



The Millennium Project: Marathon Excavation to “Capture” Area A

FOR the last ten years we have been painstakingly chipping away at the massive site we call Area A on the Giza Plateau (see map on page 2), slowly excavating, mapping, and collecting artifacts. In the meantime, there are growing pressures from modern tourism and development. Yet our work has revealed very significant remains from the Pyramid Age that must not be lost.

This fall we are launching a marathon excavation to clear as much of Area A as possible. With a grant from the Ann and

Robert H. Lurie Foundation and help from our other supporters we will be carrying out back-to-back seasons of intensive excavations over the next two years. We begin this October and continue for eighteen and a half months of field work until December 2001 with breaks for the summer and winter holiday season.

Searching for a Workforce

When we first began this project in 1988 our goal was to learn about the social and economic infrastructure behind the great monuments of Giza. How was it possible

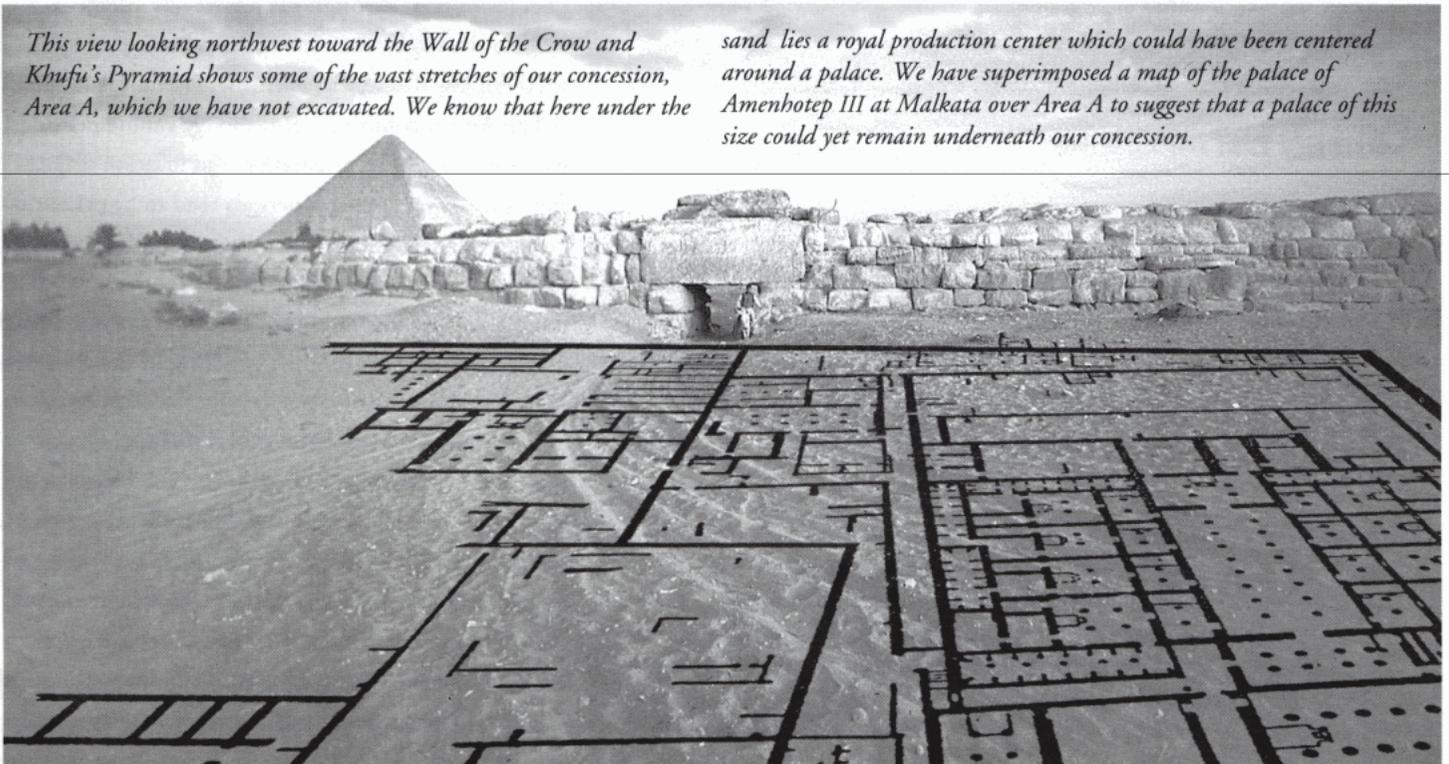
for the ancient Egyptians to build the three pyramids, as well as the Sphinx, and associated tombs and temples? Where was the immense workforce housed? How was it fed? Where was the pyramid town that we know from later periods would emerge with the construction of a pyramid?

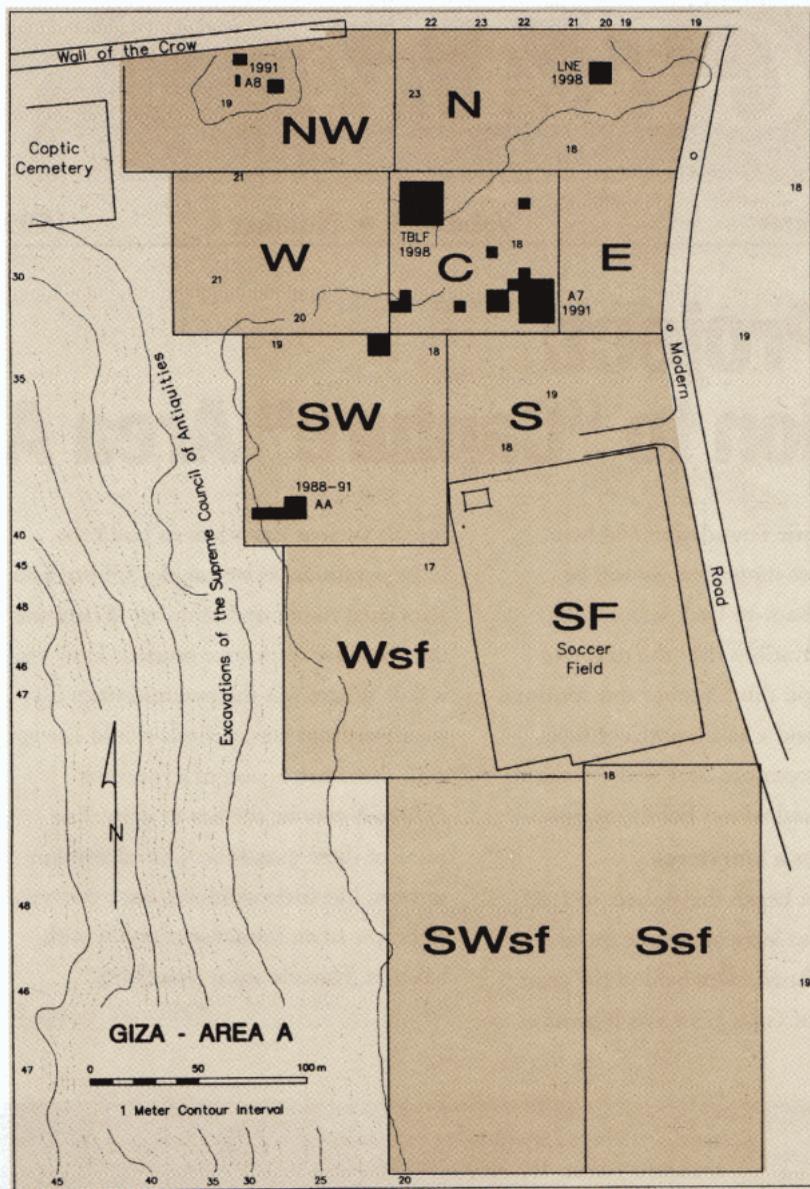
Area A may be the key to answering some of these questions. Our excavation squares, like little windows, have given us a glimpse of an immense complex with bakeries, fish and meat processing

Continued on page 2

This view looking northwest toward the Wall of the Crow and Khufu's Pyramid shows some of the vast stretches of our concession, Area A, which we have not excavated. We know that here under the

sand lies a royal production center which could have been centered around a palace. We have superimposed a map of the palace of Amenhotep III at Malkata over Area A to suggest that a palace of this size could yet remain underneath our concession.





This map of Area A suggests the vast scope of our Millennium Project. The large shaded area is our concession, all of which we hope to clear. The excavation squares from all our previous field seasons are marked in black.

Mission for the Millennium

Continued from page 1

facilities, pigment preparation shops, bakeries, copper workshops, and workers' houses. If this complex is part of the pyramid town, then somewhere in Area A or nearby there could be a royal palace.

A Palace in Our Midst

A palace from the Old Kingdom has never been found, but hieroglyphic texts and palace complexes from later periods, such as the New Kingdom palace at Malkata (the plan superimposed over Area A on page 1), offer clues to what we might expect in the Old Kingdom.

According to Egyptologists' understanding of hieroglyphic texts, towns sprung up next to royal pyramid complexes while they were under construction. Early in the history of these pyramid towns a royal residence was built for the king who would eventually be buried in the pyramid. Sealings with Menkaure's name have turned up in our excavations. Production facilities, like those we have uncovered in Area A could be attached to the royal residence (as well as to other houses such as those of officials, of gods [temples], and provincial governors).

