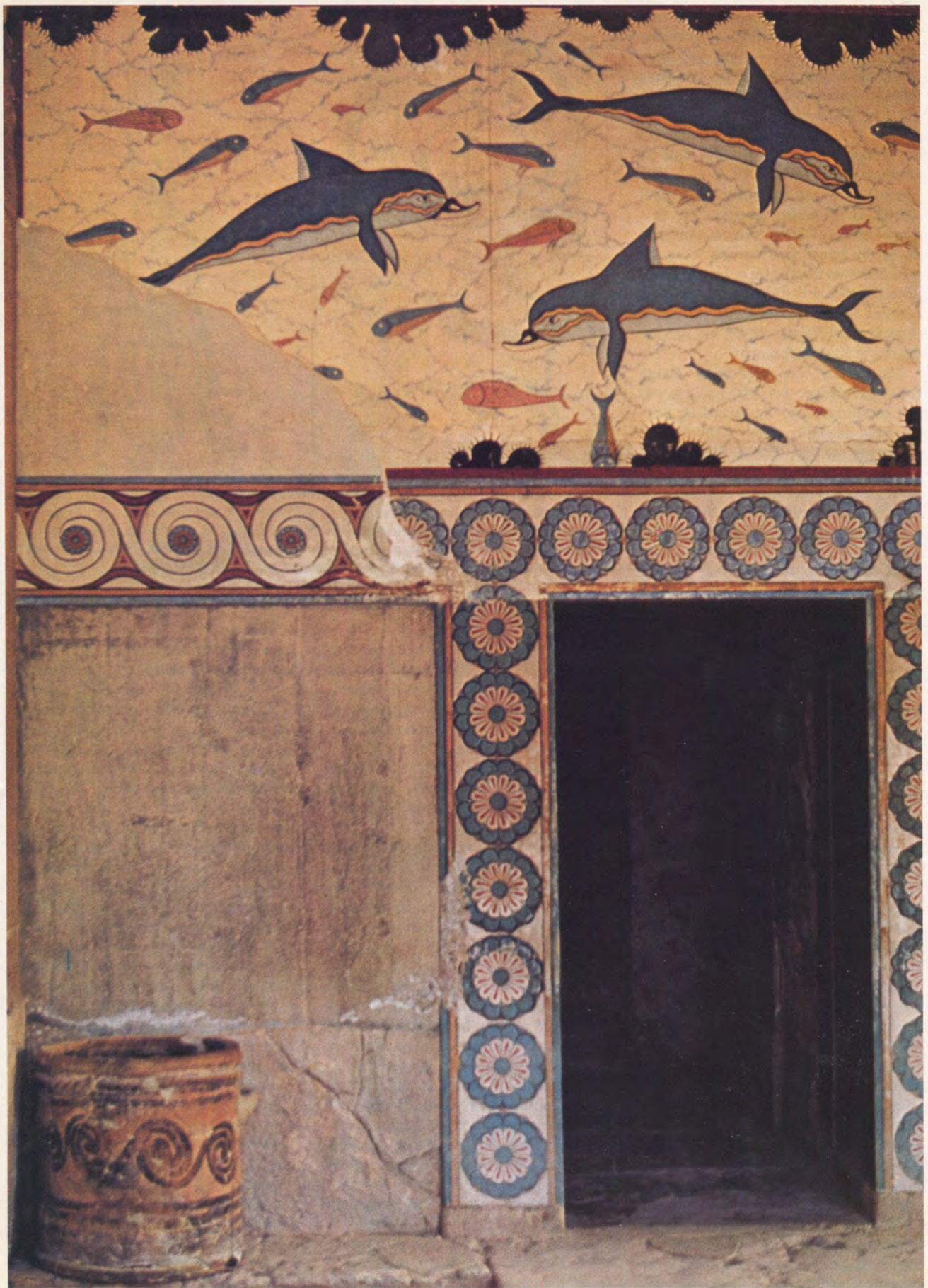
Based on the best evidence he could assemble, Evans reconstructed much of what he recovered so that the visitor to Knossos today gains a vivid sense of life in a Minoan palace.

