

FIG. 1. THE BOAT-SHAPED LYRE (UPM 30-12-253) IN SITU, together with two box lyres. The silver box lyre (upside down) and the pair of copper stags on a rectangular base (collapsed across the upper left corner of the lyre upright) are now in the British Museum.

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The “Boat-Shaped” Lyre

Restudy of a Unique Musical Instrument from Ur

Maude de Schauensee

Stringed instruments have probably been around since the first time someone stretched a gut, rawhide, or fiber string over a resonator and plucked it. These early prototypes evolved over time into differentiated, often elaborately decorated and revered instruments. The University of Pennsylvania Museum is fortunate to house some of the earliest actual remains of stringed

instruments from the Near East: intricate and beautiful examples from the Royal Cemetery at Ur in southern Iraq, dating to about the middle of the 3rd millennium BC (see Kilmer, this issue). Among these is the unique “boat-shaped” lyre, with a silver stag adorning the front.

Several of the grave pits in this cemetery and a few of the tomb chambers—almost all of the latter had

been looted in antiquity—had musical instruments among their grave goods (Fig. 1). These were perhaps intended to provide melodic accompaniment for the dead. The general shapes of the instruments were preserved through their precious-metal sheathing or decorative inlays of non-perishable materials, or in some cases, their outlines were identified by the voids left by the perished materials from which they had been made. Nine lyres and two harps were found (see box on Lyres and Harps Compared), as well as other instruments including a pair of pan pipes and perhaps some sistra (rattles).

THE BOAT-SHAPED LYRE AS FOUND

The boat-shaped lyre was excavated during the 1928–29 season in the so-called Great Death Pit (designated PG 1237), the same grave that yielded the “Ram in the Thicket” (see Rakic, this issue, and Rakic Fig. 3). It was found with two box lyres now in the British Museum, London, and the Iraq Museum, Baghdad, and near a pair of badly corroded figures of copper roe deer standing in trees and set on a rectangular base (see Fig. 1). The boat-shaped lyre lay on the face that is now its “front.” The figure of a silver stag (identified as a roe

Lyres and Harps Compared

A lyre is a stringed instrument in which the strings run over a resonating chamber to a yoke consisting of two arms and a crossbar. In a harp, however, all the strings lie in the same plane stretched across an open frame at an angle to the resonator (see Fig. 8 in Kilmer, this issue). With the exception of the boat-shaped lyre, the lyres found at Ur had a rectangular wooden soundbox and were called “box lyres.” The boat-shaped lyre had a narrow, rounded, tapering soundbox. It was given its name by the excavator, C. Leonard Woolley, because of this shape.



FIG. 2A. LAPIS LAZULI CYLINDER SEAL AND IMPRESSION MADE FROM IT. The seal was discovered in the grave in which the boat-shaped lyre was also found (PG 1237). The scene shows a small, 5-stringed bull-headed box lyre being played as it is carried in a procession. UPM 30-12-2. Neg. S35-134382

FIG. 2B. IMPRESSION FROM A LAPIS LAZULI CYLINDER SEAL. A harpist (bottom register, far right) provides accompaniment during a festive occasion. The seal was found in Puabi’s grave (RT 800), lying against her right arm. Puabi was a woman of high rank, whose tomb was one of the very few not plundered in antiquity (see Horne, this issue). Her grave goods included a number of musical instruments.

