Gem-Pa-Aton: A Home for Egyptian Monotheism

One of the temples built by the reforming pharoah Ikhnaton has been unearthed near Karnak. It assists in better understanding history's first recorded monotheistic cult.

BY DIETRICK E. THOMSEN

Ancient Egypt was the longest-lived civilization in recorded history. And in the millenia that it lasted, it suffered very little change. An all-pervading mummified conservatism was its hallmark through most of that period.

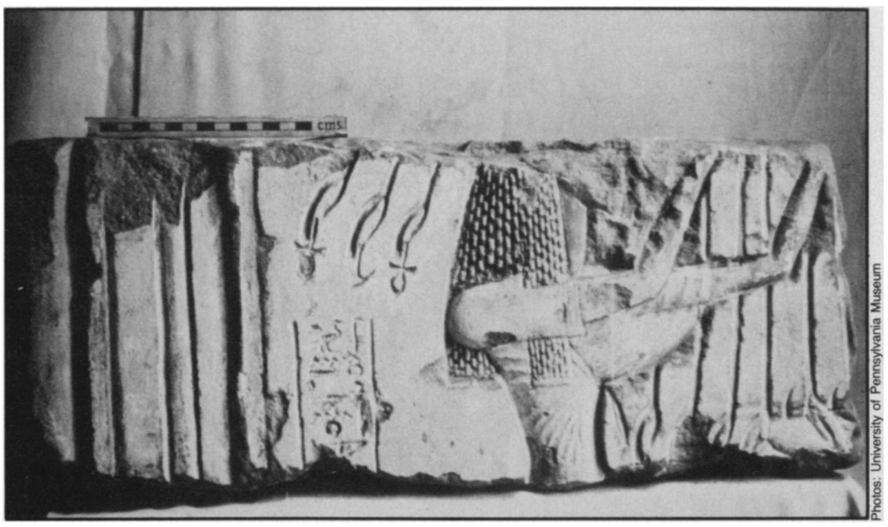
Ancient Egypt had so many pharoahs that they are arranged in more than two dozen dynasties to help historians remember them properly. Students who complain about memorizing all the kings since 1066 should contemplate the task of the ancient Egyptian schoolchild. Of all these pharoahs only one really tried to change anything. This radical reformer called himself Ikhnaton, and during his reign (1369-1352 B.C.) he tried to change the ideological basis of Egyptian civilization by substituting monotheism for the traditional polytheism.

Although Ikhnaton was a flash in the pan as far as ancient Egyptian life was concerned, he is fascinating to historians largely because he was history's first recorded monotheist in high places. The development of the so-called higher religions has generally tended from polytheism to monotheism (to atheism in the case of Buddhism), and Ikhnaton is looked upon as a spiritual pioneer.

The latest news from Luxor, one of archaeology's most famous datelines, is that the ruin of one of the temples built by Ikhnaton for the worship of his single deity has been unearthed by an expedition headed by Donald B. Redford of the University of Toronto. The Ikhnaton Temple Project, as the effort is called, is sponsored by the University of Pennsylvania Museum.

The ruin or ground plan of one of Ikhnaton's temples has long been sought in order to aid archaeologists in the interpretation and reconstruction of such relics of that pharaoh as they have so far unearthed. The artifacts of Ikhnaton's reign have suffered more than the ordinary detriments of time, robbery and ignorance that other Egyptological material has undergone. They were subject to a deliberate attempt by his immediate successors to erase his name from history, an attempt that came very close to succeeding.

Ikhnaton wanted to sweep away the entire Egyptian pantheon and replace it with a single deity called Aton, who was represented by the sun's disk. Why he of all people chose to do this is not clear, but because religious reform entailed consequent changes in architectural and sculptural styles (a more realistic manner of portrayal) we know that he was a physical cripple. At least one historical novelist (Mika Waltari in *The Egyptian*) has surmised that Ikhnaton was subject to epilepsy or some other kind of neurological seizures, during which he had mystical visions. He even changed his given name from Amenhotep (a traditional pharoanic name that associated its holder with the chief traditional god, Amon-Ra) to Ikhnaton to emphasize his association with the new deity.