The Palace of Minos is not an integrated, harmonious whole. It was built piecemeal around a large central courtyard, from which it sprawls out in every direction. The courtyard is its unifying element, and it was here that the celebrated Minoan bull games probably took place.

No one knows the precise purpose of the bull games. Most likely, they were a festival occasion. Villagers probably

came in from the countryside and observed the proceedings from stands erected around the courtyard; a palace fresco pictures such a gathering. Boxing, dancing, music, and acrobatics were popular entertainments and may have been associated with the bull games. In her novel *The King Must Die*, Mary Renault suggested that the fearsome bull-leap was actually performed by hostages because the Minoans would not attempt it themselves. It certainly looks dangerous. Frescoes, seal stones, and vases depict the final incredible leap, which is performed by women as well as men: grabbing the horns of a charging bull, the acrobat vaults head first onto the animal's back and from there somersaults to the ground. Many authorities, however, are skeptical; Spanish toreadors and American rodeo stars have all said that such a leap would be suicidal, if not impossible.

In any case, the event was not a bullfight. There were no weapons involved. It was primarily a show of agility and daring. The Minoans had little taste for violence. With their powerful fleet, they must have commanded the respect of their Mediterranean neighbors; warfare was not unknown to them. But they cared more for a life of ease, luxury, and beauty. Their palace walls were lined

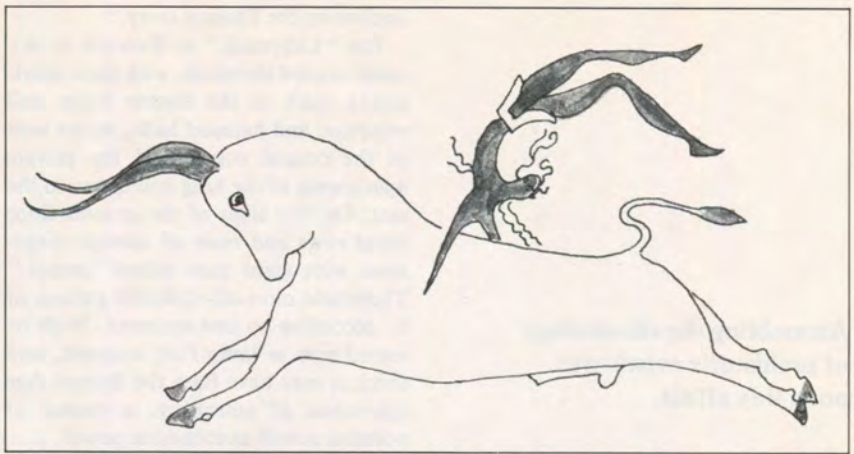


with gay frescoes revealing an endless fascination with the forms of nature: dolphins cavorting in rippling blue water, partridges eyeing a hoopoe, a leashed monkey gathering saffron. They lived comfortably, too: besides the extraordinary plumbing, the palaces had an ingenious system of light wells set off by doors that allowed just the right mixture of light and air without admitting any dampness.

Broad-shouldered, straight-backed, and slim-waisted, to judge by their self-portraits, the Minoans of both sexes wore their hair long and decorated themselves with jewelry. The men characteristically wore kilts, the women long, flounced skirts and tight corsets, which left their breasts exposed. The women also wore make-up. The wall paintings show no distinction in dress between the Minoans and their gods. In fact, it now appears that Evans's luscious "Parisienne" is actually a goddess. The Minoans seem to have felt at ease with their gods. They had places for public worship, but archaeologists have also found a number of domestic shrines, containing statuettes of the so-called snake or household goddess, and other religious objects.

The grand palace that reflects this sophisticated life style was rebuilt three times. Evans attributed the intervening destructions to earthquakes, which still imperil the island. (At least one traveler to Crete has noted that the roar of an earthquake sounds very much like a frenzied bull stamping its feet and bellowing—a fact that may account for both the Cretan bull cult and the association of bulls with Poseidon, the Greek god of earthquakes and the sea.) The final palace, the one that has been partially reconstructed, evolved by integrating the separate blocks of the earlier palaces. This gives the place a labyrinthine aspect, but it is hardly a maze as

The Minoans' wall frescoes offer vivid hints of their vanished life and tastes. The "Dolphin Fresco" from the palace at Knossos (opposite) is an excellent example of the realistic Marine Style of later Minoan art. It was pieced together from fragments found scattered about a room Evans believed was the queen's bedchamber. The plaster-relief fresco of the "Young Prince" or "Priest-King" (right) was found on a corridor wall in the palace. The young man, wearing a crown and necklace of sacred lilies, is otherwise dressed in the common fashion of Minoan men.



