

DIYALA OBJECTS PUBLICATION PROJECT

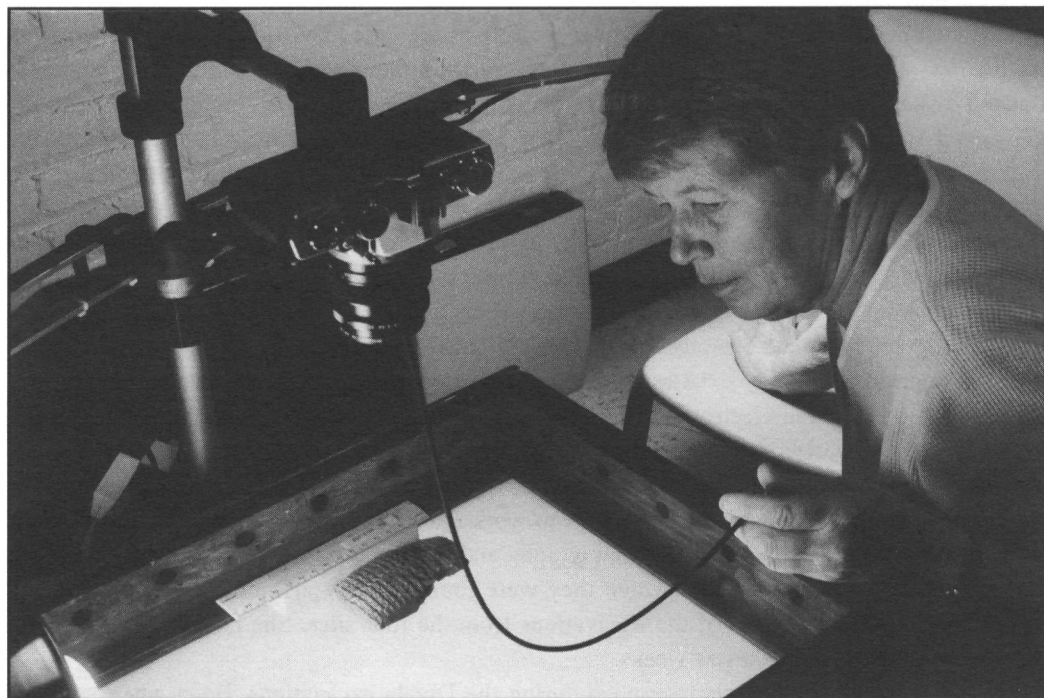
McGuire Gibson

The past year has been a very productive one for the Diyala Objects Publication Project. A grant from the Provost's Academic Technology Innovation Program allowed us not only to continue the work begun on a three year National Endowment for the Humanities (NEH) grant, but also to expand our activities considerably.

The purpose of this project is to make available to the scholarly world the 12,000 "miscellaneous" objects that were found during the Oriental Institute's excavations at four sites — Agrab, Asmar, Ishchali, and Khafaje — in the Diyala region of central Iraq between 1930 and 1937. The Diyala excavations were, for their day, a model of excavation, recording, and publishing, and the nine volumes that were produced have remained basic for Mesopotamian archaeology and art. But the very important body of material termed "Miscellaneous Objects" was never finished.

The term "miscellaneous" does not do credit to some categories of objects, such as baked clay plaques, jewelry, and metal objects, which show excellence in artistry or craft. But it is not just the "beautiful" objects that are of interest, since the most mundane kinds of items can give important information on daily life or sacred ritual.

From the beginning of this project, in the mid-1990s, we have been incorporating computer technology, and as that technology changes, we are altering our ideas of what "publishing" means. Increasingly, we are seeing the advantages of electronic presentation. All the data have been entered into a set of relational databases that can be sorted and queried many ways. Thus, for example, we can ask for specific lists of all stone objects, or all metal bowls but not plates, or all metal bowls from Tell Asmar but not from the other three sites in the Diyala. In the future,



Volunteer Betsy Kremers takes picture of one of the cuneiform tablets from Tell Asmar stored in basement of Oriental Institute. Photograph by Clemens Reichel



One of the tablets, a legal text (ca. 1930 BC) with impressions of two seals, found at Tell Asmar. Photograph by Betsy Kremers

the database users will be able to ask questions that we have not thought of. Along with descriptions, measurements, and other textual data, we have also entered all existing photographs and drawings of these objects by scanning, and we have linked these illustrations to the databases so that one can see what is being described. Putting a corpus of materials of this size on the Internet would be a milestone in web publication for the ancient Near East and it would further the use of the Internet as a primary research tool. We are still thinking of keeping an option

open for those who want to hold a book rather than click a mouse and will probably produce paper versions of some parts of the data on demand.