Ancient texts mention the names of settlements close to the Giza Pyramids including one on the southern low desert, which is where Area A is located.

The Area A complex is also a likely candidate for a palace because of its orientation and location. Palaces from other sites and later periods tend to be oriented north-south at right angles to major temples and near the right front ("starboard") of these temples, which are themselves oriented east-west. Our complex is oriented north-south and lies on the right front of the exits from the pyramid temples.

In addition, the massive "Wall of the Crow," just north of our site, with its huge limestone blocks and gateway seven meters high, would have been a fitting wall to bound a palace precinct. Large walls and gates are associated with palaces of the New Kingdom.

Finally, our excavations offer one other intriguing clue—the site was "put to bed." In almost every square we see evidence that the architecture was purposefully razed and levelled in ancient times, near the end of the

Priority List for Clearing Area A

- Zones C and W** – First because of the importance of the facilities already excavated in C and the possibility of a royal residence in W.
- Zone SW** – Second because we know from previous field seasons that the settlement extends as far as Area AA, excavated in 1988-'91
- Zone NW** – To see if there is a road or approach to the gate in the Wall of the Crow.
- Zones N and E** – We expect to find less concentrated settlement here since our test in 1998 (LNE on the map), showed that this was the periphery of the settlement.
- Zone S** – The last area to be cleared in the northern half of Area A.
- Zone SF (soccer field), and Zones Wsf, SWsf and Ssf** – These are *terra incognita*. Depending on what we find in Zones S and SW, it may be possible to carry out test trenches in the soccer field. The areas south and west of the soccer field are enormous and will require gargantuan effort to clear and record. But there is a good possibility that settlement is not nearly so concentrated here as farther north in the concession.



Scraping, TBLF, 1998. By scraping with trowels we exposed the tops of mud brick walls. Note the white line marking the face of a plastered wall. We believe we can use the same technique of scraping to find the "footprint" of Area A structures, once the overburden is removed.

4th Dynasty, when Area A was abandoned. A palace belonging to Khafre or Menkaure would not have been left standing for squatters and looters to despoil.

Whether or not the palace is actually in our concession, we know that Area A was a vast royal complex which flourished during the 4th Dynasty with activity revolving around pyramid building. Unfortunately our excavation squares, concentrated in the north central part of Area A, have given us only a hint of the site. Vast areas of the concession still lie buried (see map on page 2).

Strategy

Our plan is to recover as much as possible of the general ground plan of the Old Kingdom architecture. Once we have some idea of its nature and extent we can carry out detailed, intensive excavation.

We will be using methods we developed in 1998 when we opened a 20 X 20 meter area we called TBLF ("The Great Leap Forward," see *AERAGRAM* 2/2). We could not intensively excavate the entire area with our limited time and resources, but we could see the outlines of the architecture and discern the basic plan by scraping about ten centimeters of deposit off of the

compacted Old Kingdom layers (see photo above). This necessitated first clearing away the thick overburden of sand and recent dumping by using front loaders.

By clearing overburden and scraping down to the walls, we plan to expose the architecture across Area A. As we go along we will be able to map walls and other features using the Giza Plateau Mapping Project grid, which David Goodman, our surveyor, established over the entire Giza Plateau between 1984 and 1991.

If we are as successful as we were in TBLF at finding the walls of the ancient

buildings, we should be able to tell what lies below. From previous seasons we have an idea about the ground plans of bakeries, workers' houses, and long galleries for production. In a workers' town we would see repeated modular plans of small houses. A royal residence, on the other hand, might be indicated by niched gates, walls with bastions, broad courtyards, and stone column bases, as seen in the plan of Amenhotep's palace at Malkata on page 1.

Vast Challenges Lie Ahead

In theory our Millennium Project is simple. But in reality we face a gargantuan task clouded by a host of uncertainties. Capturing the site's footprint with broad horizontal exposures will be a massive undertaking, like nothing we have ever done before. We are hoping to reveal, in two years, the architecture across an immense area, the vast bulk of which has never been excavated.

Vast Rewards Could Lie Ahead

To the extent that we can even approximately achieve the goals of this project, the results will be truly dramatic. Whether or not a palace lies under Area A, simply bringing to light the 4,600 year-old complex that is buried here, even in its broad outlines, will be of enormous importance.

Mark Lehner

On the Web See the Giza Plateau on these three web sites:

- * AERA web site
Reports on field seasons, back issues of *AERAGRAM*, quick time movie
www.fas.harvard.edu/~aera/index.htm
- * Oriental Institute, University of Chicago
Web page on the Giza Plateau Mapping Project
www-oi.uchicago.edu/OI/PROJ/GIZ/Giza.htm
- * Semitic Museum, Harvard University
Web page on the "Sphinx and the Pyramids" show currently on exhibit
www.fas.harvard.edu/~semitic/semitic-exhibit5.html

Lurie Foundation Grant and Challenge: Funding our Millennium Project

THE Ann and Robert H. Lurie Family Foundation has been a major supporter of the Giza Plateau Mapping Project's 1997, 1998, and 1999 seasons. This year, the Foundation launched our Millennium Project with a pledge of support that is contingent upon the commitment of other supporters. The Foundation has indicated a willingness to provide ongoing funding to subsequent field seasons with the condition that we raise funds from other donors.

When Ann Lurie visited Egypt in February 1999 with Bruce Ludwig and Tom Hill, I guided her party over Area A, our excavation site. Unfortunately, her visit fell after the close of the 1998 season when all the excavation squares were filled and reburied. I was unable to show her the walls, copper shops, ancient bakeries, or any of the other discoveries that her

generous support had funded. The only visible sites were the rolling overburden and piles of re-deposited sand and modern debris that we remove and backfill each season.

During her visit, Ann wondered how we could determine the layout of the immense architectural complex below this overburden. Like the blind man and the elephant, we see only small parts in the confines of our 5 X 5-, 10 X 10-, and 20 X 20-meter excavation squares. Subsequently, Ann challenged us to undertake a major initiative for the turn of the millennium—a marathon field season to uncover the footprint of the royal complex, and ultimately to discover the purpose of this site. Our Millennium Project (see cover story) was developed in response to Ann's challenge, and we are grateful for her encouragement.

Ann is encouraging our work and is willing to support it because she recognizes the importance of our project. Egypt during the Old Kingdom was at a threshold of development, moving from an informal, small-scale village society, to a complex, bureaucratic "state." Up to that time, such a society had never existed except for the recently emerging states in only a few other areas of the world, such as

Mesopotamia. By discovering some of the factors involved in Egypt's transformation with our studies of infrastructure, we may shed light on the development of other societies as well and contribute new understanding to this major turning point in human evolution.

Mark Lehner

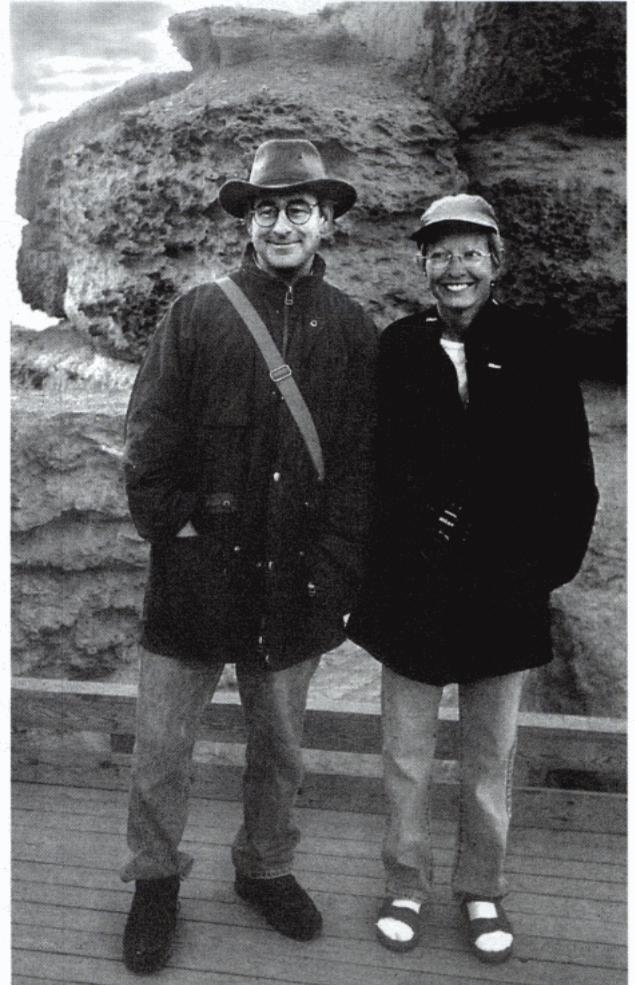


Photo by Tom Hill

Ann Lurie, during her visit to Giza in February 1999, poses with Mark Lehner in front of the Sphinx.

Help Support Our Millennium Project !

Help us meet the Lurie Foundation challenge. The Lurie Family Foundation will continue to provide funding for our project if we can find other donors.