The bull-leap, from a palace fresco. Some feel the acrobat really jumped sideways over the bull, but Minoan artists could not draw this in proper perspective.



Assembling the chronology of prehistoric events was not a tidy affair.



The swirling Marine Style octopus on the upper pot reflects the Minoan delight in combining a twisting design (torsion) with an emphasis on a vessel's structural rigidity (tectonics). In contrast, the more symmetrical octopus on the lower pot is typical of the Knossos pottery produced after the Mycenaean invasion.

implied by the Theseus story.*

The "Labyrinth" at Knossos is oriented toward the north, with state apartments, such as the throne room and reception and banquet halls, to the west of the central court, and the private apartments of the king and queen to the east. On two sides of the ground floor stand rows and rows of storage magazines with giant pots called "pithoi." These held olive oil—240,000 gallons of it, according to one estimate. With its varied uses as lamp fuel, unguent, and food, it may have been the Bronze Age equivalent of petroleum, a source of political as well as economic power.

Three other major palaces have by now been excavated, all of them once linked by paved road to Knossos, and all of them following the plan of the Palace of Minos on a reduced scale. Their locations seem to have been chosen as much for the view as for any other consideration: Phaistos on its splendid hill near the coast, due south from Knossos; Mallia by the sea to the east; and Zakro, uncovered only recently, on the island's easternmost tip. Smaller settlements have been found by the dozen, chief among them the villa at Hagia Triada, near Phaistos, and the town of Gournia, first dug by an energetic American woman, Harriet Boyd Hawes, in 1901.

These places, lacking natural defenses and protective walls, suggest rulers who feared neither revolt nor—thanks to their navy—invasion. This corroborates Thucydides's claim that Minos ruled the first "thalassocracy" (state relying on sea power).

Using the evolution of pottery styles, Evans constructed a system of relative chronology consisting of Early Minoan (2700-1900 B.C.), Middle Minoan (1900-1550 B.C.), and Late Minoan (1550-1100 B.C.). These

*The palace was in fact called "Labyrinthos," a Cretan word meaning simply "Palace of the Double-Ax." The symbol of this double-ax is widely inscribed in the palace walls and probably had some cult significance. How, then, did labyrinth come to mean maze? At least one authority claims that it was indeed the labyrinthine quality of the palace ruins that inspired a new Greek meaning to the Cretan word. Others say that an entirely separate labyrinth is responsible, this one in Egypt. Built around 2300 B.C., it too was called "Labyrinth," meaning, in Egyptian, "temple at the entrance of the lake." Herodotus and Strabo both noted the palace in their accounts of travels in Egypt, so the word could have entered the language through them. They each say that this Egyptian labyrinth was enormous and complex, but neither describes it as a maze. The mystery continues.

divisions have since become so minutely subdivided that archaeologists now speak glibly of such cumbersome beasts as LM III A 1. Evans found artifacts from all over the eastern Mediterranean interspersed with Minoan handiwork, attesting to the Minoans' wide-ranging commerce. The Egyptian ware was particularly useful, for these pieces could be assigned an absolute date. By cross reference to Egypt, then, an absolute Minoan chronology could be secured.

Assembling the chronology of prehistoric events, however, was not such a tidy affair. The wrangle that captivated Aegean archaeologists for thirty years concerned the final era of the Palace of Minos, LM II, 1450-1375 B.C.