The size of the database, especially with the photographs, was beyond the capacity of the computers we began with in 1995. Thanks to the grant from the Provost's office we were able to buy a new PowerMac G3 and two external hard drives that have now increased our storage capacities to ca. 40 gigabytes. That's a lot of memory and we can now access all the data quickly. But that capability will not last indefinitely. A rapidly increasing number of images will eventually present us once again with problems of manipulating data. We are aware of great advances in memory just over the horizon and we assume that a new set of computers will be available to solve the problems.

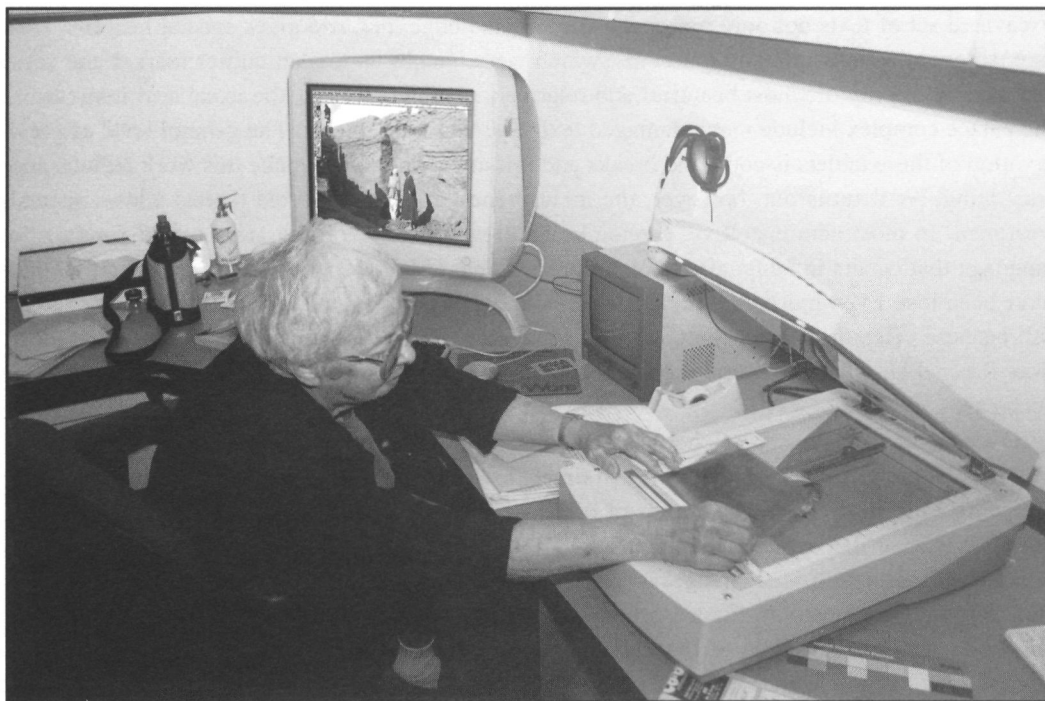
Last summer Clemens Reichel took over the role as the coordinator of the project, supervising the data entry, the work of volunteers, computer programming, and digital imaging. He is assisted by another graduate student, Colleen Coyle, who works part time on data entry and the analysis of archaeological objects. The project would be much farther from its goal without the work of some remarkable volunteers, who have devoted much of their free time, special skills, and enthusiasm to this project. Joyce Weil has been scanning object photographs for us since 1996, initially working with a flatbed scanner and later with the large-scale negative scanner at the Digital Media Laboratory. She completed this task in August 1999, having scanned 2,150 images showing 7,500 objects. Joyce then moved on to a new challenge, the scanning of all other photographs that had been taken during the Diyala excavations. Most of these photographs were never printed and only exist as negatives in the Oriental Institute Archives. We are, thus, preserving the images in electronic form for future generations as well as for immediate use in our own project. This work is essential since it is often impossible to understand and evaluate plans and field notes without seeing an actual photograph of the excavation. The plans and photographs of the excavations make it possible to work out findspots for the objects, and it is our intention to present on-line not just photographs and drawings of the objects but also photographs and plans of the places in which they were found. In the past nine months, Joyce has scanned over 1,100 negatives of the excavations from the four sites. She hopes to complete all the negatives within the next few weeks.

