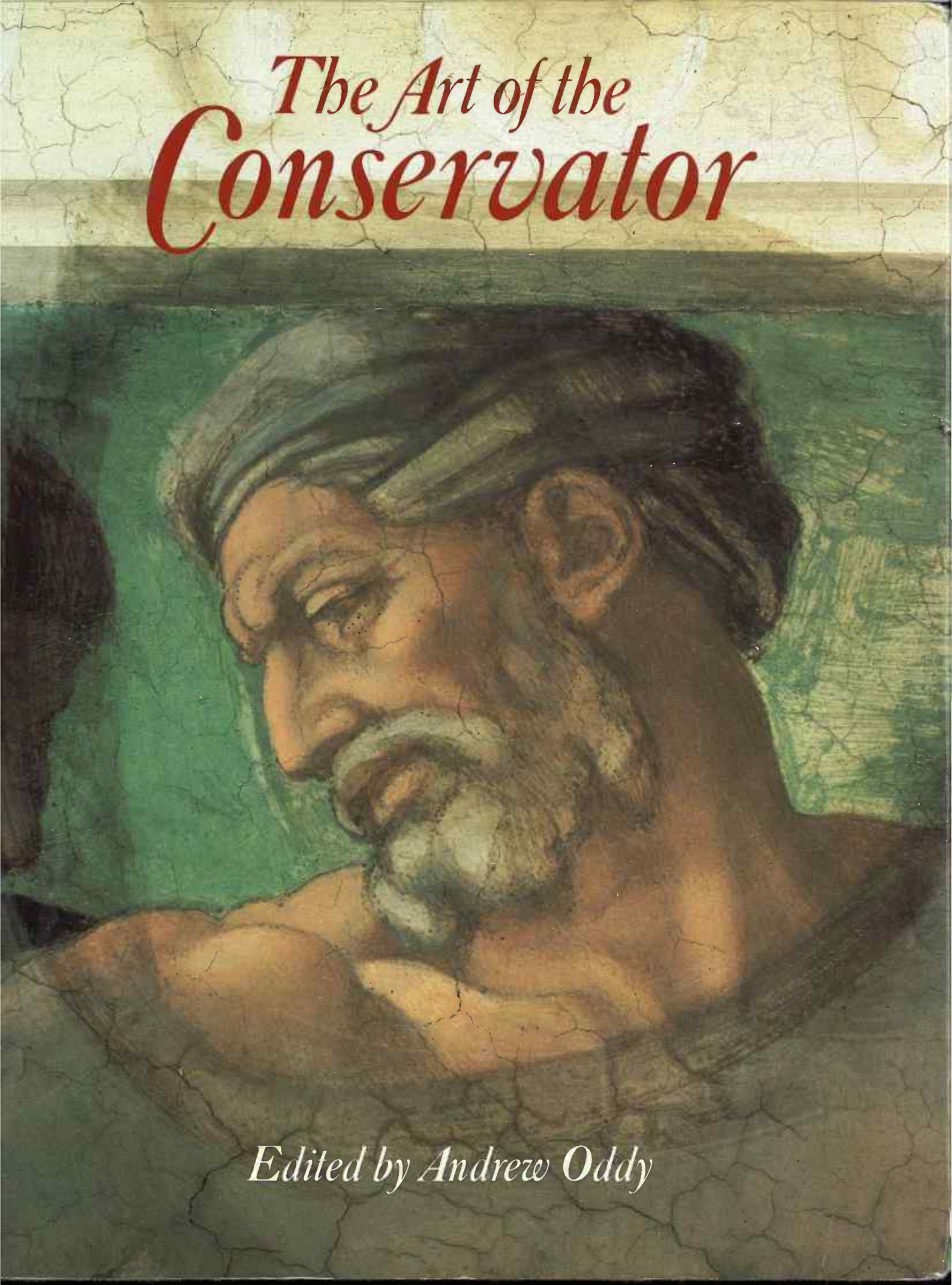
The Art of the Conservator



Edited by Andrew Oddy

10 The Sophilos Vase

Penelope Fisher

In 1971 the British Museum acquired an extremely important and beautiful
147 Athenian black-figured *dinos* (wine bowl) and stand dating from about 580 BC. Signed by the painter Sophilos, the bowl and stand are together commonly known as the Sophilos Vase. Sophilos is well known for his vases decorated with animals, but only four signed examples survive and this is by far the most complete. The bowl and stand together measure an imposing 71 cm (approx. 28 in) tall, and the bowl is nearly 42 cm (16½ in) in diameter at its widest point.