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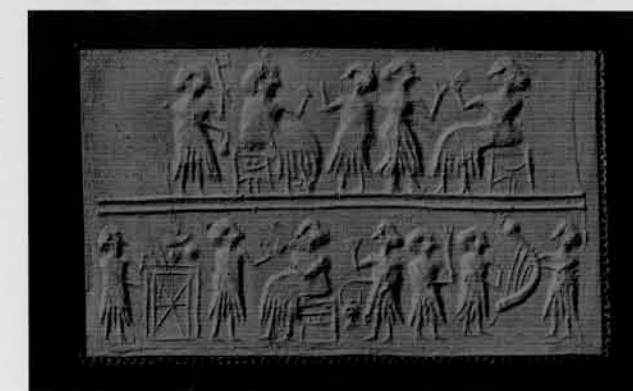




FIG. 3. THE BOAT-SHAPED LYRE
DISASSEMBLED prior to the start of work.
Photograph by Tamsen Fuller, 1993

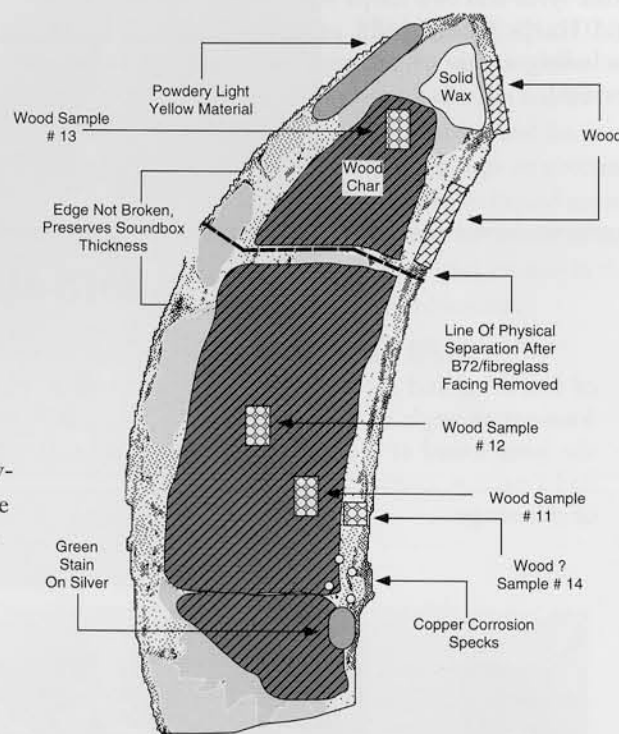


FIG. 4. VESTIGIAL TRACES OF WOOD
WERE FOUND ON THE INTERIOR SURFACE
OF THE SILVER SHEET which had completely covered
the soundbox of the lyre. They are indicated by the
hatched shading on this computer graphic. Other find-
ings and sampling areas are also shown.
Computerized documentation diagram by Tamsen Fuller, 1994

deer, native to the northern grasslands rather than the southern alluvial plain of Ur) stood with his front hooves supported by the branches of a copper tree, just like the goat in the "Ram in the Thicket." His rear hooves stood on the top of the soundbox and conformed to its width, while the front upright of the instrument passed between his horns. Like the "Ram," the stag's head was flanked by two branches, with a central branch at his chin. Unlike the "Ram," however, each branch was tipped by a single spade-shaped leaf.

The wooden soundbox had been covered with a single silver sheet which ran unbroken from side to side over the base, while a separate narrow strip completely covered its top. This sheathing and other non-perishable parts were all that survived and defined the lyre. Although Woolley carefully and accurately recorded and described the lyre as he excavated it, its unique shape and the equally unique presence of the stag soon raised

questions. The rounded soundbox and rounded shape of the rear upright resembled those of a harp; while the similarity of the stag to the two copper stags, as well as its use in the context of a musical instrument, raised the question of whether the stag was part of the instrument. Before the new conservation started in 1994 the issues of whether this was a single instrument or parts of two and the inclusion of the stag had already been addressed, but the new study, using modern analytical techniques, provided an opportunity to confirm the previous conclusions.

When found the lyre was in such brittle and fragile condition that it had to be conserved simply to lift it from the ground. According to Woolley, "The [silver] metal was not only cracked into innumerable pieces but was so completely reduced to chloride that it was in many places no more than powder which had to be solidified with wax" (1934, pt. 2:122). Bandage, plaster,

and wooden supports were also used to stabilize the lyre. After additional conservation work both at the site and at the British Museum, including adding metal supports to the soundbox and stag and carefully placing the lyre in a plaster surround, it was shipped to the University Museum in 1930. There it remained on display until 1979, when deterioration of the restoration required its removal and disassembly (Fig. 3).