Not all objects had been photographed during the Diyala excavations. Even when we have the old photographs, some are too poor in quality to be of use. It was clear that we needed additional photographs of several thousand objects stored here at the Oriental Institute, leaving aside

for now the thousands of others that are in the Iraq Museum. We were more than fortunate when Betsy Kremers joined our project in 1998 as our object photographer. Between 1998 and 1999 she took some 1,230 new pictures of weights, inlays, beads, jewelry, metal pins, stamp seals, and cylinder seals, before moving on to photograph the 1,500 unpublished tablets from the excavations at Tell Asmar. Tablet photography posed a new challenge for Betsy since tablets need to be photographed with a raking light source. The angle at which the light falls onto the tablet is crucial in assuring the readability of the tablet's inscription. In addition, details such as shallow seal impressions on the tablets are very important but are also easily overlooked. The seal impressions often need a separate close-up shot with different illumination. In the last nine months, Betsy has taken almost 1,500 photographs of about 300 tablets, which subsequently have been scanned and are now available on the computer for further research. With increased ease in the routine and with improved equipment, she hopes to finish this monumental task within the next two years.

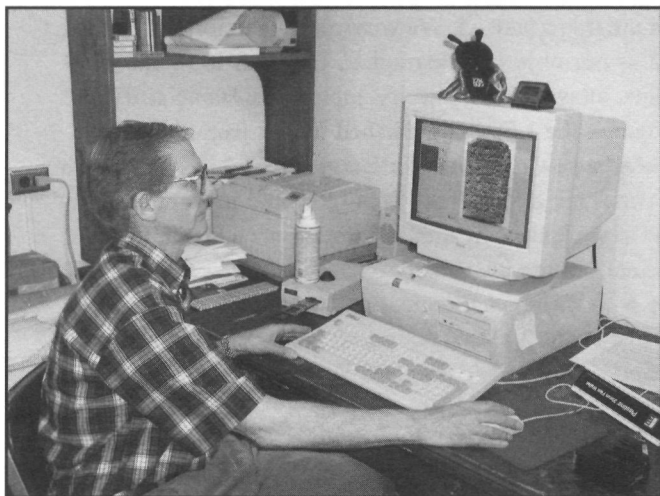
Initially about a thousand of the new photographs were scanned by Richard Harter on the 35 mm negative scanner housed in the Oriental Institute's Computer Laboratory. Richard's patience and perfectionism in carefully focusing, adjusting, and scanning these images is admirable, and none of us want to hazard a guess at how many hours he spent working for us. Although we began sending out the negatives to a professional laboratory to be scanned and burned onto CDs, we still rely heavily on Richard for detailed work on images.

Having these skilled and almost independently-working volunteers has greatly reduced the work load of the staff members. Thus, apart from digital enhancements and regular updates of computer programs, Clemens Reichel was able to devote most of his time to the analysis of sealings and tablets from Tell Asmar (Eshnunna), which are not only a critical part of the overall project, but also form the basis of his doctoral dissertation. Reichel's dissertation work has



Volunteer Joyce Weil scans large-scale negative of photograph taken during excavations at Tell Asmar in Digital Media Laboratory of the University of Chicago. Photograph by Clemens Reichel

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Volunteer Richard Harter scans negative of cuneiform tablet at 35 mm negative scanner in Oriental Institute's Computer Laboratory. Photograph by John Sanders

served as a pilot project to test first the completeness of the database and then the programs that manipulate it.