Photos: University of Pennsylvania Museum

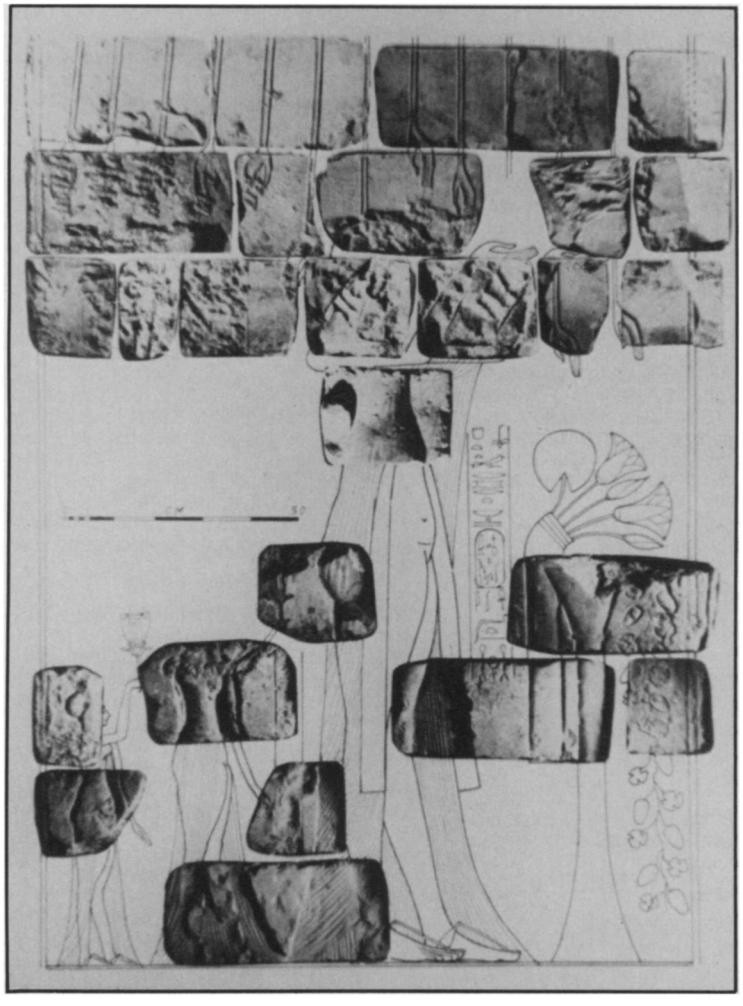
A single block that shows a woman of the royal family making an offering to Aton.

Although courtiers and those who wished Ikhnaton's favor practiced the new religion sincerely, grudgingly or cynically as the individual case might be, the attempted reform from the top did not go down well. It ran counter to the interests of the traditional priesthoods, especially those of Amon-Ra, who formed powerful aristocracies that controlled much of the country's real estate. In the end they showed that even a pharaoh could not cross them and get away with it. Nor did the common people, whom Ikhnaton may have hoped to rally to his cause, show any enthusiasm for the new religion even though the destruction of the traditional priesthoods would have freed many of them from serfdom.

Like the English bishops during Cromwell's regime, the old priesthoods went underground. As soon as Ikhnaton's successor was enthroned, they surfaced with undiminished power and took their revenge.

Statues of Ikhnaton and his wife Nefertiti were smashed; his name was obliterated from inscriptions, and his temples were torn down. The rubble from the temples was used as filler in the walls and columns of new construction. It is from these shards of rubble, which are called talatat, that much knowledge of Ikhnaton's religious doings has been pieced together. Some 30,000 of these talatat have come to light, according to Froelich Rainey, director of the University of Pennsylvania Museum, and they form a gigantic jigsaw puzzle that can be put together with the aid of a computer and an endless number of photos. When you get a group together, says Rainey, it helps to determine the standard features of an Ikhnaton temple.

But what Egyptologists lacked were the dimensions of the walls in which the talatat once stood. "We did not know how the building was different from standard Egyptian temples," Rainey says. The



Using talatat to reconstruct a scene: Queen Nefertiti offering to the sun's disc.

finding of the ruined foundation gives the dimensions of the walls and will enable a reconstruction of the temple—visually and on paper only. A reconstruction in stone will not be attempted—there are probably not enough talatat anyway, Rainey says.