Contributions of any size are welcome. If you would like to contribute or make inquiries please write to us at:

ANCIENT EGYPT RESEARCH ASSOCIATES
PO Box 382608
Cambridge, MA 02238-2608

Contributions are fully tax deductible. AERA is a 501 (c) (3), tax-exempt, non-profit organization.

The Ann and Robert H. Lurie Family Foundation

ANN LURIE'S late husband, Bob, began his highly successful career as a financier and nationally known real estate investor during his undergraduate years at the University of Michigan. When he died of cancer in 1990 at the age of 48, he and long-time business partner Samuel Zell owned apartment complexes, office buildings and shopping centers throughout the country. Bob, a passionate sports fan, was also part owner of both the Chicago Bulls and Chicago White Sox.

Since her husband's death, Ann Lurie has devoted herself to their six children and to the benevolent goals she and Bob established. Chief among their goals is cancer research, treatment, and education. In 1992, their foundation established the Robert H. Lurie Comprehensive Cancer Center of Northwestern University, known nationally for ground-breaking research in cancer prevention and patient care.

The foundation has also generously supported Mr. Lurie's *alma mater*, the University of Michigan, with funding for the Robert H. Lurie Engineering Center and the Ann and Robert H. Lurie Tower, a sixty bell musical carillon, the center piece

of North Campus. At the School of Social Work Ann recently endowed a chair in Children and the Families, named the Marion Elizabeth Blue Chair in honor of her mother. And at the Business School she recently established, with Sam Zell, the Samuel Zell and Robert H. Lurie Institute for Entrepreneurial Studies.

Ann and the Foundation also provided the resources to establish Gilda's Club, a support center for people with cancer, in Chicago. In addition, the foundation supports several organizations which provide food, shelter, and job training to those in need, and focuses heavily on child welfare and children's health issues.

Ann's philosophy of philanthropy "has been influenced by the writings of Peter Drucker (author of more than two dozen books on business management). One of his ideas is that rather than create something new, it is more prudent to identify an entity that does something well and help them do it even better."

We are honored that Ann may have seen our project as such an entity, and we hope we can live up to the trust that she and all our supporters have shown in our work. △

The Complete Pyramids recognized by the SAA

AT its annual meetings in March, the Society for American Archaeology awarded Mark Lehner the SAA Book Award for his *Complete Pyramids*, published in 1997 by Thames and Hudson.

The award is given each year to the author of a "book, published within the preceding three years, that has had or is expected to have a major impact on the direction and character of archaeological research." Mark's book was recognized for its "outstanding contributions to the public understanding of archaeology."

In the award proclamation the SAA noted that, *The Complete Pyramids*,

is a beautifully produced and illustrated book about the Egyptian pyramids, their origins, their symbolism, and the whole Egyptian mortuary complex. It also includes a history of archaeological exploration. It is breathtaking in its scope and coverage with hundreds of drawings, maps and illustrations, more than 80 in color.

Mark's book was one of two receiving awards from the SAA this year.

AERAGRAM

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AERAGRAM is published by AERA, the Ancient Egypt Research Associates. It reports on ongoing research and other developments on the Giza Plateau for friends and supporters of AERA and others interested in ancient Egypt.

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AERA is a 501 (c) (3), tax-exempt, non-profit organization dedicated to research on ancient Egypt at the Giza Plateau, and to making the results of those studies available to as wide an audience as possible.

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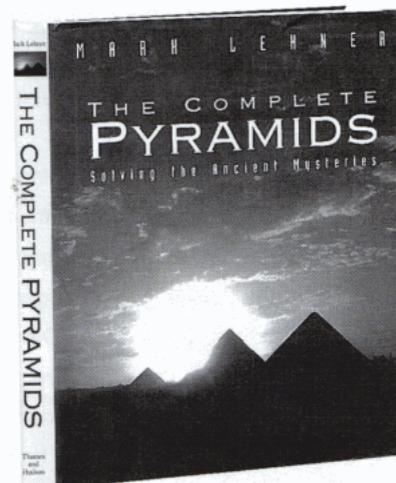
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AERA Board Member Profile: Bruce Ludwig

The logical choice to begin a series of profiles of AERA's board members and supporters is Bruce Ludwig. He was our first supporter and has been our friend and "development officer" for nearly fifteen years.

WHEN I first met Bruce Ludwig I was working at the base of the Khafre Pyramid in 1985, mapping holes about the size of dinner plates cut into the limestone floor at regular spacing. Wearing jeans and cowboy boots, Bruce strode toward me across the broad terrace. He had just come, he said, from the Valley of the Kings in Luxor where he was helping Kent Weeks, Egyptologist, on the Theban Mapping Project. (This was long before anyone knew that KV5, the "Tomb of Ramses's Sons," was anything more than an ancient rumor connected with a street-side hole in the ground.)

What was I doing? Bruce asked. I explained that these holes might be sockets for the stakes of ancient surveyors. If so, they are vital clues to the techniques of laying out the base of a giant pyramid so accurately square and perfectly oriented to true north. On the other hand, they might merely be the sockets for the scaffolding of the masons who did the final dressing on the pyramid. In any case, I told Bruce, they had never been properly mapped.

At the time the Giza Plateau Mapping Project consisted of just me, my old friend and assistant, Abd al-Qader, and tapes, trowels, an old theodolite, and a banged-up Craftsman tool chest. Our surveyor David Goodman had already joined the Giza mapping effort by this time but was no longer in the field with us. Earlier he had brought state-of-the-art surveying instruments and designed a survey control

network of "second order" accuracy. We had already marked and measured many of the points of this network that still serves us to this day. But when David left, he took the equipment, and I was back to my older gear.

Although David has always worked *pro bono*, funds for my simple budget were low, while my goals remained ambitious—a data base and computer model of the whole plateau, and long-term excavations of the workers' settlement and infrastructure that supported the thousands of people needed to build the pyramids. No sooner had I stated these goals, than Bruce immediately wrote a check for two thousand dollars "just to tide me over."

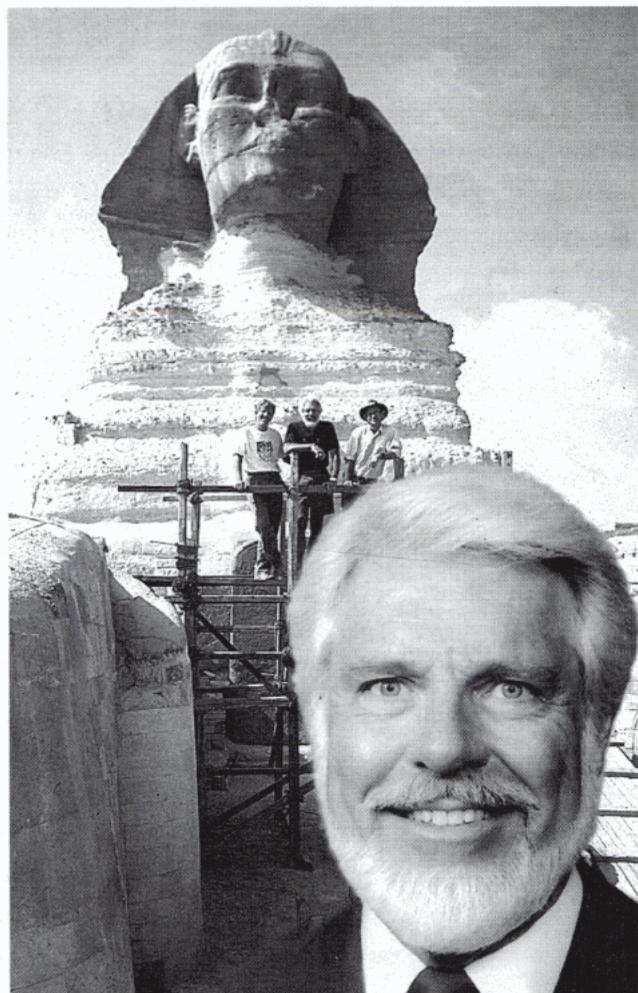
The summer months that followed saw me in Los Angeles as the guest of Bruce and Carolyn Ludwig in their home. Typically, Bruce considered inter-and cross-continental jet lag irrelevant. (If he has ever even felt the drag of jet lag he has never shown it.) That first morning after I arrived he woke me up before 6 AM. Ignoring my pleas for coffee, he loaded me, armed with a tray of slides, into his car and headed straight for the Jerde Partnership, Inc., the architectural firm of my now good friend and AERA board member, Jon Jerde.

Jon seemed especially attuned as I spoke of pyramids, alignments, and the ancient Egyptian concept of *netjer* (divinity)

and nature. Jon and I owe a long and stimulating friendship to Bruce, who had me speak to two other firms that brilliant LA morning before he finally treated me to a cup of coffee and an omelet.

Since our first encounter in 1985 Bruce has never let up as an unofficial development officer for the Giza Plateau Mapping Project and AERA. Over the years, as his support for our work has grown, he has enthusiastically recruited many other contributors. It is safe to say that Bruce has been the direct or indirect connection for most of the funding for our fieldwork.

Bruce is a natural as a "development officer" with his incredible energy and his relentless networking. Every day of his life, Bruce is connecting people to people, and



In the foreground of this photo montage Bruce Ludwig, international real estate consultant, stands in front of the Sphinx. In the background photo he poses on scaffolding between Tom Hill (left) and Mark Lehner.