AN OPPORTUNITY FOR RESTUDY

In 1994, with conservator Tamsen Fuller of Northwest Objects Conservation Laboratory, we embarked on the long process of conserving and studying the boat-shaped lyre to prepare it for its return to exhibition. As well as restabilizing the fragile remains and removing unfortunate cosmetic reconstructions imposed on the tree, the work offered an opportunity to restudy the lyre completely. The reverse of the lyre, the first side seen by Woolley, had not been visible since the instrument was placed in the plaster surround.

One of the goals of the restudy was to accumulate as much new information as possible about ancient lyres. Little is known about the tuning or sound of these instruments other than from descriptions in later texts (see Kilmer, this issue). We hoped to learn from the physical remains of the lyre something about the materials from which the instrument had been made, how it was strung, and how its sound was shaped, produced, and projected. To this end we took advantage of several technologies that were unknown at the time of excavation to try to add to the information in Woolley's original careful description. Many scientists and scholars provided their specialized knowledge and services.

As a result of the new study, most of the conclusions which had been previously drawn, particularly those related to what parts belonged together and the stringing, were completely confirmed: all the parts came from one, not two, instruments; it had been strung from the yoke, not the rear upright, to the soundbox; the stag was part of the lyre (de Schauensee n.d.).

HOW THE LYRE WAS MADE AND STRUNG

The interior of the silver sheathing was carefully examined in an effort to gain information about the

construction of the soundbox. The configuration of a stringed instrument's resonator, as well as the wood from which it is made, will affect the type and quality of the sound produced. Unfortunately, only the fact that the soundbox had been made of sheets of wood with the grain laid horizontally could be determined from the remains; this was all that was preserved in residual markings found in the silver chloride corrosion products of the sheathing (Fig. 4). The structure of the few fragments of wood found during conservation of the instrument was not well enough preserved, nor free enough from the wax used in the field conservation, for identification. Compositional analysis of the silver sheathing conducted by proton-induced X-ray emission (PIXE) spectroscopy showed it to have been 99 percent pure.

Examination of the sheathing confirmed that the soundbox had no opening other than the narrow slit on one side where the strings had been attached. This

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opening was not large enough to serve as a sound hole from which the vibrations created within the box could emerge (Lawergren and Gurney 1987). It has been suggested that the bottom of the soundboxes of box lyres, such as the University Museum's bull-headed lyre and the British Museum's silver lyre, were left open so that the resonant sound described in later texts could emerge. While this is possible, the folded edge

of the sheathing wrapped over the narrow base of the boat-shaped lyre's soundbox shows that such was not the case here. Direct evidence of how the sound was produced or what type of sound was favored therefore remains elusive.

There was no evidence of a bridge on our lyre, but one would have been required for play, and the impression of a bridge was found on the silver lyre in the British Museum. Markings of the strings were clearly preserved in the silver chloride above the slit, indicating that they were attached here (see Kilmer, this issue, for a discussion of how this might have been done; also Kilmer's Fig. 9). At the yoke, however, only the marks of the wrappings that would have been placed under the strings were preserved (Fig. 5a). Macroscopic photographs suggested that the wrappings over which the strings were wound may have consisted of a sort of loosely braided or criss-cross wrapped plant fiber, such as is still sometimes used for lyres in some parts of Africa, rather than woven cloth (Fig. 5b). Unfortunately, attempts to study the markings on the yoke at much higher magnifications produced ambiguous results.

