THE ORIENTAL INSTITUTE
COMPUTER LABORATORY

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INTRODUCTION

During the last year the Oriental Institute Computer Laboratory received several generous donations. We appreciate all of these contributions by members and other interested parties and will use any such gifts for the benefit of the entire community of the Oriental Institute.

The Oriental Institute applied to the Women's Board of the University of Chicago for support of a computer workstation and peripheral equipment that would be used for satellite image analysis by the Institute's archaeologists and their students. We learned in December that our proposal was selected and that the Computer Laboratory would be able to acquire the necessary equipment to introduce satellite imaging into the programs of archaeological exploration. After delivery of the computer hardware we were pleased to host visiting members from the Women's Board on May 17, 1993, in order to demonstrate the system and to explain in detail how its use will benefit archaeological investigations at the Oriental Institute. We are grateful for the generous gift of the Women's Board and welcome them back at some future date for a progress report on its use.

Late in the winter the Administrative Office, along with the Development and Membership Offices, decided that the Annual Dinner to be held on May 24, 1993 would benefit the Computer Laboratory. This wonderful opportunity to showcase what the Computer Laboratory does to further scholarship in ancient Near Eastern studies was much appreciated, and judging from comments after the event, our presentation was well received. I would like to thank Dr. Sumner and the Development and Membership Offices for their efforts in providing all those who attended with a thoroughly enjoyable evening.

In the spring of 1993 Abbas Alizadeh graciously donated to the Computer Laboratory an IBM-compatible desktop computer (left to him by the estate of the late Helene Kantor). It found an immediate home, replacing the "old" and "slow" IBM AT computer that we have used for graphics production since 1986. The Computer Laboratory is putting the computer system to good use on a daily basis in the production of databases for several of the Oriental Institute's archaeological projects. Abbas, a former student of Professor Kantor, will use a second computer that was left to him to finish several of her on-going publication projects.
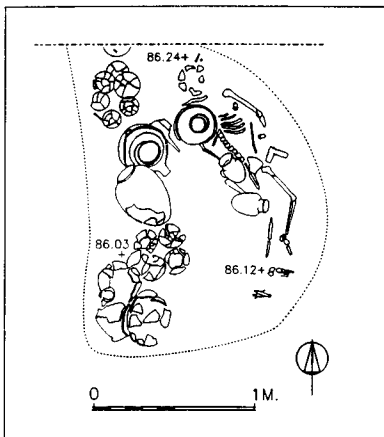
Not too long after the publication of the summer issue of the members' newsletter, *News & Notes,* Mr. Thomas Heagy, a member of the Oriental Institute Visiting Committee, called the Computer Laboratory. He had read our appeal for

the donation of used computer and video equipment (*News & Notes,* Summer 1993, no. 138, p. 14) and said he could donate a 26″ color television. After consultations with Charles Jones, it was decided that the television should become part of the new multimedia workstation that Chuck has been planning to install in the Research Archives, where it will be used to display the video portion of computer databases such as the recently acquired Perseus Project from Harvard. This donation will go a long way toward furthering the Research Archives' objective of obtaining the widest and most complete array of resources pertaining to the ancient Near East.
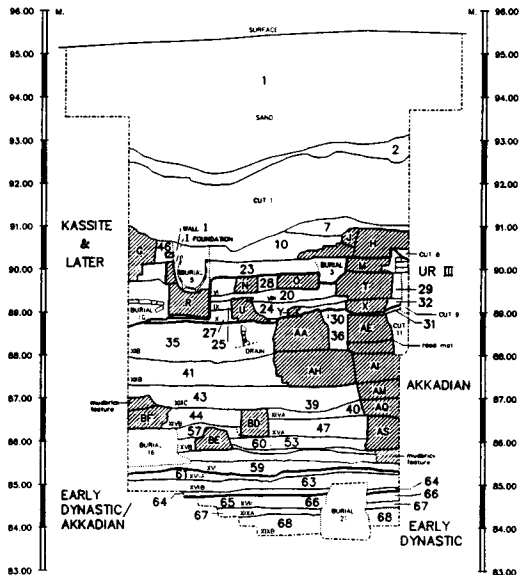
LABORATORY PROJECTS

The Nippur Expedition

For the second year in a row the interruption to excavations at Nippur has provided increased time for preparing publication maps, plans, pottery, and object drawings from several seasons of excavation at Nippur. Our efforts were concentrated in the following areas:

Area WC-1—after years of compiling, editing, and revising the architectural plans, sections, and detail drawings the final plots were printed and incorporated into the final

Computer drawing of the East Profile from the excavations in Area WF at Nippur, compiled from data collected during the 1988–89 and 1989–90 seasons

manuscript. The publication, *Nippur III: Kassite Buildings in Area WC-1*, was published in the early summer of 1993.