Evans felt that this was the time when the Minoans at Knossos finally came into their own. Around 1450 B.C. fashions certainly changed. The sprawling, swirling, wide-eyed octopus—a characteristic Minoan motif—of the Marine Style gave way to a more regularized version of an octopus—upright and symmetrical, if a bit spindly. Evans called it the Palace Style; his assistant, Pendlebury, called it "the pottery of empire." Similarly, there was a new rigidity in the frescoes and a new militarism in their motifs. Special warrior graves dating from this time were found in the countryside, and a throne room—unique in Crete—complete with a pair of heraldic griffins, was found in the palace. Around 1450 B.C. writing styles changed as well. In the ruins of the fire that finally consumed the palace Evans found tablets that he could distinguish from those found at other strata and at other sites on the island, although he could not decipher them. He called this new script Linear B.

Meanwhile, back on the Greek mainland, Professor Carl Blegen, an American, and Professor A. J. B. Wace, an Englishman, among others, had uncovered throne rooms, frescoes, graves, and pottery closely resembling those found by Evans at Knossos. How had these architectural and artistic details gotten to Mycenaean Greece? The "mainlanders" believed that they were Mycenaean in origin and were brought to Crete when the Mycenaeans invaded, conquered Knossos, and rebuilt the palace more to their liking, sometime around 1450 B.C.

Evans found that hard to swallow. He stoutly maintained that it just wasn't possible: the excavation had revealed no archaeological "break," no abrupt transition, which such an invasion surely would have produced. He preferred to



The restored frescoes in the reconstructed Hall of the Colonnades represent "figure-of-eight" bull's-hide shields. They are a good example of the new militarism apparent in Minoan art following the Mycenaean invasion.

believe that the Mycenaean settlements were merely Minoan colonies that aped the latest styles of the motherland. Having devoted a life's work to the Minoans, Evans was not particularly charitable to those who sought to belittle them by suggesting that they might have been conquered. Soon after the dispute broke out, Professor Wace was relieved of his post as head of the British School of Archaeology, under conditions that strongly suggested Evans's complicity.

Yet Evans refused for years to divulge the only evidence that might have resolved the controversy, the Linear B tablets, reserving the satisfaction of translating them for himself. A slight, near-sighted man with a walking stick he called "Prodger," Evans nevertheless held firmly to his position. As one critic described Sir Arthur: "It was as if the spirit of the place [Knossos] entered him; he seemed to put on the mask of the priest-king and seat himself on the gypsum throne."

The turning point in the controversy came one bright morning in 1938 when Professor Blegen, digging in Nestor's legendary home of Pylos, on the

southwest of the Peloponnese, found some Linear B tablets in the mud. These were the first such tablets found anywhere on the Greek mainland. Blegen resolved to publish them as soon as possible, but the War intervened, delaying publication until 1951. By that time Sir Arthur Evans was dead.

A year later, Michael Ventris, a thirty-year-old British architect, announced over the BBC that he had solved the problem that had wrinkled so many scholars' brows: Linear B was Greek—a difficult, archaic form of Greek, but Greek nevertheless.

Archaeologists were astonished. Expert opinion had ranged the Mediterranean from Anatolia to Libya for the origin of the script. Ventris himself—having been inspired at thirteen when he heard a lecture by Evans—set out under the assumption that Linear B was Etruscan (an unhappy choice, because little was then known about Etruscan). That possibility exhausted, it occurred to Ventris that the language might be Greek. Using methods similar to those of wartime code-breakers, Ventris deciphered Linear B in less than a year.

Michael Ventris's method produced such plausible translations that almost all the experts accepted it immediately, even though many had anticipated notable literature to emerge, and were sorely disappointed. The tablets contain nothing but bureaucratic lists, monotonous inventories of goats, pots, daggers, and olive oil. Yet they do resolve the Minoan-Mycenaean controversy. For the fact of the tablets' existence on both the mainland and Crete, plus the fact that they bear a form of Greek, points to no other conclusion than the one suggested by Wace and Blegen three decades before the decipherment: Mycenaean Greeks conquered the Minoan capital of Knossos in 1450 B.C. They were therefore responsible for the Palace Style that Evans so admired.

As usual in scientific fields, the resolution of one question only led to the formation of another. How could the Mycenaeans have taken over a flourishing civilization like that of Knossos without producing what Evans called a "break"?