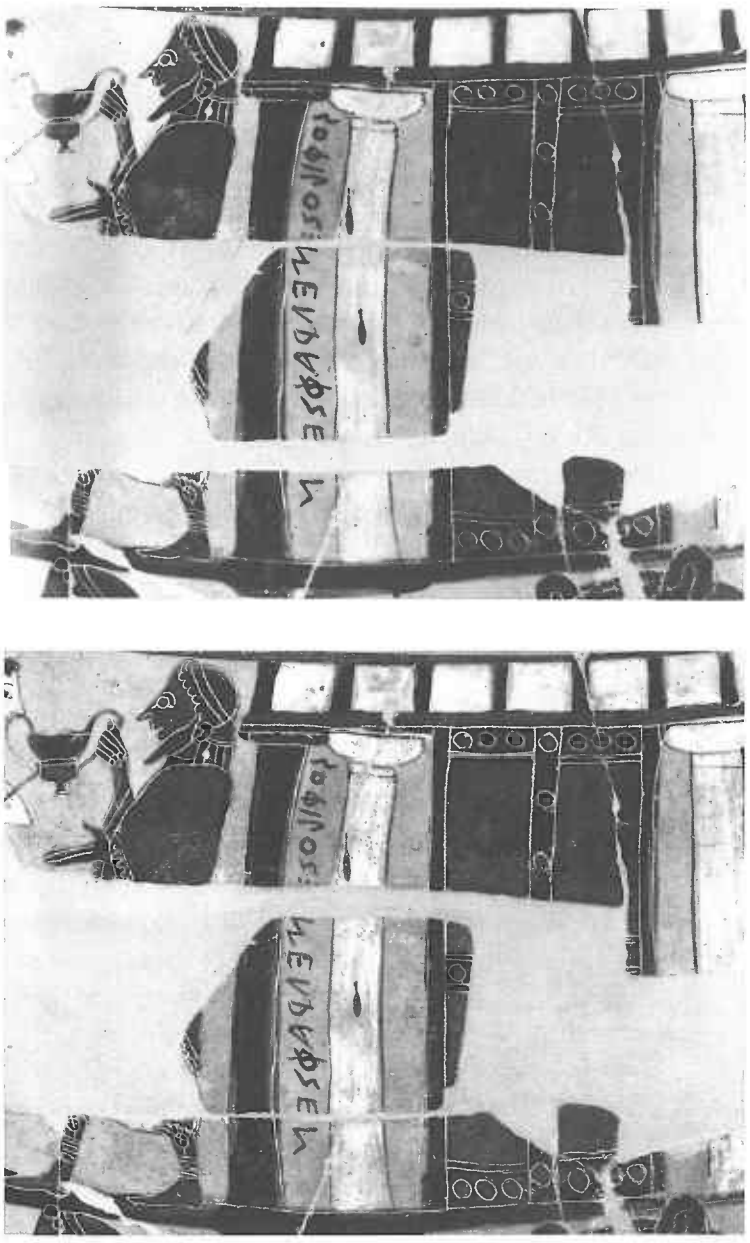
The lower three friezes of the bowl and four of the stand are decorated with a total of fifty-two animals and fantastic monsters: lions, panthers, boars, stags, rams, goats, water-fowl and sirens (woman-headed birds). The uppermost frieze portrays the arrival of the divine guests at the wedding feast of Peleus and Thetis, the parents of Achilles. The frieze starts and finishes at the house of the newly wedded couple,
150 where Peleus stands waiting to greet his guests, who form a long procession in front of him. The deities, each with their name inscribed, include Iris, Dionysos, Zeus and Hera, Poseidon, Aphrodite and Apollo, and form a veritable 'Who's Who' of Greek mythology. Between two columns of the house, immediately behind Peleus, is the artist's signature: *Sophilos:megrapsen* ('Sophilos painted me'). The figures and animals are painted in a lustrous black gloss on a terracotta background, with details highlighted in deep red and white and with incised lines. The flat surface of the rim is decorated with a double lotus and palmette chain (repeated on the stand), while the bottom of the bowl is covered with a whirligig design, although this cannot be seen when the bowl is on the stand.