The discovery came just like in the movies. The Egyptian workers on the project were digging away near the famous temple of Karnak, in a place where the French archaeologist Henri Chevrier had found toppled statues of Ikhnaton in the 1920s. Suddenly Asmahan Shoukri, an Egyptian member of Redford's group, shouted that the workmen had found "laid stones." Redford ran down, and sure enough there it was: a bit of a wall. The workers also brought up 100 fragments of decorated relief, one of which identifies the building as the temple Gem-Pa-Aton, one of eight that Ikhnaton built to the glory of Aton around the ancient Egyptian capital of Thebes. Redford believes that the temple was built around a courtyard that was 200 to 300 yards long and that it was surrounded by a collonade of rectangular pillars bearing statues of the king. He intends to excavate further, following the wall around. The project is expected to take 10 years.

The talatat as pieced together show figures in procession doing religious things. The 100 most recently unearthed show a procession bearing the king to the temple to be received by bowing courtiers and priests. The direction in which the figures face can be used to determine which wall the stones belonged to. Since the ancient Egyptians, including Ikhnaton, built symmetrically, what is learned about any one wall will help determine the configuration of its opposite. And so eventually Egyptologists hope to know exactly what kind of building this early monotheist constructed for the public worship of his deity.

Because of his innovations and radicalism, Ikhnaton fascinates the modern imagination even more than he dismayed his contemporaries. Much has been written and speculated about him though little is really known. It may, in fact, be that his immediate successors did not quite succeed in obliterating his memory for later generations of his countrymen. It is several centuries from Ikhnaton's day to the time when Moses led the children of Israel through the Red Sea, yet some scholars would like to see an influence of his on the dawning Hebrew consciousness of monotheism and on through modern religion. Some purport to find resemblances between some of Ikhnaton's hymns to the sun and the psalms of the Hebrews. □

. . . Computation

other problems in the class NP share the distinction of the Satisfiability Problem. He called these problems NP-complete; they are sufficiently detailed to serve as prototypes for all other NP problems. Each NP problem can be transformed into any NP-complete problem and solved by appropriate adaptation of the solution algorithm for the NP-complete problem.

NP complete problems form a subclass of the class NP containing those of maximum difficulty. Karp (and others after him) showed that many famous problems of finite mathematics are in this class. These include the famous "traveling salesman problem" (find the shortest route that visits each city on a list exactly once), "0-1 integer programming" (linear programming in which variable values are limited to yes or no options) and "graph coloring" (assign a limited number of colors to regions in such a way that no regions with a common frontier receive the same color). The recent result of Garey, Graham and Johnson shows that the Steiner minimal tree problem is also of this type: It is NP-complete.

Most of the problems now known to be NP-complete have an extensive history of unsuccessful search for a polynomial-time algorithm. Recognition that they belong to the class of NP-complete problems shows that they are essentially equivalent problems. Thus the accumulated evidence of unsuccessful search for efficient algorithms for each of the several dozen NP-complete problems concatenates into an impressive record of failure.

Nearly half a century ago the mathematical logician Kurt Gödel astonished the mathematical and philosophical world by showing that in any sufficiently complex mathematical system there will always be intrinsically undecidable propositions—statements that can, by their very nature, never be proved or disproved. The status of NP-complete problems—if present beliefs are proved true—is somewhat analogous: They are problems that are sufficiently complex that, by their very nature, they cannot be solved in any practical amount of time. Gödel's work established the existence of problems that are theoretically unsolvable; NP-completeness points to the existence of problems that are computationally unsolvable.

Gödel's work on undecidable propositions led logicians away from a fruitless task (the complete formalization of all mathematics) and into more promising terrain. Similarly, the discovery of NP-completeness is right now turning applied combinatorial mathematics from the search for exact algorithms to the search for sufficiently good approximate ones. With this new focus comes a whole host of new and interesting questions concerning the establishment of standards by which an algorithm can be judged when we know that it is in the nature of things that it cannot be perfect. □