Bruce Ludwig

Continued from previous page 13

worthwhile projects to resources that make them possible. He shines especially bright among what George Bush senior called the "thousand points of light" of private funding.

Mark Lehner

Bruce Ludwig: The Making of a Philanthropist

As a commercial real estate investor, Bruce Ludwig has spent much of his life supporting massive building projects all over the US. Now, after having sold his firm several years ago, he is an international real estate consultant specializing in the Middle East. The Giza Plateau Mapping Project and a host of other scientific and exploration work that Bruce supports are far removed from the world of real estate. But they are of immense interest and importance to Bruce Ludwig, former Eagle Scout, former treasure hunter, member of the Explorers' Club in the US and Royal Geographical Society in London, and member and past Trustee of the American Research Center in Egypt. The many projects that Bruce supports will be his legacy.

Growing up in South Dakota, Bruce became interested in exploration as an Eagle Scout. When his father retired from a grocery business, Bruce moved with his family to Los Angeles. Later he attended California State University, majoring in business while maintaining a keen interest in exploration and history. After graduation, he began working for a large commercial real estate firm, eventually establishing his own very successful company.

An encounter in 1980 with Kent Weeks, then Professor of Egyptology at the University of California, Berkeley, launched Bruce's career as a philanthropist. Sitting next to Weeks at a luncheon, Bruce heard of the archaeologist's plan to produce a three-dimensional map of the

Valley of the Kings in Luxor. The project sparked Bruce's imagination and he put up the funding for six weeks of fieldwork. Nearly twenty years later he still is a major supporter and fund raiser for the Theban Mapping Project.

In the meantime, Bruce has gone on to serve as advisor and patron to a prodigious and diverse array of projects. Bruce's mission is to free up scientists from much of the fund-raising burden and allow them to do science.

Bruce not only enthusiastically supports projects but believes, "everyone can and should do this. All you have to do is find a scientist in a field that interests you—medicine, space, the oceans, whatever—and believe in their work. Then be prepared to see people cross the street to avoid making eye contact with you, for fear you will ask them for money!"

Bruce has given much to recording and saving Africa's cultural and natural resources, from rock art, to elephants, to traditional ceremonies, in addition to archaeological remains. He is on the

advisory board of the Trust for African Rock Art and the African Elephant Conservation Trust. He supports the African Ceremonies Project which documents traditional ceremonies and rites of passage and is on the board of the Institute of Human Origins, which studies the fossil record of our human ancestors. Bruce is also a trustee of the American University in Cairo.

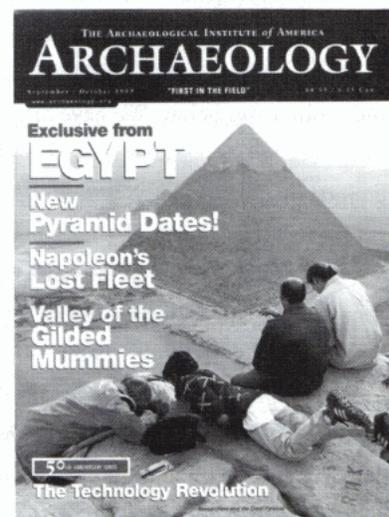
While Bruce has a passionate interest in Africa, spending several months of the year there, and even maintaining a home outside Nairobi, his philanthropy extends beyond this very large continent. He is now the only non-Jordanian serving on the board of the National Trust for Petra, a major archaeological site in Jordan. Bruce also supports the Coral Reef Foundation whose oceanographers are trying to revive the world's dying coral reefs.

Bruce now devotes about 50% of his time to scientific and cultural projects. There are no stock options, commissions, or retainers, but Bruce Ludwig says there is a greater reward: "It feeds your soul." △

Read about our Pyramids Radiocarbon Dating Project in *Archaeology* Magazine

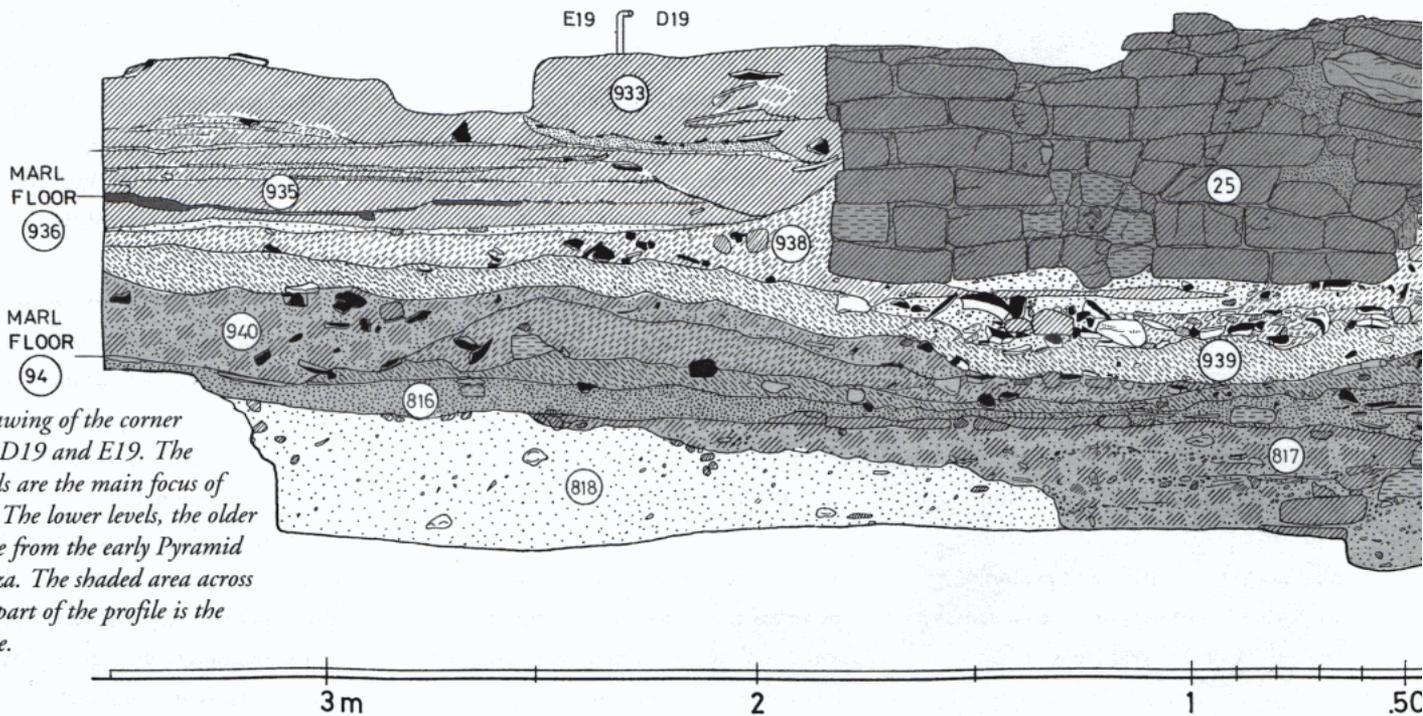
THE cover story in the current issue of *Archaeology* (September/October 1999), published by the Archaeological Institute of America, is "Dating the Pyramids." The article was written by the members of the David H. Koch Pyramids Radiocarbon Project: Zahi Hawass, Shawki Nakhla, George Bonani, Willy Wölfl, Herbert Haas, Mark Lehner, Robert Wenke, John Nolan, and Wilma Wetterstrom.

We are now preparing a monograph on the radiocarbon dating project, including all the dates, to be published soon.



← North

South →



Profile drawing of the corner of squares D19 and E19. The upper levels are the main focus of our work. The lower levels, the older phase, date from the early Pyramid Age at Giza. The shaded area across the lower part of the profile is the older phase.

The Older Phase: A Glimpse of the Early Pyra

WE are preparing for marathon field seasons in order to “capture,” or map, the overall ground plan of the ancient architecture that we have been excavating since 1988. We think this dates to the reign of Menkaure, builder of the Third Giza Pyramid, based on the mud seal impressions, most of which bear Menkaure’s name, as well as on the pottery styles, found in our excavation squares.

But we know that material from an older phase lies below. We have seen traces of it in the deep trenches that a backhoe gouged in 1991 (see map on the right and profile drawing above). We have not had an opportunity to explore this older phase, except to peer at it through these jagged windows of the backhoe bites.

We tried to get a clearer view in 1997 by cutting back the end of one of the trenches and straightening the rough, irregular sides. We cut two vertical surfaces at right

angles along our grid lines and adjacent to the bakeries.

On the final day of the excavation I mapped the profile of this corner, frantically working to finish the drawing just ahead of a front loader burying our site under a protective layer of sand (see *AERAGRAM* 1/2). The drawing above is the final product of those efforts.