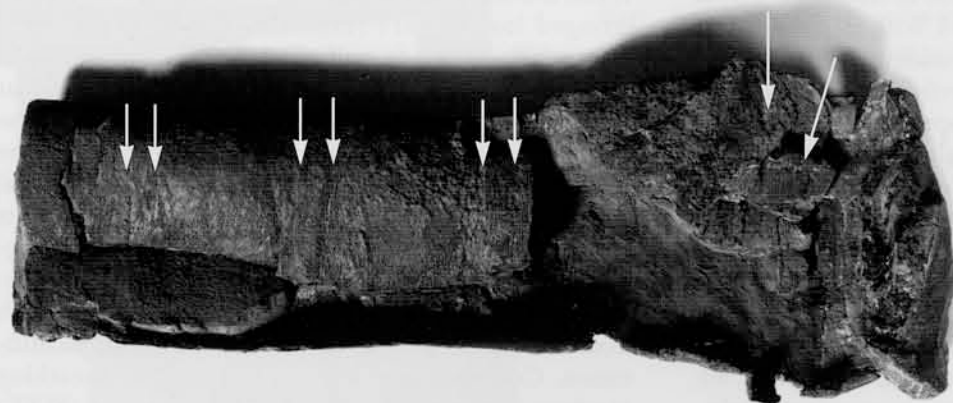
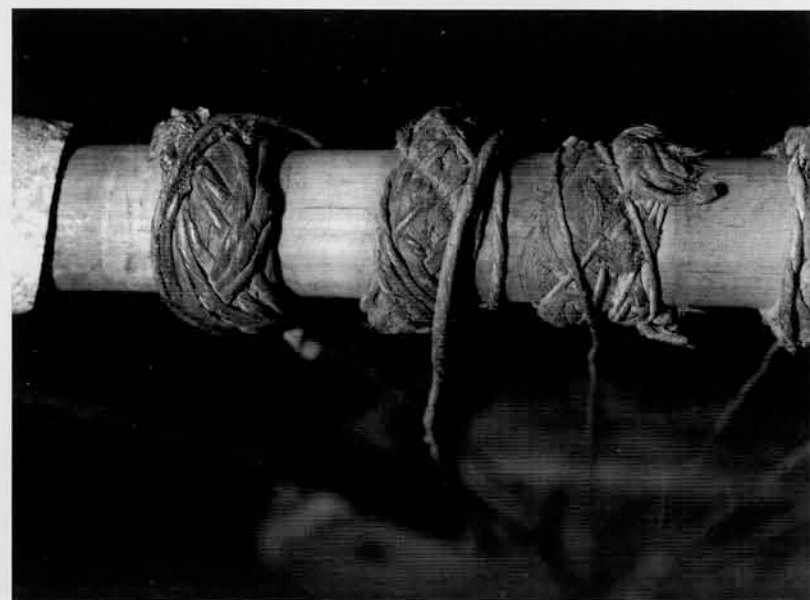


FIG. 5A. MARKS (ARROWED) FROM THE WRAPPINGS PLACED UNDER THE STRINGS WERE PRESERVED on this segment of the yoke. The wrappings seemed to have been used in pairs, but how the strings were bound around the wrapped yoke or what they were made of remains a mystery as no evidence for them was preserved.

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FIG. 5B. DETAIL OF A LYRE FROM UGANDA in the University of Pennsylvania Museum shows how the strings are wound around the yoke. The string bundle is turned to tighten or loosen the tension of the string. (See Kilmer Fig. 10a in this issue for a view of the whole lyre.)

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QUESTIONS ANSWERED, QUESTIONS RAISED

X rays and CAT scans were obtained to provide information about previous conservation efforts, the condition of the preserved silver, and the construction of the lyre. What was clearly revealed by conventional radiology was how the silver sheet was used and attached. Each part of the instrument—the uprights, the yoke, and the body and top of the soundbox—had been separately covered with silver sheet which, with the exception of the yoke, was held in place by identical small tacks of silver or silver alloy (Fig. 6). No tacks were found in the yoke. Here, the edge of the sheet had been folded over onto itself and hammered into place. A

separate cap had been fitted over the end of the yoke and secured by bitumen.