Area WF—final plots for the dissertation of Augusta McMahon, the supervisor of Area WF, were completed. Her dissertation will form the basis for the future publication of the complete WF excavations.

Area TC—layout and final plotting of publication plates for pottery excavated from Area TC was completed in consultation with James Armstrong. The accompanying architectural plans and sections were also revised as part of the on-going analyses of the excavation records.

Computer drawing of the plan view of Burial 14/Skeleton 1 from Area WF at Nippur, compiled from data collected during the 1988–89 and 1989–90 seasons
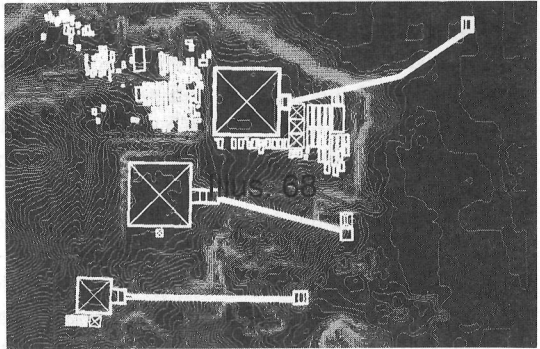
Giza Plateau Mapping Project

Work on the computer model of the Giza Plateau and its architectural monuments continues to progress at a steady pace. Peggy Sanders spent many long hours throughout the past year painstakingly constructing three-dimensional geometry for several of the temple complexes from data contained in various publications in the Research Archives. Detailed architectural models have now been completed for the following monuments:

Khufu Pyramid;

Khafre Pyramid, and its Mortuary Temple, Causeway, and Valley Temple;

Menkaure Pyramid;

Sphinx Temple.

Computer model for the Giza Plateau Mapping Project, showing a plan view with one meter contour lines and the wireframe geometry of the major architectural monuments at the Giza pyramid complex. Photograph was taken directly from the computer screen

To recreate fully the architectural features of the Sphinx Temple, the Computer Laboratory was faced with constructing as computer models twelve larger-than-life-size statues of the seated pharaoh Khafre, which were located around the periphery of the courtyard of the Sphinx Temple. Because the collection in the Oriental Institute Museum does not contain any artifacts that duplicate the posi-
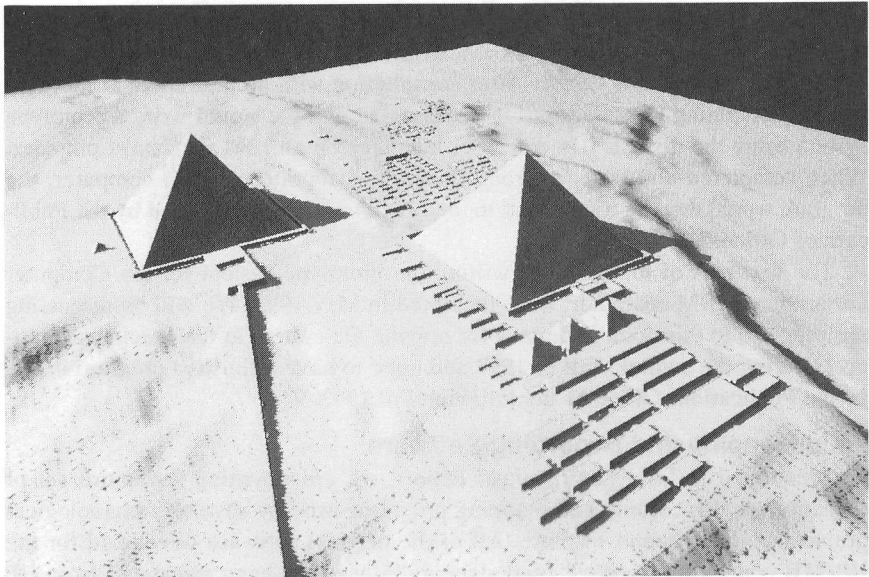
Computer model for the Giza Plateau Mapping Project, showing a rendered, aerial perspective view of the Khufu and Khafre Pyramids and associated structures and mastaba tombs. Photograph was taken directly from computer screen

tion, clothing, and crown of the required statues as envisioned by Mark Lehner, Peggy Sanders sculpted a scale model of the figure in clay. The foot high statue was then taken to the Biomedical Visualization Laboratory at the University of Illinois-Chicago, where, with the help of Director Louis Sadler and his staff, a laser scan was made of this statue, resulting in a computer data file of some 70,000 discrete data points that precisely model its surface geometry. During the fall of 1993 this data file will be processed by the Computer Laboratory's ARRIS graphics program to create a computer model of the statue, which will then be added to the overall model of the Sphinx Temple. Although a complex process, it nonetheless should result in a very detailed and realistic recreation of not only the twelve statues but the entire courtyard area within the Sphinx Temple.