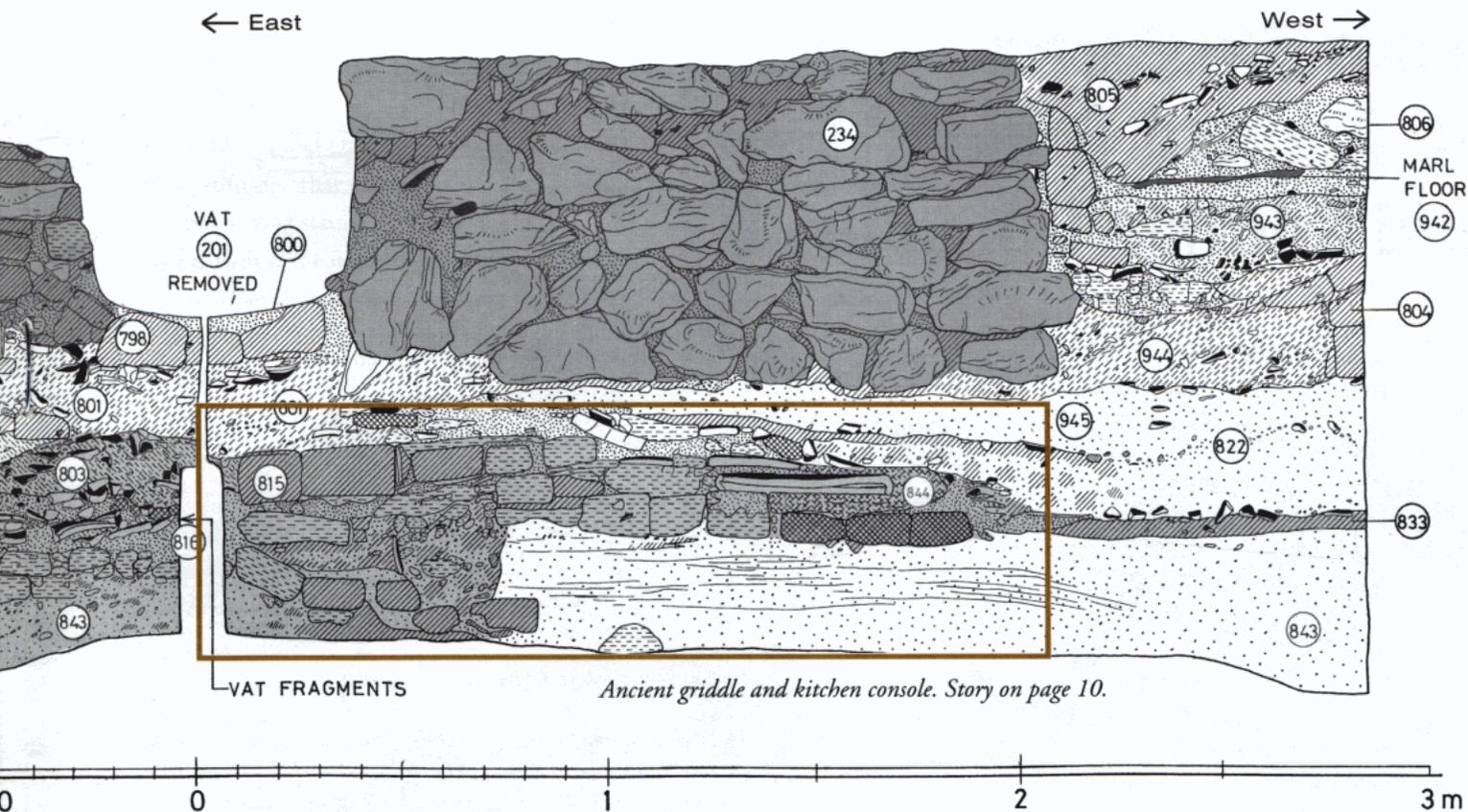
This profile, as such a section cut is called, slices vertically through our site, laying bare its history. Located at the southeast corner of squares D19 and E19, it reveals a complex of undulating and interfingering layers, with the major phase that we have been studying occupying the upper layers. The complexities of the drawing illustrate the challenges of interpreting the site’s past.

We are looking into a corner, as shown in the map on the right. The left side of the drawing is the north-south wall

of the trench, and the right is the east-west wall. The trench cut right through architecture from one of the bakeries that we excavated in 1991. On the left is Wall 25, made of mud bricks. This is the main east-west wall that we were tracing to the west in our 1997 squares. It forms the north wall of the bakery. The massive stone wall, 234, on the right, was the west wall of the bakery, forming as well a kind of counter-top where I believe they laid out their equipment and hot loaves.

On either side of the walls is mud brick tumble and decay (features 933 and 805), the debris from demolishing, or “putting to bed,” the site. Just below on either side of the walls is a thin shaded band (features 936, left, and 942, right), the remains of a marl (desert clay) floor, the floor surface used by the bakers.

The large gap between the two walls is a hole left from a baking vat (feature 201)



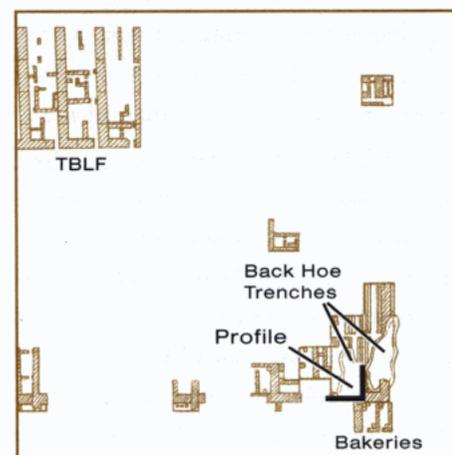
Amid Age at Giza

which we removed in 1991. The backhoe just nicked the northwest corner of the bakeries, barely missing one of three large dough-mixing vats in that corner. The gap in the middle of the lower part of the profile is a balk which was left in place.

Below our bakery there is an older cooking or baking installation, but it was apparently nowhere near so organized nor as massive as our bakeries. It is separated from the main phase by a thin layer of sand (feature 945 on the right). Just below the location of the complete vats that we removed from the bakery, there was a concentration of pottery, including fragments of older vats (feature 816) in the section. Under the vat area, extending underneath our stone wall, lie the remains of a mud brick wall or fireplace. There were traces of a marl floor on the left (feature 941) and an alluvial (black Nile valley) clay floor on the right (feature 833).

Built into the floor, right under the stone wall (feature 234) of the later phase bakery, was a cooking installation made of mud bricks (feature 815) framing an irregular mass of marl clay (feature 844) (see story on page 10). This was stained grey from ash or fired hard from intense heat. A thick pottery platter, half a meter in diameter, was set into this mass, with its rim turned upside down. Its upward surface was coated with dark ash and it had a peculiar greasy texture—this was apparently an ancient grill!

We were able to excavate about one meter of the older phase floor around this cooking feature where it stuck out at the bottom of the backhoe bite. We found two large pottery jars standing upright in front of the “grill” (see next page). A layer of fine ash (feature 816), like the “black velvet” that filled the bakeries, spread out north of the cooking place. Underneath



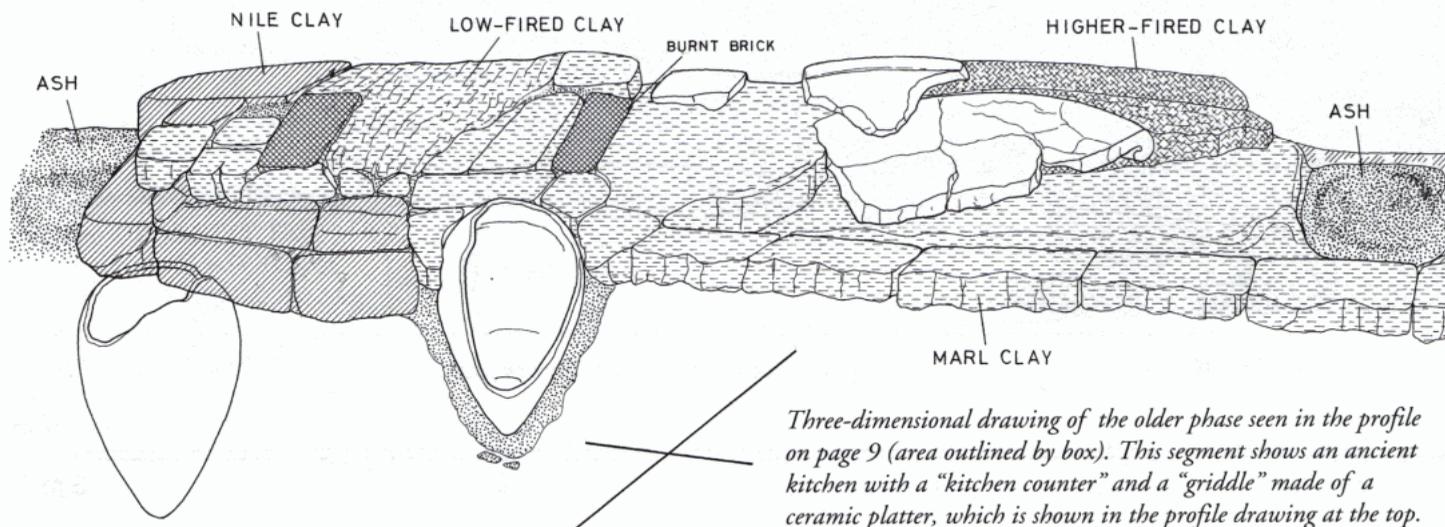
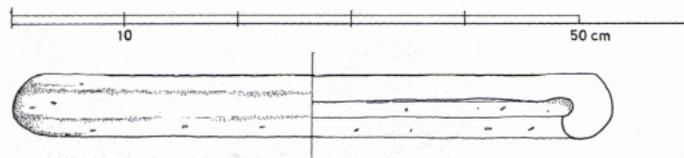
A portion of our Area A map shows the location of the north-south and east-west walls of the profile, above.

this older phase was clean desert sand (features 843, right, and 818, left), remnants of the original desert surface prior to human activity.