Some X rays raised questions, however, such as the revelation of apparent staple-like tacks in the rump of the stag, but these were subsequently clarified by CAT scan images (Fig. 7). CAT scans also provided the completely new information that the stag's head had been modeled out of bitumen over an armature of copper rods and pins (Fig. 8a, b). This method of using bitumen is of particular importance because although its use as a filling or as a support for hammered sheet metal was well known, both at Ur and elsewhere, its use with an armature was previously unknown.

The body of the stag had been made of wood in individual sections that were later joined to each other.

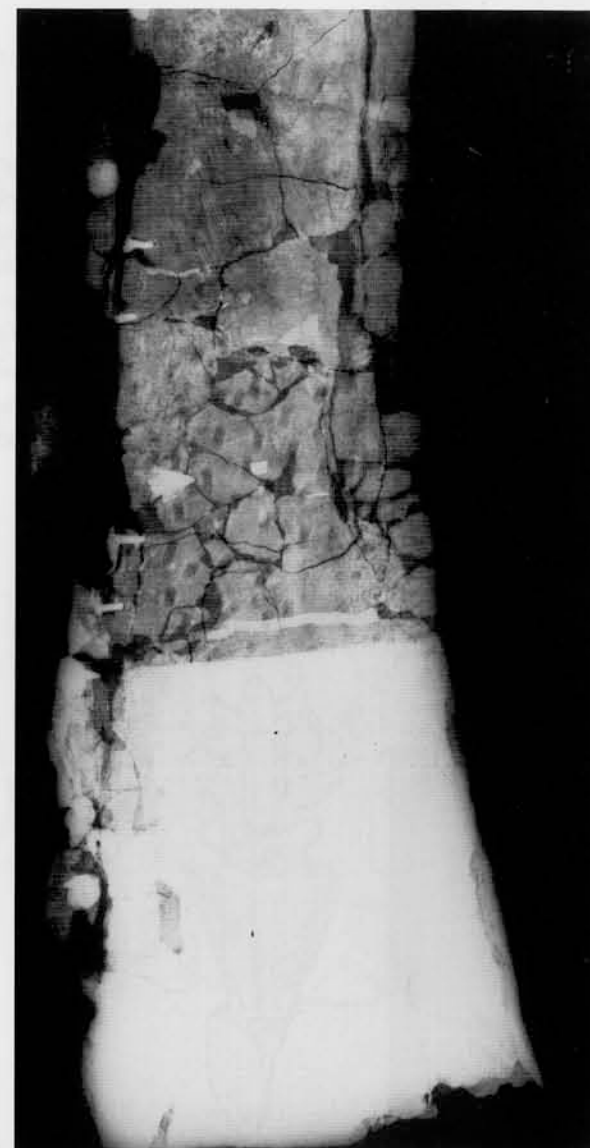


FIG. 6. THIS X RAY REVEALED THE PRESENCE OF SMALL TACKS SECURING THE SHEATHING on the oval rear upright to the wood beneath. It also verified the absence of the large "keys" used for stringing and tuning the harps found at Ur, making it clear that such a stringing could not have been possible for the boat-shaped lyre. The denser area in this X ray shows that a decorative overlay covers the lower part of the silver-clad upright, imitating the overlay used on the base of the wooden arm of the harps.

X ray SL 6

While a single heavy copper nail runs through the rump of the animal, its purpose and the method used to attach the legs to the body remain unknown. Mortise and tenon construction, as suggested by Woolley for assembling the parts of box lyres (1934, pt. 1:257), may have been used here as well. Each section was covered with silver sheet held in place by tacks before assembly (Fig. 9a, b). This is a technique also seen in other pieces from the Royal Cemetery now in the University Museum, including both the gold sheet-covered head and the silver-backed beard of the bull-headed lyre and the gold-covered sections of the goat in the "Ram in the Thicket" (see, respectively, Kilmer and Rakic in this issue).