When the Vase was acquired by the British Museum it was already in a restored state. It had been assembled from many fragments, and only a few areas were missing. The surface of the Vase was in remarkably good condition, and the restoration looked recent. However, soon after its acquisition the curator noticed that because the Vase had been allowed to get out of shape during reconstruction, there
148 were several gaps between fragments that should have joined; in particular, there was a gap through the signature, causing it to read *Sophilos:megrapse n.* The Conservation Department was asked to take out the misplaced piece and move it downwards, so that the signature would read correctly. This was done by applying a poultice of paper pulp mixed with methylene chloride, a strong solvent used in paint-stripper, around the edges of the sherd to be moved. When the poultice had softened some of the resin surrounding the sherd, the resin was scraped away and another poultice applied. This painstaking process was repeated over and over again until the sherd was loosened and could be extracted. After cleaning any remaining adhesive from
149 the sherd and the surrounding pieces, the sherd was replaced lower down.

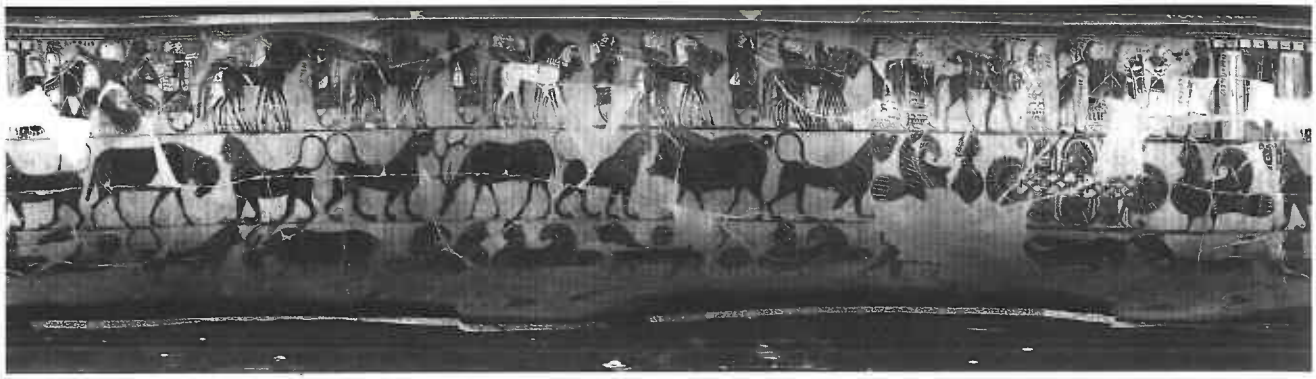
151 In 1978 the Museum acquired five more fragments belonging to the Vase. Three

147 The Sophilos Vase before conservation. Made in Athens, *c.*580 BC. H. 71 cm. British Museum.

of these had formed part of the collection of the J. Paul Getty Museum in California for some time, while the other two were purchased on the open market. Dr Jiri Frel, then a curator at the Getty Museum, recognised that all five fragments belonged to the British Museum vase. The Getty Museum initially loaned the fragments to the British Museum, but has since made a permanent gift of them. The fragments all featured important areas of the decoration. The three original Getty fragments consisted of a piece of decorated rim, a fragment of drapery, and a piece (in reality, two pieces joined together) with the body and legs of the figure of Iris as well as part of the garment of Peleus himself. The larger of the other two fragments shows the rear of the chariot driven by Poseidon and the front legs of Aphrodite's horses, whilst the smaller fragment portrays the heads of three *horai* (goddesses of the three



148, 149 The artist's signature before and after the misplaced fragment was moved in 1971.



150 Peripheral view of the Vase, showing the arrival of the divine guests at the wedding of Peleus and Thetis and a frieze of animals.

seasons, possibly indicating growth, flowering and ripening of vegetation) walking beside a chariot driven by Athena. It was obviously desirable that all five fragments should be incorporated into the Vase, and so it was returned to the Conservation Department for a second time.

Seven years had passed since the signature fragment had been moved and the conservator who had worked on the Vase had left the Museum, so it was not possible to discuss any of the difficulties that might be encountered when inserting the new fragments. After detailed examination of the Vase it was realised that the material which had been used in the original 'commercial' restoration before 1971 was in fact totally unsuited to the conservation of Greek pottery. It appeared to be very hard and brittle, and was shown by scientific analysis to be a polyester resin. This had been used both as an adhesive to stick the sherds together and as a gap filler.