We studied another section of the backhoe bites in 1991 and 1995. This is

Continued on page 11

From the Earth: An Ancient Griddle and Kitchen Console



IN our excavations at Giza we are finding the elementary structures of everyday life—bakeries, kitchens, workshops, storage rooms etc.—that fed and supplied the crews who built the gigantic stone pyramids, tombs, temples, and the Great Sphinx. In contrast to those polished, otherworldly stone monuments, the everyday life structures of the pyramid builders are made of mere dirt. Like traditional cultures everywhere, the 4th dynasty Egyptians lived with dirt and the natural soil much more than modern urban dwellers.

They not only made their buildings of daily life out of mud bricks, but they literally molded their versions of kitchen counters, ovens, tabletops, and cutting boards from dirt. Bread was baked in large pots set into open pits with a dirt bottom molded into egg-carton-shaped sockets. Meats, fish, and other foods were roasted, grilled, or boiled in mud fireplaces lined

with mud brick, or on stone-paved platforms, or simply in a shallow depression in the corner of a room guarded only by a raised and rounded rim molded in the plastered dirt floor.

An example of a 4th Dynasty kitchen, shown in the perspective drawing above, was discovered in the small strip of the older occupation phase that we salvaged at the bottom of a backhoe trench (see section drawing and article on pages 8–9).

On the east (left) there was a fireplace lined with Nile mud bricks. Filled with ash and fragments of vats, it disappeared into the section on the east. The fireplace was built over a fine marl-ware jar (left), the top of which had been broken before being covered by the fireplace and griddle. In front of the griddle there was another jar which was set into an ash-lined socket in the ground. It was made of Nile clay (see side bar), which turns red when it is fired, and was used at the same time as the

fireplace and griddle. The jar had been sheared nearly in half—probably when the backhoe blade ripped through the site.

Around the griddle there was a kind of counter top, a flat platform of two levels paved with marl clay. The griddle itself consisted of marl clay that had been burnt to a dark brown and black with a crumbly consistency. A platter (profile above), about half a meter in diameter before it was broken by the backhoe, was set into this burnt clay with its rim turned "upside down." It was made of very rough Nile clay and was covered with black ash of a slightly greasy texture. If we found a fragment of this platter among other sherds in another context, we would classify it as a tray. If it was intended as a tray, here it was used as a hearth platform, perhaps a griddle ("a flat surface or pan on which food is cooked by dry heat").

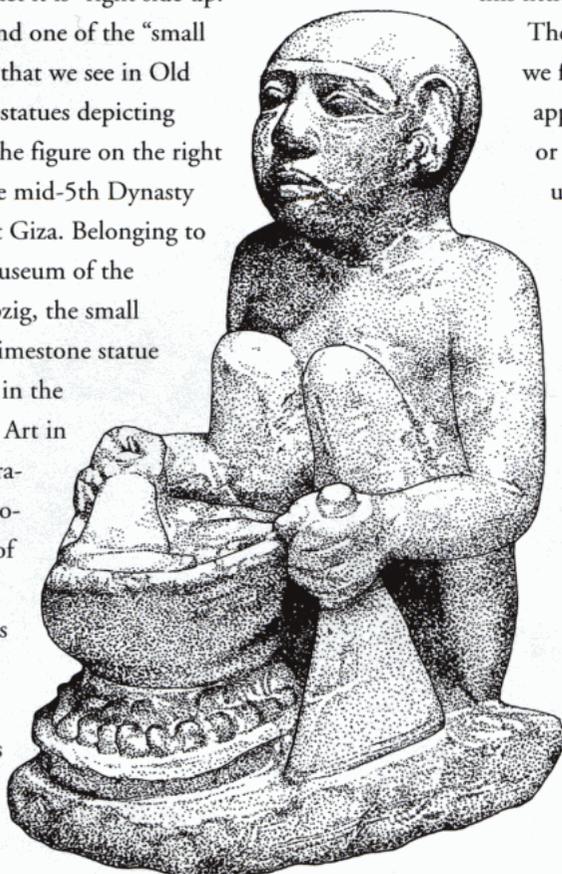
It is also possible that this type of ceramic vessel was made for just this

From the Earth

Continued from previous page

purpose, that in fact it is “right side up.” We may have found one of the “small round platforms” that we see in Old Kingdom serving statues depicting cooking, such as the figure on the right of a cook from the mid-5th Dynasty tomb of Djasha at Giza. Belonging to the Ägyptische Museum of the University of Leipzig, the small (28.8 X 14.8 cm) limestone statue is now on display in the exhibit “Egyptian Art in the Age of the Pyramids” at the Metropolitan Museum of Art in New York.

The cook squats close to ground level and stirs, or grabs the contents of a cooking bowl that sits upon hot coals resting on the round platform.



Figurine of a cook. The “cooking platform” under the pot is very similar to the “griddle” (shown on the left) in our older phase (see pages 8 and 9).

We may have salvaged from the modern backhoe the archaeological counterpart to this little figurine.

The round platform we found was apparently repaired or renewed during its useful life. The ancient cooks added more marl clay to it and another platter of which only a triangular fragment remained where it had been set above the first platter.

To the west (right) there was a shallow depression filled with fine black

ash. This was either another hearth or simply a place to dispose of fine ash like the ash left over in our barbecue grills. Like our barbecues, these ancient cooking facilities probably operated with hot, glowing charcoal, rather than flaming wood fires. △

A Tale of Two Clays For Pots and Buildings

Egyptians built with two kinds of clay:

- * **Nile alluvial** – the black clay deposited over the valley floor by the annual inundation.
 - * **Marl** – the buff or tan-colored clay found in the high desert. At Giza marl occurs at the top of the escarpment along the west of our site.
- At our site marl was favored for
- * Plastering and paving walls and floors
 - * Tamping down ashy deposits
 - * Keeping chambers clean and well-maintained
 - * Constructing cooking areas and water installations

The Older Phase

Continued from page 9

located a short distance to the northeast and gives another “snapshot” of the oldest phase of the site. After we trimmed back one long side of the trench, we found at the bottom much black ash making a stark contrast with the fresh gravelly desert sand. The section cut a large fire pit, apparently the earliest use of the site. Wilma Wetterstrom, project archaeobotanist, identified a carbonized mass at the edge of the pit as fused grain, probably barley and emmer, a tuber (*Cyperus esculentus*, an ancient Egyptian food), and minute charcoal fragments that were

probably acacia, perhaps the firewood for this cook-out.

We wondered if there were more of these fire pits, that looked so irregular compared to the thick rectilinear walls and chambers of the bakeries that we excavated up above. Perhaps this was the first settlement on our site of workers assembled for building pyramids. The fact that the lower architecture is less regular and less structured may indicate the site was an impromptu camp at the time, and that it became more formal and bureaucratic over the period of the main phase.

In order to study this older period of occupation, we will need to completely

excavate through, and dismantle, the more massive architecture of the main phase. This would teach us a great deal about the main phase, as well as the earlier use of the site, such as how the walls were put together. It is very possible that the lower phase begins as early as the reign of Khufu, and that Area A was devoted to production of bread and other materials during all three generations of pyramid building at Giza. If so the main phase may have been in use already by the time of Khafre, while our many sealings of Menkaure indicate the final days of this massive complex. △

Tales from the Crypt: The 1999 Season



Photo montage of study season. In front on the left, Cordula Werschkun enters data on the lithics into her laptop computer. On the right, Carl Andrews photographs the small finds. Behind, Sayed Sallah and Morshid Khalil sort pottery.

AS 1999 dawned, another field season loomed before us, but a different kind of season. Unlike our previous campaigns, packed with long days of excavation and drawing, this year we would tackle the storeroom. For years we had packed our excavation finds into sand bags (actually, used 25 kg. flour sacks) and piled them in our tiny storeroom, always intending to take a closer look next year. But “next year” never seemed to come as we could not spare the time from our excavations. Finally, though, last winter, we took on the storeroom.

Our goal was simple: sort and weigh as much of the sand bags’ contents as possible to make room for next season’s finds, as well as carry out some preliminary analyses. As straight-forward as this sounds, the task was daunting. On my first day on site in late February, I was greeted

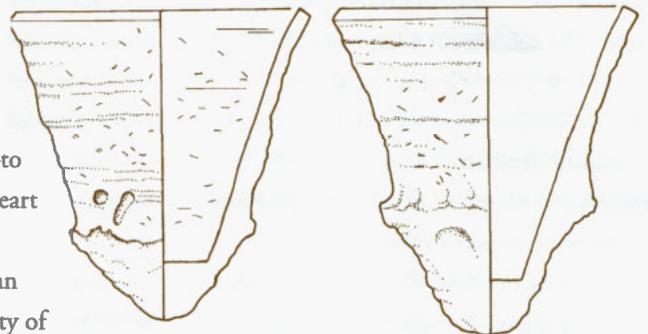
by an army of carefully labeled bags, which Mark Lehner had already sorted into categories.