While the technical studies were being carried out, conservation work proceeded: removing the old

wax, bandage, plaster of Paris, and other materials, cleaning the surfaces, and replacing fills and supports with inert materials. Fragments of wood found during conservation of the stag figure were identified as probably belonging to the box (*Buxus*) or pistachio (*Pistacia*) family, neither of which was native to the alluvial plain of southern Mesopotamia, but rather to areas further north. Meticulous records of the conservation and the technical findings were made, in written records, digitized images and schematic renderings, slides, and black and white photographs. Finally the lyre was returned to exhibition (Fig. 10).

Most of what we know about music, musicology, and music theory comes from later texts, while infor-



FIG. 7. CAT SCAN OF THE STAG'S HINDQUARTERS. While the X ray of the stag's rump showed what looked like staples, the subsequent CAT scan indicated that they are actually rows of tacks along each haunch.
CAT scan SL 2

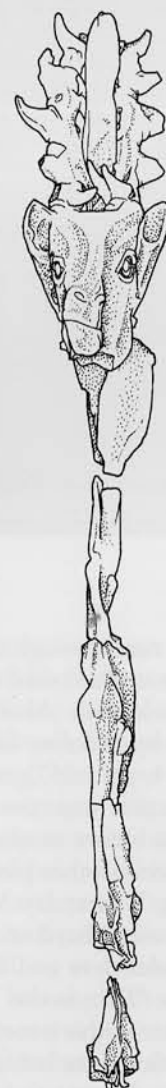
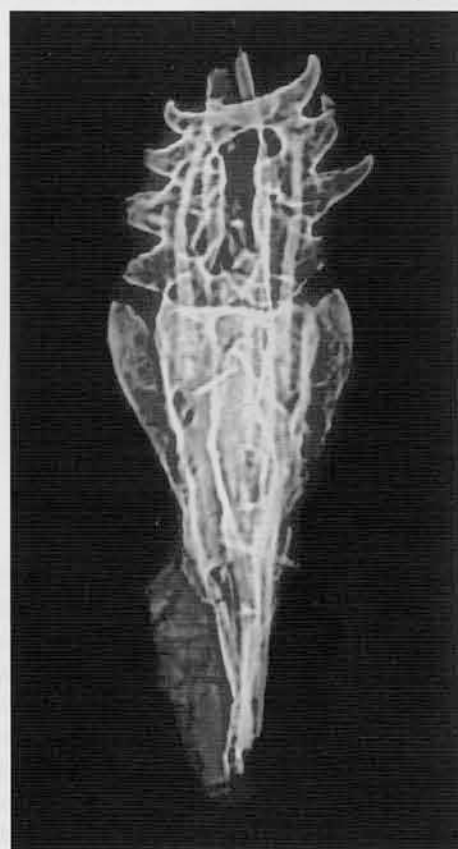


FIG. 8B. FRONT VIEW OF THE STAG'S HEAD AND FOREQUARTERS showing its appearance at the time of the study and CAT scan.

Drawing by Jennifer Hook, 1995

FIG. 8A. THIS CAT SCAN REVEALS THE COPPER RODS OF THE ARMATURE INSIDE THE HORNS, the pins through their bases stabilizing them, and the small pins supporting the tines. A single large copper nail apparently secured the head to the wooden block forming the neck support.
CAT scan SL 4