Besides these monuments from the Giza Plateau, Mark Lehner also had the Computer Laboratory create similar three-dimensional models for the architectural complex at Saqqara, south of Giza, to be included in forthcoming article on the Old Kingdom by *National Geographic* magazine.

Tal-e Malyan Project

In consultation with William Sumner, work on a forthcoming site report included the drawing of lithics and their layout for publication plates, as well as the computer digitizing (tracing) of the building plans for the Proto-Elamite levels in Operation ABC.

Publications Office Accounts Receivable Database System

In the summer of 1992, the Computer Laboratory undertook its first computer software programming project, a new Accounts Receivable and Book Inventory System for the Oriental Institute's Publications Sales Office. Mr. James Willis, the Publications Office Sales Manager, compiled a list of changes to their present Macintosh system along with a number of new capabilities that would enhance the efficiency and productivity of tracking clients, sales, and inventory by the staff of the Publications Office. After consultation with programmers at the University Computing Organizations it was decided that we would write a prototype system using the dBASE III+ computer language on an IBM Personal Computer. When completed and tested thoroughly on the Laboratory's IBM computer, the program would then be transferred to the Macintosh computers used by the Publications Office.

The first part of this process, writing the prototype system for the Computer Laboratory's IBM computer, was completed in May 1993. We will be discussing our progress to this point and plans for moving the system to the Macintosh computer during the summer/fall of 1993 and hope to have a finished program in use by the Publications Office by the fall/winter of 1993–94.

Field Mapping and Recording Software

As mentioned in last year's *Annual Report*, we are rewriting the entire set of archaeological recording and mapping programs used by several archaeological projects of the Oriental Institute. All of the original software developed for the HP-71B computers we have used since 1985 has now been translated from HP Basic into the dBASE III+ computer language, a more general-purpose programming language that will allow us to operate our mapping programs on a wider

range of hand-held and/or IBM-compatible computers. During this process, several new features have also been added that will enhance the overall capabilities of the software. Testing and debugging the new versions will continue into the winter of 1993–94, at which time the software should undergo its first true test in the field as part of the Giza Plateau Mapping Project's next season of excavation.

Field Survey and Excavation Data

Two Institute archaeological expeditions, the Aqaba Project, under the direction of Donald Whitcomb, and the Bir Umm Fawakhir Project, under the direction of Carol Meyer, asked the Computer Laboratory to process their respective site survey coordinate data and to produce two-dimensional contour maps as well as three-dimensional surface terrain drawings for each site. These types of computer graphics can aid the archaeologist in attempts to understand and interpret topographic features in the landscape.

Carol Meyer also decided to computerize all of the architectural plans from the two field seasons at Bir Umm Fawakhir and to integrate these computer drawings with the overall site contour map discussed above. She received instructions in the basic operations of an IBM-compatible computer, the AutoCAD graphics program, and the process of creating three-dimensional computer models. As time permits, she uses a computer in the Computer Laboratory to enter the X, Y, Z coordinate data for the more than 100 recorded buildings, a process that will take several more months to complete.

LABORATORY EQUIPMENT/RESOURCES

The installation of the computer network in all offices and classrooms of the Oriental Institute has made possible the sharing of computer resources in a very efficient and cost-effective manner. To encourage and facilitate sharing of electronic resources throughout the building, the Computer Laboratory, with generous contributions from Charles Jones and the Research Archives, has established the Institute's first dedicated file server. A file server is a computer that stores single copies of computer files in one location, which can be accessed, edited, and printed by multiple users from their office computers. Residing in the Computer Laboratory, Room 232, the file server is a Macintosh IIcx computer with a 520 megabyte hard disk (one megabyte equals 1,024,000 characters of information). Data files stored on this computer are accessible to all faculty, staff, and students in the Oriental Institute via the building's computer network.

The first resource placed on the file server was the On-Line Catalog of the Research Archives. With only this single copy of the On-Line Catalog residing on the file server, faculty, staff, and students who access the catalog are using the same version that is edited and revised by the Research Archives staff on a daily basis. Results of catalog queries, therefore, are as up-to-date as possible.

In the near future the Publications Office Accounts Receivable and Inventory databases will also be placed on the file server, as well as the Conservation Laboratory database of museum artifacts that have been evaluated for conservation and/or received treatment. As was the case with the On-Line Catalog, since these databases need to be accessed daily by more than a single individual, storing these files on the file server will better facilitate their use by appropriate staff members.

As the year came to an end, discussions began with the University Computing Organizations regarding the establishment of an electronic discussion group over the worldwide Internet computing network that would focus on topics related to the ancient Near East. The system, which would operate on a Sun SPARCstation computer in the Oriental Institute, would use a public domain software program entitled Majordomo to administer a series of mailing lists. A "mailing list" program uses standard electronic mail to redistribute information among its subscribers. The system will be up and running in the late summer of 1993 and will be reported on more fully in the *1993–94 Annual Report.*