Bags, Bags, Bags!

Bags of pottery made up the vast bulk of this awesome array. In addition, many more, smaller plastic bags of pottery fragments lurked inside the storeroom, in stacked crates. Out behind the storeroom there were also about a hundred or so stragglers from earlier seasons that Mark had rounded up. All told, there were over 800 bags of pottery—large and small—to deal with this season! My heart went out to Justine Way, a graduate student in Egyptian archaeology at the University of

Chicago, who would be processing all of these bags over the next month.

No smaller task awaited Cordula Werschkun, our lithics and stone tool specialist, who had just completed her Master’s Degree at the University of Tübingen in Germany. She had already processed all of our bags of flint tools and fragments from 1991 through 1995 during the 1998 field season. With the help of two



talented workmen, Sayed Sallah and Mohammed Saleh, she had washed and sorted each bag one by one, and individually labeled the often tiny flakes. She and her helpers then drew the more important objects. Afterwards, she entered the information into her computerized database and placed the flints into carefully labeled plastic boxes. Now she expected to find little more than the nine or ten half-filled crates of lithics bags from the 1997 season she had left. So I hesitated when I told her that Mark had uncovered three full—and heavy—sand bags crammed with lithics from 1998!

Long, Monotonous Days

Much of the time, Mark was in Aswan helping a WGBH public television team film another NOVA program on obelisks at Aswan. But when he was free he focused his energy on ironing out our pottery typology, detailing the wide range of sizes and shapes found in our ceramic vessels.

I would spend my time helping Justine, and examining our long neglected mud sealing collection. Late in the season, we were joined by my wife, Nina Nolan of Boston's Museum of Science, who would examine the many small bags which we had labeled "exotics." These are fragments of stone types not naturally found at Giza, and, therefore, imported into our site.

The days were long and hot, and the work was monotonous. In order to complete the tasks laid out for us, we had to remain focused and concentrate on the job at hand. Justine worked on the roof of

the storeroom with three workmen, Mohammed and Sayed, who had helped us in 1998, and Mohammed Hassan, a veteran of the 1991 and 1995 seasons. Together, these three learned the basics of our pottery sorting, which allowed Justine to concentrate her attention on sorting and accurately recording the counts and weights of the pottery.

Seven Metric Tons of Pottery!

After only a couple of days of sorting ceramics (see sidebar, next page), it became apparent that most of our pottery was composed of bread molds. Day after day, as Justine recorded the gross weights of the non-diagnostics (sherds from which the entire original vessel forms cannot be deduced) for each feature, the workmen lined up and carted off a seemingly endless train of baskets filled with the body sherds of bread molds and bread trays. Soon, the pile of discarded non-diagnostic pottery had grown into an impressive mountain.

When the season was over and the numbers were calculated, it turned out that Justine had processed just over 6,972 kilograms of pottery, of which 5,367 kilograms were considered non-diagnostic. Of these body sherds, 3,771 kilograms—just over 70% of the weight—were from bread molds or their "cousins," bread trays!

With this staggering quantity of pottery we had to wonder about its source. It seemed most likely that the pots were manufactured close to where they were used. Not only were they heavy and hard to transport, but the sheer bulk of

shattered fragments we recovered suggests that a steady stream of new molds and trays was in constant demand by the bakeries at our site. If this is correct, the potter's workshop must lie buried somewhere near our concession.

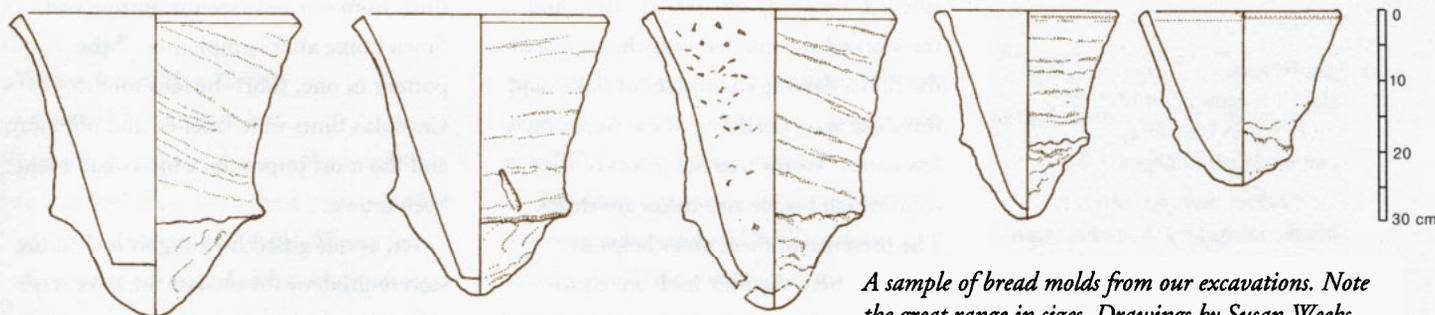
Tweaking Typology

While Justine and her team worked their way through the large pottery sacks, Mark studied our pottery forms with the diagnostic sherds stored in the small bags. Working with examples for each size and shape of vessel, he tried to refine our typology. A "typology" is simply a catalog of the main varieties of pottery present at a site (or in a region). Each vessel "type" is not only defined by its size and shape, but also by the kind of clay from which it is normally made, and how the surface is (or is not) decorated.

After years in the field, we had developed a general typology, with the help of Dr. Peter Lacovara (see *AERAGRAM* 2/1), but many problems still had to be worked out. By laying out the examples of each type of vessel and conferring with Justine and me, Mark was slowly and systematically resolving these problems, and making detailed profile drawings.

Since the phase of occupation we were working on was limited to the 4th Dynasty, it was in a sense a time capsule. If Mark could refine our typology, it would provide a rare, chronological "snapshot" of the pottery used during that period. This is what lured Dietrich Raue, ceramicist

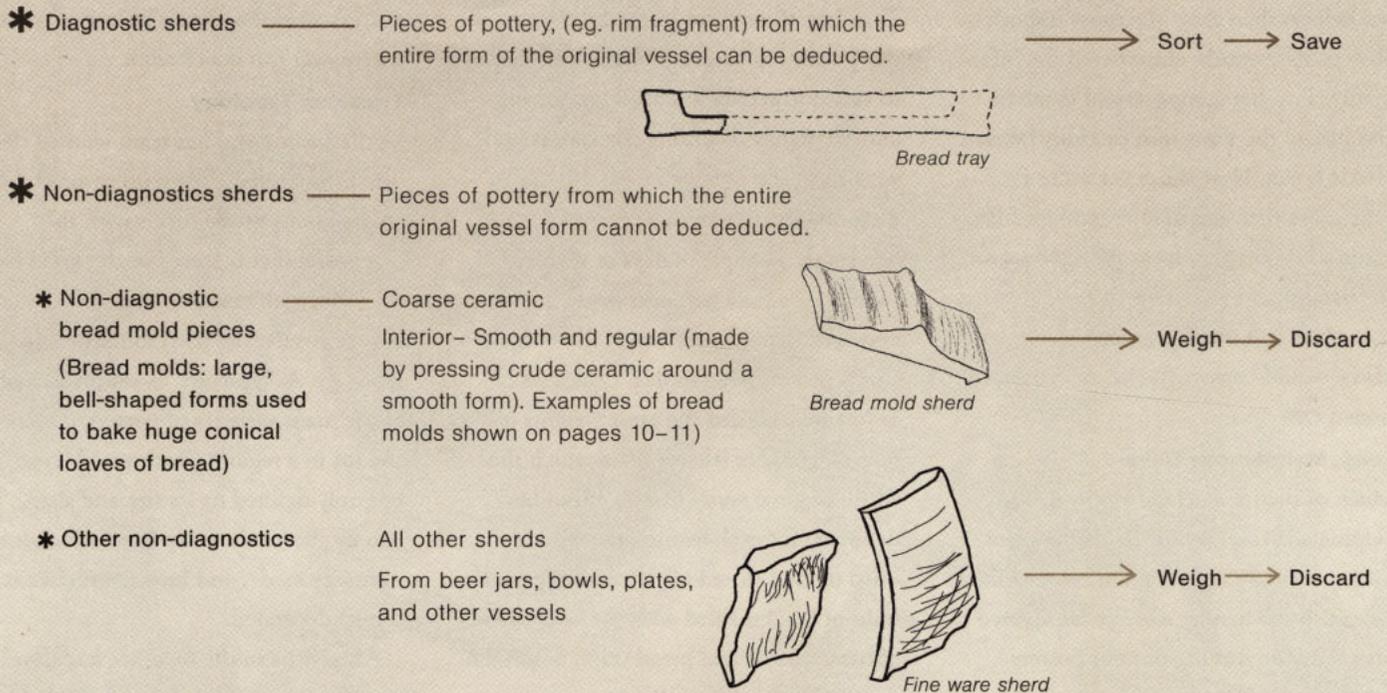
Continued on page 14



A sample of bread molds from our excavations. Note the great range in sizes. Drawings by Susan Weeks.