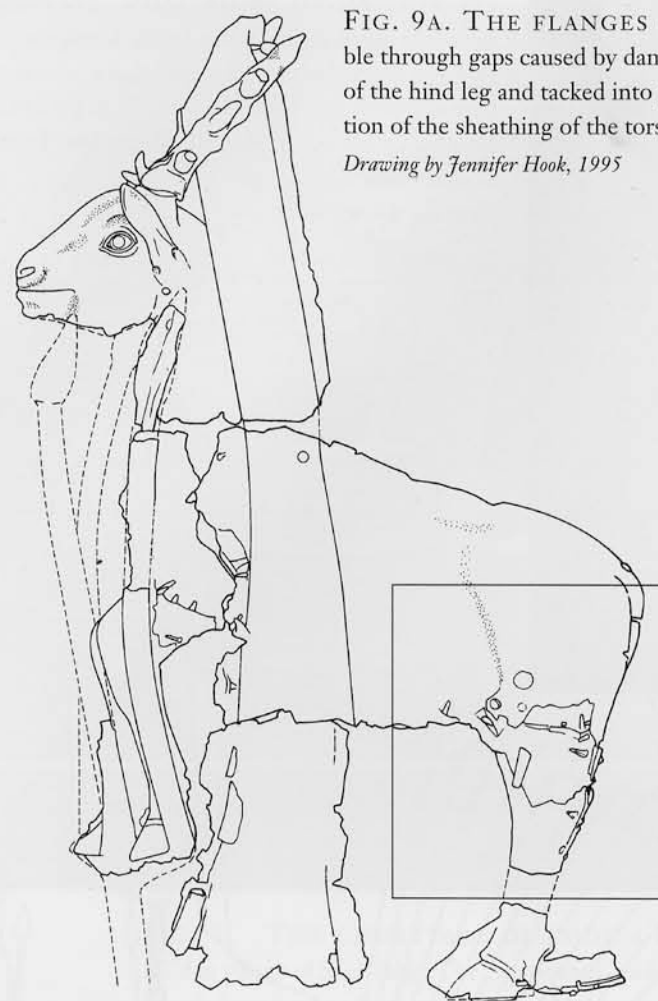


FIG. 9A. THE FLANGES OF THE SILVER SHEATHING ON THE STAG are visible through gaps caused by damage during burial. The sheathing was folded over the top edge of the hind leg and tacked into place prior to assembly with the body and prior to the installation of the sheathing of the torso. This covered and hid the upper leg assembly.

Drawing by Jennifer Hook, 1995



FIG. 9B. A DETAIL OF THE BACK LEG shows the flange and some of the tacks used to secure it to the leg before attachment to the body of the stag.

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mation about the instruments themselves comes largely from representations and texts. That from actual early instruments is rare, and our newly gained knowledge supplements the meager amount of information previously known. As we expand our knowledge, our respect for the skill and expertise of the early craftsmen who made the instruments, played them, and wrote the music for them increases as well (Fig. 11). **Z**

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For the complete account of the study and conservation of the boat-shaped lyre as well as of the bull-headed lyre, see Maude de Schauensee, *Two Lyres from Ur* (Philadelphia: University of Pennsylvania Museum. Forthcoming). Funds for this publication and for the case for the boat-shaped lyre were provided through the generosity of Dr. and Mrs. Gregory Maslow. Funds for the conservation and study were provided by an Institute of Museum Services Conservation Grant matched by a gift from the Women's Committee of the University of Pennsylvania Museum in honor of Dr. Robert H. Dyson, Jr., on the occasion of his retirement as The Charles K. Williams II Director of the Museum.