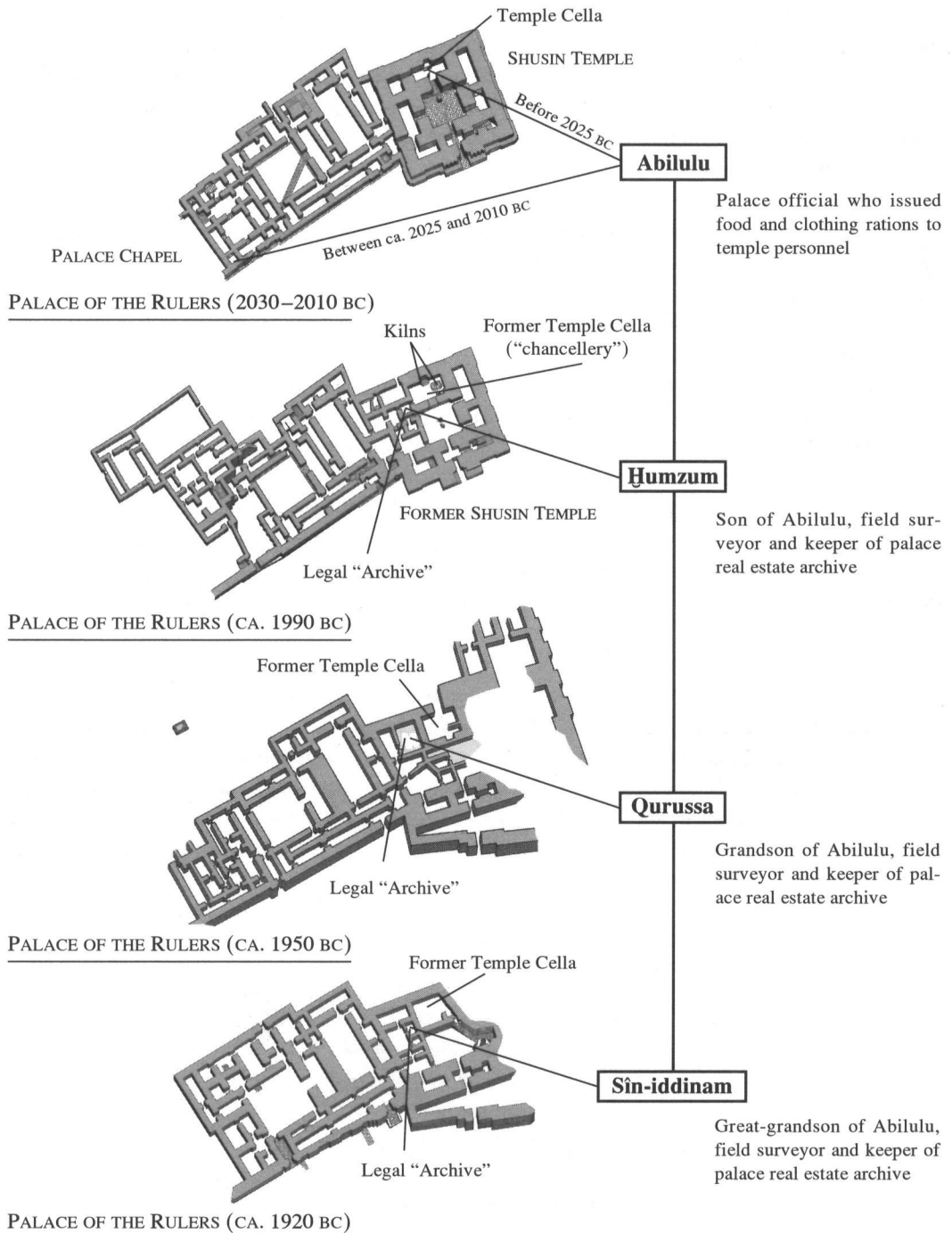
Reichel is addressing one of the most important building complexes exposed in the Diyala, the Shusin temple and the Palace of the Rulers at Eshnunna (Tell Asmar), an administrative complex that was built around 2070 BC when the area was ruled by a provincial governor under the kings of the Ur III dynasty. This palace became the seat of government after Eshnunna gained its independence from Ur around 2025 BC and stayed in use, with several major rebuildings, for more than two centuries thereafter. These years were politically turbulent, evi-

dence for which can be correlated with several architectural phases of this building complex. A temple built for the divine King Shusin of Ur around 2030 BC at the northeast side of the palace, for example, was desecrated after Eshnunna became an independent kingdom, and the former sanctuary was soon turned into a workshop.