In 1939 an archaeologist in the Greek

been a flourishing commercial center. As at Pompeii, the volcano ended up preserving what it destroyed. Marinatos found two- and three-story houses completely intact. Using techniques developed by Pompeian archaeologists, he made plaster impressions of wooden furniture that had burned up in the cataclysm: a bed, stool, and hamper, for example. Marinatos even found evidence of second-floor flush toilets with wooden seats. There was extensive pottery representing all the styles through LM I A (1550-1500 B.C.), so Marinatos accordingly downshifted his previous estimate of the Thera explosion twenty years, to 1500 B.C.

When did Thera explode? That's the big question. Marinatos has interpreted the evidence to indicate sometime around 1500 B.C., with the Mycenaean invaders coming around 1450 B.C. to sack and burn all the cities and towns of eastern Crete and to seize Knossos. In this view, the Minoans' crops were ruined by volcanic-ash fallout and their navy was wrecked by tsunamis, but the palaces survived for fifty years, during which time the Minoan artisans produced the Marine Style pottery (the swirling octopi and sea shells) of LM I B. Many archaeologists have been tempted to somehow explain away this intervening period of LM I B—1500-1450 B.C.; shift the Thera explosion down; the invasion up; and posit the tidier theory that the eruption was responsible for both disasters, with the Mycenaean arriving immediately afterwards to capitalize on Crete's destruction.

In the 1970s considerable progress has been made in this direction. Professor J. V. Luce of Trinity College, Dublin, has summarized the latest developments in an article published last year. In his analysis, the absence of any sign of looting in the recently excavated palace of Zakro, the lack of unburied skeletons anywhere on the island, and the widespread and apparently simultaneous nature of the destruction all point to the likelihood that the volcano and not an invasion was responsible.

It has been argued that in an age before gas and electricity such eruptions were unlikely to cause fires. Luce ingeniously counters that the dust spewed into the air by the initial outbursts could have blocked out the sun, as happened with Krakatoa, whereupon the Cretans lit lamps, which overturned in the final cataclysm and set fire to the island.

Furthermore, Thera ash, previously thought to have been dumped in 1500 B.C., at the end of LM I A, has been

found on Crete's southern coast at LM I B (1500-1450 B.C.) levels. As for the Marine Style pottery, said to date from the years between the explosion and the invasion, Luce follows other experts in arguing that it does not warrant assignment to a distinct period.

Against these arguments, however, stands the recent discovery of two distinct strata of I A and I B pottery on the royal road at Knossos. There are other obstacles as well, such as the fact that Knossos—the city on Crete closest and therefore most vulnerable to a Thera eruption—was not destroyed, and the problem of how the Mycenaean ships escaped the tsunamis. But the most damning evidence of all is the complete absence of Marine Style pottery from Akrotiri, pottery undoubtedly developed in the years before the invasion, whatever date one assigns to it. So, on balance, the most likely hypothesis remains that of a Crete so severely weakened by an eruption, circa 1500, that even fifty years later Mycenaean invaders could put the torch to it and take Knossos for their prize, unresisted.

As Robert Graves and others interpret it, the Theseus myth explains how this might have happened. In their analysis, the myth describes a Mycenaean hero who sails to Knossos as part of a tribute to a hated Cretan overlord, Minos. The hero brings an end to Minoan supremacy in the Aegean by overcoming not a bull-headed monster, but a Cretan commander, named Taurus, in a naval battle. He marries Ariadne as ratification of a peace treaty that places a Mycenaean on the Cretan throne. Of course, the myth says nothing about the burned palaces elsewhere on the island, but it does explain how the Mycenaean moved into Knossos without producing an archaeological break.

Knossos lasted three generations under its new rulers. Then, around 1375 B.C., on a day when the wind blew so hard from the south that the flames were horizontal, the Palace of Minos burned. No one knows why. According to Pendlebury, the throne room was in a state of confusion when Evans found it: "A great jar lay overturned in one corner, ritual vessels were in the act of being used when the disaster came. It looks as if the king had been hurried here to undergo too late some last ceremony in the hopes of saving the people."

In the Sixties Evans's estimate of 1375 B.C. for the terminal date of the palace came under vigorous assault by Professor L. R. Palmer, an Oxford philologist, who declared that the palace survived

until the twelfth century B.C. Palmer, however, by now has been largely discredited.