Sorting Pottery

Giza Ceramics are sorted into three categories:



A Tale of Two Flints From Near and Far

The flint tools from our excavations were made from two types of flint:

- * **Desert Flint** – comes from flint cobbles scattered around the nearby desert. Accounts for most of our flints.
- * **Tabular Flint** – comes from flat seams of flint, resembling table tops. Quarried from only a few known sources in Egypt:
 - * Thebes
Well-known source, but distant (ca 375 miles)
 - * Abu Roash
(site of the pyramid of Khufu's son Djedefre, 5 miles north of Giza)
Poorly documented, but if it was a real quarry, it was a more probable source for Giza flints.

Tales from the Crypt

Continued from page 13

with a German team working at the site of Elephantine, to visit us. In some of the evolutionary sequences of his pottery at Elephantine, the 4th Dynasty appeared to be a crucial period of development, especially among the fine, thin red-ware bowls. Since our pottery was restricted in time, it could provide a key linchpin in the study of Old Kingdom pottery throughout ancient Egypt.

Flint Cobbles and Quarries

Meanwhile, Cordula busily drew and labelled the newly discovered lithics and as she worked she puzzled over the source of the flints. Among the masses of flakes and flints she was classifying, there were only a few cores. "Cores" are the pieces of flint from which blades and flakes are struck. The presence of these cores helps us localize where the flint tools were produced. In addition, Cordula was interested

in the source of the flint itself (see sidebar on the left). The most common type at our site was locally available but the rarer type, tabular flint, was imported. Thebes is the best known source but distant. We heard vague reports, though, of a tabular flint quarry at Abu Roash, site of the pyramid of Khufu's son Djedefre, five miles north of Giza. If true, this is a more probable source for our tabular flint.

More Questions

As the season ended, we had achieved our initial objective. The storeroom was organized and nearly empty, ready for finds from our next season. Justine had flown home after completing all the pottery in one, short, furious month. Cordula's flints were labelled and put away, and the most important objects had even been drawn.

Yet, as our guard Es-Swaghir locked the storeroom door for the last time, we were left with new questions. Where were the

In Memoriam: Farag Hussein Saluma

In May we were saddened to learn of the sudden death of Farag Hussein Saluma, who had worked with us at Giza since January 1995.

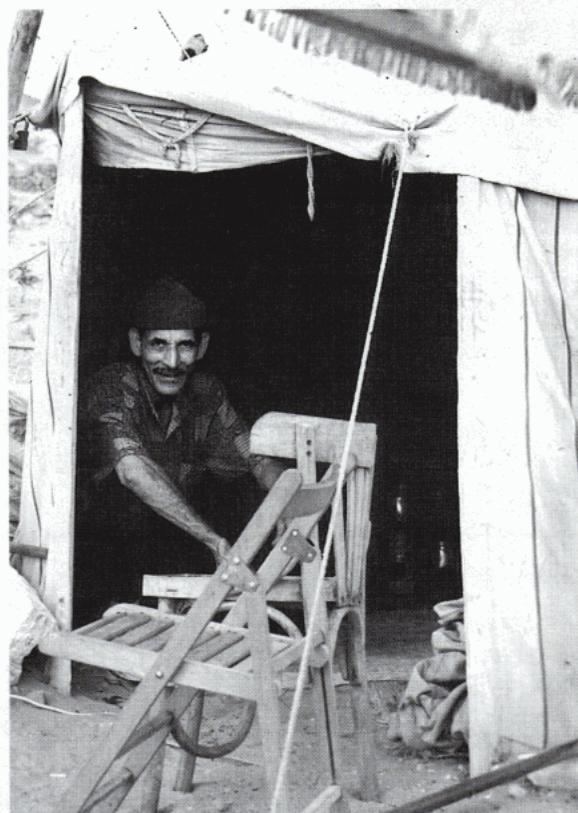
FARAG was much more than a driver for our expedition to the Giza Pyramids. We depended upon Farag for so many things, from procuring everyday necessities at the site, such as drinks and sandwiches, to arranging for the local blacksmith to custom cut and bend rebar into stakes for our survey and excavation squares. Farag was the one who kept the site guards well stocked with charcoal for heating tea water, stoking their water pipes, and keeping warm.

Each Thursday evening after a whole week of work, I would sit with Farag and do accounts for six days worth of Pepsies, bottled water, *foul* (fava beans) and *tamaia* (Egyptian *falafal*) sandwiches, charcoal, and all the other items Farag had rounded up for us. At the end of a long week, this was sometimes the last thing I wanted to be doing, but Farag's good humor kept the worst of mine in check as we ticked off items that were far beyond the call of duty for a driver.

His good humor; that is what we will miss most about Farag. On the way home from our site, as we skirted the density of Nazlet es-Semman, the urban area (once a village) at the very foot of the Pyramids

Plateau, we would hit smack into rush hour traffic just where the canal road, the main north-south street, meets Pyramids Road, the main four-lane thoroughfare across Giza. It never failed that there was as bad a traffic snarl as one could imagine at this intersection. Somehow, in ways that none of us could reconstruct in short-term memory, Farag needled his way through, using the clutch, brakes, gas peddle, steering wheel, gestures with his left arm and hand, and, of course, his voice. We will never forget the times that he would leap from the old white Peugeot to direct traffic.

For some of us, our last memory of Farag was the final trip to the airport this past field season. Farag was the choice to drive us, even if his driving was a little more "animated" and his car a little less reliable than an anonymous commercial taxi driver's. Farag was our choice because we all felt comfortable with him. It was a friend taking us through the dark hours of the night or early morning to that peculiar rite



While we worked, Farag often sat in the guard's tent on site at Area A, awaiting our next request.

of passage, flying into and out of Egypt. We had shared dinner, stories, jokes, and the entertainment of his children at his house tucked within the labyrinthine paths of Kafr Gebel village.

When we return to Giza this October, we will always think of Farag whenever we ask, "Can you find...? Can you take us to...?" He could always find whatever we needed and deliver us wherever we wanted to go. We will miss Farag.

Mark Lehner

Tales from the Crypt

Continued from previous page

pottery workshops that supplied ceramics to our site? How were these pots related to pottery elsewhere in Egypt? Where did all the granite chips and alabaster pieces we were finding come from? Were the crafts-

men at our site using scraps from the royal workshops just over the ridge? Where was the flint for our lithics worked?

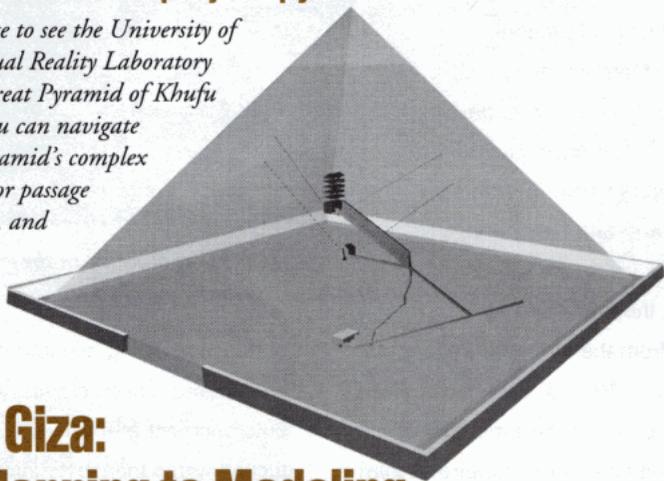
All of these questions had implications for our conception of Old Kingdom society. If all our pottery was manufactured in this area by local craftsmen, why

was it so similar to the pottery made at Elephantine, nearly 450 miles to the south? And, did the absence of flint cores at our site mean that the tools were transported to our site? Alas, our questions would have to be set aside until we had more data from future seasons at Giza.

John Nolan

www-VRL.umich.edu/project/pyramid

Try this web site to see the University of Michigan Virtual Reality Laboratory model of the Great Pyramid of Khufu shown here. You can navigate through the pyramid's complex system of interior passage ways, air shafts, and chambers.



Virtual Giza: From Mapping to Modeling

ONE of our goals has been to create a virtual Giza Plateau using the data that we have been collecting for the past two decades. The image of Khufu's pyramid above is from our first attempt at an interactive virtual reality model. Developed by Klaus-Peter Beier at the University of Michigan Virtual Reality Laboratory, the model can be "toured" on the Web.

Virtual Giza first began to take shape in 1990 when Tom Jagers, of the Jerde Partnership, created a digitized model of the Sphinx using Mark's data for a conservation proposal. Jon Jerde, an AERA board member, donated equipment, time, and staff to carry out the project.

In 1991 Peggy Sanders, of Archaeological Graphics Services, working with the Oriental Institute Computer Laboratory, began to build a three-dimensional computer model of the Giza Plateau and its architecture using our data and published material. The model, which continues to grow as data is added, was first used to create an animated "fly-over" sequence for WGBH's NOVA program "This Old Pyramid." Subsequently it has been used for publication and research, as well as for the virtual reality model.

Learn more about the Giza Computer Model and see rendered models at:
www-oi.uchicago.edu/OI/PROJ/GIZ/Giza.htm

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www.fas.harvard.edu/~aera/index.htm