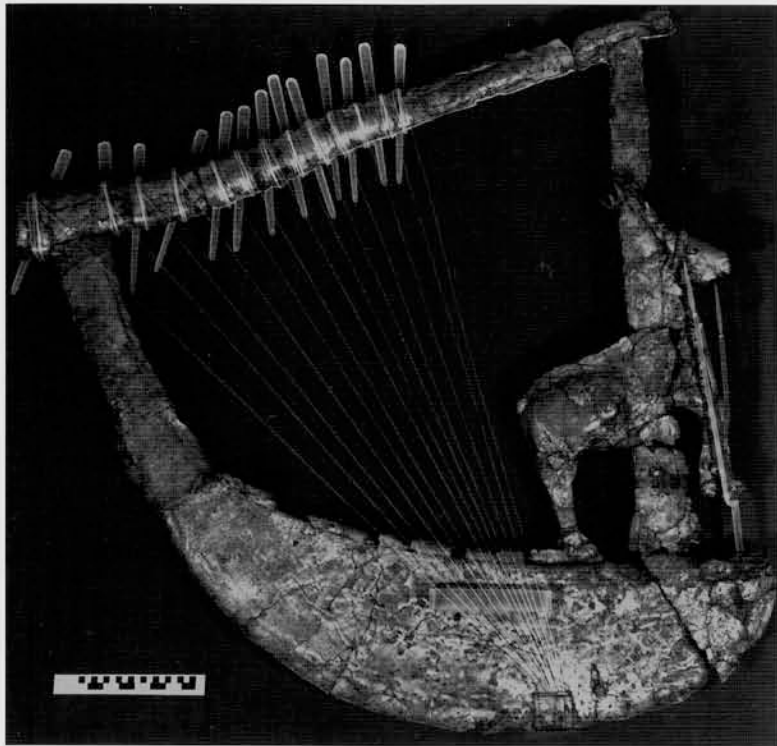


FIG. 10. THE COMPLETED LYRE READY FOR ITS RETURN TO EXHIBITION. The missing parts for which direct evidence was found during the conservation and restudy or in field records have been restored in frosted plastic. Parts that were known to have existed but for which there was no direct evidence have been restored in clear plastic.

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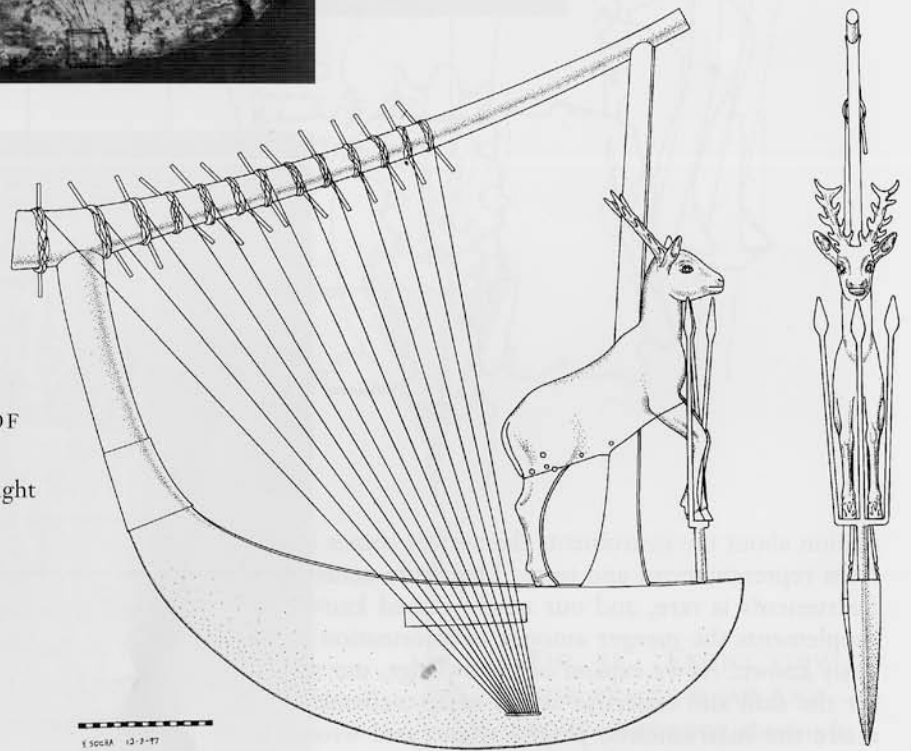


FIG. 11. RECONSTRUCTION OF THE ORIGINAL SHAPE OF THE SOUNDBOX, showing how the lyre might have looked during use.

Drawing by Veronica Socha, 1997

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