But there is one consideration that Evans's date overlooks: the evidence from Homer. In *The Iliad*, the naval delegation of the Cretan Idomeneus was second only to Nestor's in the catalogue of ships. Evans said that there was merely a vagrant, "squatter" population at Knossos after 1375. If so, then Idomeneus would certainly not have been able to muster such a fleet in 1200, the date now accepted for Homer's Troy. Although this contradiction remains unresolved, everyone does agree that the last remnants of the Minoan civilization were destroyed when the Dorians invaded Crete in 1100 B.C.

Thirty-five years after Evans's death, excavations on Crete continue to be carried out by the British School of Archaeology. One of the members of the school, Hugh Sackett, a tall, energetic Englishman with prematurely white hair, has assisted in the excavation of a Minoan mansion buried under a hill near the Palace of Minos. Evans had known about the place but left it unexplored. He was wise, for the earth contained extensive remains of practically every transient culture on Crete since Minoan times: Turkish, Arabic, Venetian, Roman, and Greek. Worse, all of these settlers had the unfortunate habit of burying their garbage in great pits dug down into previous floor levels. The result is a huge, jumbled layer cake that fell in some places.

Sackett points out that arguments over archaeological evidence often assume the facts are cut and dried. They never are. The stratigraphy, for example, hardly ever reveals a clear progression from A to B to C; rather, it involves, as at the hillside mansion, confusing gaps between A and C, overlappings of B and C, intrusions of C onto A, and so forth. Consequently, field archaeologists have to rely on their intuition if they are to put such chaos into order, and they can be wrong. But laymen, and philologists, are even further wrong if they assume automatically that A lies above B and B above C. "You could prove that LM II bordered on the Neolithic age that way," says Sackett.

The pottery styles by which chronology is determined are similarly indefinite. Experts regularly classify potsherds on the basis of no more than the haziest dab of paint here or blotch there, or just by

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the "feel" of the thing, its porousness or gloss.

In addition to these standard technical problems, Sackett and his fellow archaeologists have other worries. During digs, they stay in a small cottage at the foot of the driveway of the Villa Ariadne, the splendid stone mansion Sir Arthur Evans built for himself. Just across the street is the "Ariadne" discotheque, whose raucous music regularly keeps the archaeologists awake until four in the morning. The archaeologists must get up at six in order to finish the day's digging before it gets too hot (in the afternoon, temperatures in the trenches often reach 110°). The pressures of an excavation are hard enough when one is fully rested; without sleep they're almost impossible. According to Sackett, one of the archaeologists became so tired and so frustrated by the situation that he broke down and wept.

Now entrepreneurs have wangled from Athens a permit to build a second discotheque at Knossos, even though the Cretan archaeological authorities had forbidden the project because of the antiquities believed to lie on the property. "What's needed," says Sackett, "is a whole no-build statute for the entire Knossos area." That way a systematic excavation could be made of a region that is literally thick with Minoan settlements. As it is, archaeologists are empowered by law both to stop builders before construction begins (or, as in the case of the new discotheque, *try* to stop them) and to halt them afterwards in order to perform "rescue digs"—hasty excavations of what bulldozers have stumbled onto. But this requires time and effort that, with their own tight schedules, the archaeologists cannot afford to spend.

Sometimes the archaeologists do win out. On the south coast of Crete, Professor Joseph Shaw of the University of Toronto has been directing an excavation at Kommos, hunting for a harbor town on the bluff above the sea.

Shaw likes harbors. A wall protruding from a nearby rocky outcrop and numerous shards indicated a Minoan settlement of some sort; in addition, the

bits of pottery were so well preserved in the limestone-free soil that Shaw felt a dig was fully justified. He therefore asked the government to expropriate the land—that is, to require the owner to sell it at the going price. As it happened, the owner had just completed plans to build a resort on the property, with a hotel going up exactly where Shaw wanted to dig. The government upheld Shaw's cause, and the excavation began last July. It was to continue through August—a routine Shaw expects to maintain for five years. His team consists of two pottery experts, one veteran Minoan archaeologist, two younger archaeologists, a surveyor/artist, plus a dozen workers, all inexperienced.

