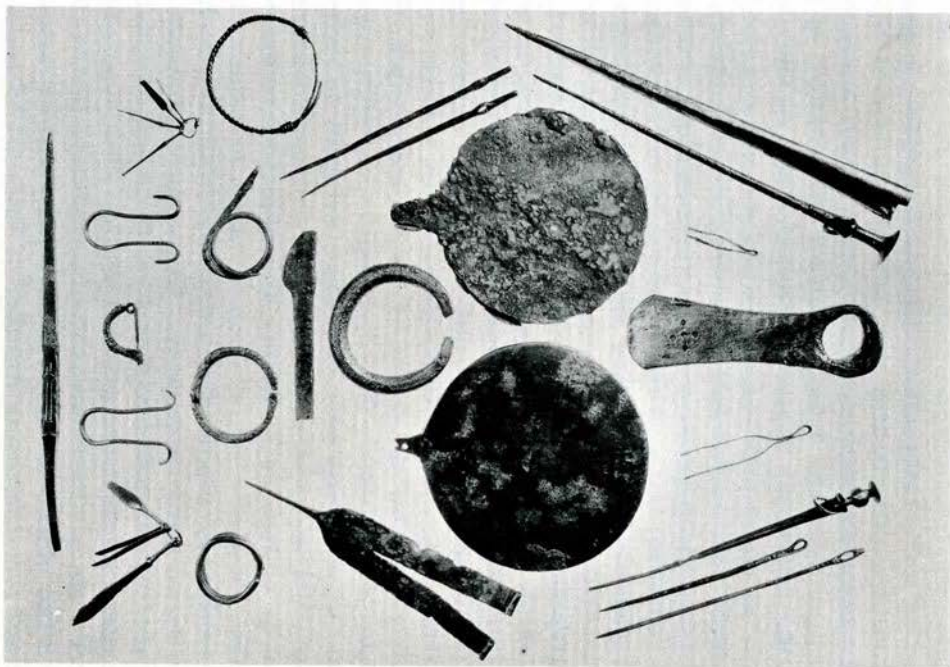


ANCIENT BRONZES FROM IRAQ, BEFORE CLEANING



ANCIENT BRONZES FROM IRAQ, AFTER CLEANING

*The Cleaning
and Restoration of
Ancient Bronzes*

ALMOST without exception the bronze and copper objects received in the Museum are in the process of disintegration. This disintegration is due chiefly to the chlorides and nitrates that are to be found in the soil in which the objects have been buried, and which have converted the constituents of the bronze into an incrustation of blue or green with underlying layers of copper oxide. The degree of disintegration varies with the content of the soil and the content of the object and may result in a simple discoloration, in the formation of a thick green crust, in the complete destruction of the metal core, or, last and most serious, in various stages of the so-called 'Bronze Disease.' Any one of these conditions will in time reduce the object to an indistinguishable mass of powder.

The advantages of cleaning and restoring these ancient bronzes are three-fold. First, eradicating, or at least arresting the progress of, the Bronze Disease. Second, restoring the object to its original form, which has become distorted by the presence of the incrustation, and so make it possible for the scholar to make a comparative study of the forms of the different types of bronze and copper implements. Third, bringing to light any designs which the incrustations may have obscured such as incised decorations, makers' signatures, hieroglyphs, or cuneiform signs which would be of assistance in dating the object or more definitely establishing its use.

The cleaning of copper and bronze in this Museum has been done by the electrolytic process. This process consists of suspending the object by fine copper wires in a tank of caustic soda, through which an electric current is passed. At the end of a period lasting from six to nine months the incrustation has been broken down and the object is ready for the final steps of restoration.

With the ever-increasing number of bronze and copper specimens that come yearly into the Museum from the several expe-

ditions in the field, it was decided recently to introduce other methods of cleaning and restoration in order that a greater number of objects could receive the necessary treatments as quickly and promptly as possible. The most effective and satisfactory of these methods is a zinc and caustic soda treatment. In this process the object is buried in zinc and covered with a solution of caustic soda. After a period of from twenty-four to forty-eight hours, the object is taken out and the incrustation is so undermined and eaten away that it is easily removed by a careful application of the mechanical treatment. This process often leaves a layer of black or red oxide which may be removed either by frequent washings in running water or by momentary emersion in an acid bath. The object is then carefully brushed and burnished and coated with a preservative shellac. It has been frequently found that this treatment not only restores the object to its original form but also restores life and elasticity so that an object which before treatment was rigid and brittle after treatment was flexible and mobile.

Plates VIII and IX, while not exact duplicates, give an idea of the condition of the bronzes before and after cleaning. The objects appearing in both plates which yielded most satisfactorily to treatment are the two ringed pins, the bracelets, and especially the so-called chatelaine, which is shown in the left foreground of both photographs.

In the center of Plate IX are two mirrors, one cleaned and the other not yet cleaned, showing the degree to which corrosion may distort and destroy an object, and the extent to which treatment may restore it. The mattock in the right center of Plate IX responded well to treatment, and cleaning revealed the trade-mark or owner's sign in the form of five circles set in the shape of a cross. Of especial interest, however, is the lance butt (extreme left) upon which was unexpectedly discovered a well cut cuneiform sign of a distinct archaic period. (Regarding

this sign, see the article by Dr. E. A. Speiser in the *Bulletin of the American Schools of Oriental Research*, April, 1933.)

M. R. W.

*A Reconstruction
of a Burial
from Persia*

THERE has recently been installed in the gallery devoted to the results of the Persian and Assyrian Expeditions a restoration of one of the most striking burials uncovered at Damghan, Persia, by the recently terminated Joint Expedition. The grave was excavated in 1931 by Dr. Erich Schmidt, field director of the Expedition. It is obviously that of a warrior, probably killed in battle and buried with the finest of his earthly possessions. Due to careful drawings, photographs, and measurements made in the field, the restoration is substantially accurate in regard to the position of the skeleton and of the associated objects. The reconstruction [Plate X] is the work of Mr. Paul Neimeyer, and the simulated ground, the base of which is carefully moulded *papier maché*, represents, it is felt, a great advance in restorations of this character.

The Warrior, and many other individuals whose graves were found in the same stratum, belonged to the third and last phase of the occupation of Tepe Hissar, it being abandoned thereafter as a habitation. The culture of the people of Hissar III was relatively high, as is evidenced by their proficiency in the use of copper and the precious metals for weapons, tools, and vessels, by the well executed gray pottery, and by the employment of alabaster for vases, bowls, and utensils. The use of alabaster may perhaps indicate influences from Mesopotamia where this stone was much used even in earlier times. Otherwise the culture of Hissar III seems more closely related to that of the Turcoman plains, north of Persia, and east of the Caspian Sea, than to those of inner Iran.

In the Grave of the Warrior particular note should be made