Reichel's work attempts to link the archaeological and architectural evidence with information gained from the 1,200 cuneiform texts found in this building, thereby gaining new insights into the function of the various parts of the palace as it changed through time. Dealing with an excavated set of texts not only presents a special challenge, but also gives special benefits. Unlike tablet collections in many museums, which were bought on the antiquities market and consist usually of only the most beautiful and relatively complete tablets, the excavated items from the palace complex include many damaged texts and tablet fragments. The general level of preservation of these tablets is poor, and breaks and missing pieces often make this work tedious and frustrating. As it turns out, however, the inclusiveness of the excavated tablets allows special treatment. In most administrative, economic, and legal texts there is a great use of formalistic language that occurs in tablet after tablet, making it possible to reconstruct the bits of a text that have been lost. Even more important, preserved parts of personal names can be reconstructed in full because often the same people are listed on other tablets that were found in the same location. Reichel has written several computer search programs that make it easy to find matches in such cases.

Over the last two years, Reichel has been able to build a much more comprehensive picture of this palace and its development through time. One of Reichel's most significant discoveries is the continuation in service of families of officials for several generations (see figure on facing page). It is clear that they retained their powerful positions in the administration despite severe political turmoil and forced changes of government. An example of such a family of officials is shown in the accompanying figure, where four generations remained in the palace from the Ur III period well into the time of the Eshnunna kingdom, a span of more than a hundred years. Conclusions like this would not have been possible without the initial steps of computerizing all of the architectural, archaeological, and textual data, and analyzing them from a number of angles.

FOUR GENERATIONS OF ONE FAMILY IN THE PALACE OF THE RULERS



Example of a family line of officials that can be followed through four phases in the architecture of the Palace of the Rulers at Tell Asmar (Eshnunna). Until ca. 2025 BC, the official Abilulu worked as an administrator in the temple cella of Shusin temple. Following the end of the Ur III dynasty's control over Eshnunna and the desecration of the Shusin temple, Abilulu was transferred to work in the Palace Chapel. Abilulu's son, grandson, and great-grandson later formed a three-generation family line of highly specialized land surveyors. Their names are attested in a legal "archive" found next to the former cella of Shusin temple, which subsequently served as a "chancellery" and contained two kilns used for baking tablets. Scale ca. 1:1600

ARCHAEOLOGY

Another body of material in which we can also show significant results is the collection of stone weights that Colleen Coyle has analyzed. A set of weights consists of a large weight and fractions of that unit (e.g., a mina, a half mina, a quarter mina, etc.), with the fractions often indicated by incised marks. In her analysis of the weights, she has found evidence of several systems operating in the Diyala. This conclusion is important in viewing ancient economy as well as assessing the attempts of central administrations to regulate commerce. Some of the weights seem to be foreign to Mesopotamia, but they were needed because goods were coming from abroad and the merchants or administrators in the Diyala had to be able to make equivalents from the foreign to the local weight systems. That situation is not so unusual. Today, we have a similar mixing of weights and measures. Despite the fact that grams, kilograms, liters, meters, and kilometers are more rational, we do not abandon ounces, pounds, pints, quarts, feet, yards, or miles. And we have measuring devices and different sets of wrenches that reflect the mixture of systems.

In her work, Colleen has gained expertise in identifying stones and is now putting that skill to very good use on items such as beads, mace heads, and other stone objects. The petrographic work and related analyses using a scanning electron microscope and X-ray diffraction techniques can give crucial information that links specific items to one another by chemical markers. A set of stone objects with the same composition, especially if there is a rare mineral or element, can be assumed to have come from the same source, and most of the stones in Mesopotamia are from outside the area. Thus, if a set of objects that has been judged by style to have come from the Indus were to have a similar composition, we can say more surely that they were from that region.

We have accomplished a great deal in the past five years and are now beginning to move toward the "publication" stage, even while still finishing categories of objects. As a first step in our commitment to making this material available as soon as possible, we plan to put some of it (most likely the weights and the seal impressions) on the web with a link at the Oriental Institute home page or another University web page during the year. Some of the tablets may follow. We have just received word that the Provost's grant has been renewed for one more year. This grant will allow us to keep the staff on salary and buy a new computer to be used for web publication and digital imaging. Crucial in this work, as in our previous efforts, will be the interest and diligence of our volunteers. They have been magnificent and we hope they do not tire of us.