At eleven the first morning of the dig, most of the villagers appeared, along with the mayor, a representative of the Greek Archaeological Service, and two Greek Orthodox priests who sprinkled holy water and wafted incense about. When the site had been thoroughly blessed and food and wine had been passed around, everyone went away.

A visitor slogging up the hill from the beach to the site one morning last summer found great excitement, and Professor Shaw, a wiry, fortyish man in hiking shorts, exclaiming something about "lovely bedrock." In a two-by-four-meter pit stood two Greek workmen variously brushing away or digging up a pile of stones; two American trench supervisors directing them in Greek, picking up potsherds and spitting on them in order to make out their design; and a large pile of rocks that was growing smaller and cleaner by the minute. In one corner stood yesterday's thrill, still in place: a foot-tall "snake tube" (once, though no longer, thought to house snakes for ritual purposes). The surveyor/artist sat cross-legged on the edge of the trench drawing this peculiar tube *in situ*. On another side sat Shaw, smoking and watching carefully. Across from him, two more workers sifted dirt from the trench into a wheelbarrow. Somewhere at the bottom of this melee was the small, horizontal slab that was the cause of today's excitement. They had found the floor.

The site had been carefully portioned off into sections, since the establishment of stratigraphical coordinates is necessary for determining relative chronology: nowadays, perhaps the most important thing about a find is precisely in what section and at what depth it was discovered (the specter of the reckless Schliemann is conspicuously absent). The party had been digging four of the

most promising sections. One section had had to be abandoned after a week—"A dud," said Shaw, wistfully. Another trench was just being started. A third had produced a wall and a threshold that turned out to be a *former* threshold refabricated as a bench (a common practice). The fourth trench, however, was unquestionably the prize.

A neat circle of stones, like a miniature Stonehenge, had emerged in the center of the pit, with a fairly timid line of stones leading away from it. "A nice interior wall, just right," said Shaw. Then, as if to some unspoken accusation, "No, I don't think we created it. There *is* something there." He was understandably edgy, because almost anything can be constructed from a heap of rocks, merely by taking some of them away. So archaeologists spend much of their time deciding which stones have tumbled in (warranting their removal) and which ones really belong.

Of course, there are those rock configurations that defy interpretation, no matter what one does. Shaw ran into one of these at Zakro. "We had a trench there that we called 'the headache,'" he recalled. "We just couldn't make any sense of it. Each year we'd come back, poke around a little more, then leave it for the next year." With a laugh he added, "We never did make sense of it."

The Kommos trench presented no such problem. Before the day was out, it had yielded another floor level, with a terracotta brazier (portable hearth) in the corner, flanked by two vertical stones. "I think we have a nice little domestic scene here," Shaw remarked.

The little domestic scene had never had so much attention. It was photographed from every angle by four cameras and also sketched. Then with his penknife Shaw slipped the brazier out of the earth into a Baggie.

The excavators had been at work since six and it was now almost three-thirty. High time to quit. So they gathered up their equipment, their snake tube and brazier, as well as several buckets of shards, and bid the workers good-bye. Then a table, chairs, and a large basket were carried from the toolshed, and all sat down to lunch.

So Aegean archaeology progresses, snake tube by snake tube, brazier by brazier, in its effort to resurrect a civilization that fell three thousand years ago. In the face of the realities of modern Crete—its resorts, bureaucracy, discotheques—and the complexity of the subject, this is a heroic undertaking. And

there are also critics who question the value of the recent archaeological discoveries. They point out that in the first five years of his excavations, Evans unearthed most of the Palace of Minos and many of the neighboring buildings—and uncovered an entire civilization. By contrast, after five years at Kommos Professor Shaw will have found—if he is lucky—the Phaistos harbor, perhaps some museum pieces, and probably enough evidence to resolve some chronological disputes but raise others.

Furthermore, as the science of archaeology develops, specialists from other fields—geology, philology, ceramics, volcanology—encroach more and more on territory that once was the exclusive preserve of field archaeologists. Squabbles such as the one involving the philologist L. R. Palmer's date for the fall of Knossos are the natural result.

Finally, critics argue that the Aegean archaeologists are too little concerned with relating their discoveries to the problems of the modern world. They would prefer that archaeologists consider the psychological, anthropological, and sociological connections between the two ages.

There is some merit to all these charges. The law of diminishing returns has struck Aegean archaeology. Specialists do need to be called on in the interest of getting the best information possible on problems beyond the scope of a field archaeologist's expertise. On the other hand, to avoid the bickering that resulted in the case of Palmer, specialists should be careful to consider the often fuzzy evidence from the trenches firsthand, so that they may fully appreciate the problems involved.

As for questions of the relevance of the Minoan civilization as currently examined, it is as relevant as the Greek or Latin language. Like dead languages, dead civilizations feed into living ones. In those faraway people, the Minoans, lie our origins. More than this, Minoan archaeologists are revealing to the world an age of beauty that would otherwise be lost, beauty that is valuable for its own sake. For when the Minoan civilization came to an end, in John Pendlebury's words, "Something went out of the world which the world will never see again; something grotesque perhaps, something fantastic and cruel, but something also very lovely." □

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VITA:

Tycho Brahe

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studies is doubly astonishing. In the first place, he seemed within grasp of his Tychonic system as early as 1578, as the Vatican manuscripts reveal; and secondly, the 1583 measurement of the distance to Mars, on which he based his final commitment, just has to be invalid. (Mars really was closer than the sun, but, as Kepler was to demonstrate, Tycho's observations were too imprecise to show it.) In a letter to a Wittenberg astronomer, Tycho later admitted that his earlier belief in the traditional crystalline spheres had for five years prevented him from taking the otherwise obvious leap to the Tychonic system.

Tycho inaugurated his new cosmological scheme in a book on the Comet of 1577—a volume printed in his own shop at Uraniborg. He next planned a splendid book describing his instruments, and he began to print a thick technical treatise called *Exercises in the Reform of Astronomy*. But meanwhile things had begun to go badly at Hveen for the brilliant but petulant astronomer. Frederick II had died, and it soon became plain that Tycho would no longer have the lavish government subsidies to which he had grown accustomed. His high-handed manner and his neglect of tenant rights on his fiefdom had undermined his standing in the royal circle.

In a bluff, Tycho packed up his celestial machines and prepared to leave Uraniborg. King Christian made no countermove, and in the end the astronomer and his entourage migrated to

the court of Rudolf II in Prague. The glorious instruments were never properly set up again, and were completely ruined not long afterwards in the Thirty Years' War. But Tycho did not live to see that sad destruction—he died in 1601, after scarcely more than two years in Prague.*

Tycho's last days in exile from his Danish homeland would touch us as a tragic ending, fitting for Hamlet, except for one of those curious twists of history: by going to Prague, Tycho was finally able to persuade the young German astronomer Kepler to join his staff. It would be difficult to imagine a better heir for Tycho's treasure-trove of celestial observations. An inspired theoretician, Kepler forged a new planetary theory that improved the accuracy of predictions nearly a hundredfold.

Still, Tycho deserves to be remembered for more than just his systematic and precise observations. His geocentric cosmological scheme soon fell on the scrap heap of discarded theories, but his insistence on a credible physics and his daring rejection of the crystal spheres set the stage for some alternative mechanism to move the planets. Kepler took up the torch. He proposed that magnetic forces acting over empty space propelled the planets, and thus paved the way for Newton's theory of universal gravitation. Tycho Brahe does not rate as the world's greatest cosmologist, but nevertheless, his cosmological ideas have profoundly influenced the development of modern science. □

*His demise followed a baronial banquet; Kepler, in a final report added to Tycho's observing book, wrote, "Imbibing somewhat liberally, he felt as if his bladder were going to burst, but he placed civility ahead of health." Prostate difficulties, not a burst bladder, caused Tycho's death eleven days later.

So live so green

In my hand so live so green to toss away
I scratched them instead in the slope by a rock
below the frail windflower—
three little prunings
white pine.
Half a year later
pushing the snow aside
to look for the earliest hint of spring
I found one stick and two small sturdy trees.

— ALICE CARVER CRAMER