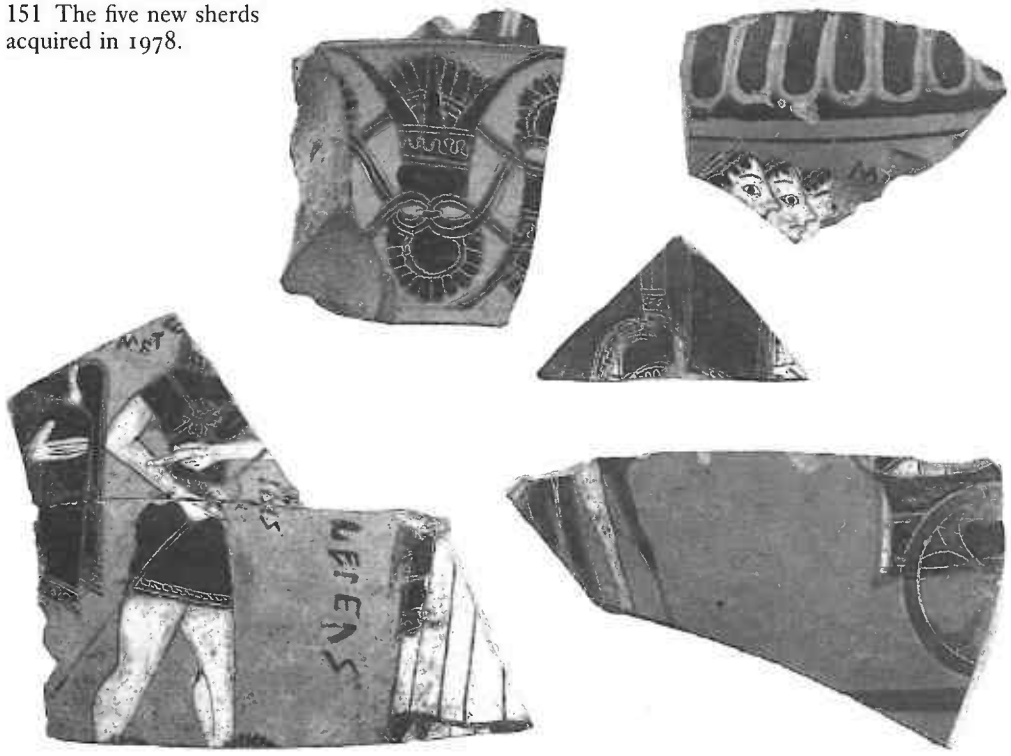
Finding the positions of the new fragments was easy, but removing the resin which filled the gaps was much more difficult. The rim piece was the easiest to deal with, so that was tackled first. The position of the piece was marked on the filled area, and a saw cut made with a very fine piercing saw down to about 2 mm ($\frac{1}{16}$ in) from the pottery edge. The vibration from the saw was in fact enough to release the piece of resin infill. This showed that the polyester fill had not bonded to the pottery as strongly as the adhesive between the sherds. The other filled areas, which were totally enclosed and so harder to get at, were scored around with a sharp blade. Owing to the brittleness of the resin it was then possible to remove the infill with a sharp blow from a hammer and chisel. Despite its success, this was an unnerving experience for those involved. No solvents were used, as it was thought they might weaken the surrounding restoration and consequently the whole Vase. Once the filling resin had been removed it was relatively easy to glue the new fragments into place with a cellulose nitrate adhesive, which could be easily softened for adjustment, or for the fragment to be removed at a later date, by the application of acetone as a solvent. The gaps around the fragments were filled with plaster of Paris for a perfect finish, and the plaster painted to tone in with the earlier restoration.

In April 1983 the Vase was returned to Conservation yet again. The gallery in which the Vase was displayed was due for refurbishment, and this was seen as an ideal opportunity to correct all the inaccuracies in the current restoration and to replace the unsuitable polyester resin which had been used. It was therefore decided to dismantle the Vase and reconstruct it again completely.

The polyester resin had been used in a liquid form for sticking the sherds together, but thickened with an inert bulking agent to form the infill. The resin had also been coloured to match the body of the Vase by the addition of pigment. The infill therefore resembled the original fabric too closely from an ethical point of view, as this could lead to confusion between the restored areas and the original pottery. Furthermore, because the resin was so strong, as it began to age and shrink it had
152 placed so much stress on the Vase that new cracks had started to appear. This was most apparent on the base of the stand. The thinner resin used for sticking the fragments together had also penetrated the porous pottery. It would therefore be very difficult to dismantle the Vase, and it was imperative that this be done without causing any further damage to the original fragments.

Where the resin had been thickened and used to fill the missing areas, however, it had not been able to penetrate the pottery. For this reason it was decided to remove the infilled areas first. A small hole was carefully drilled through the resin, taking care not to drill through any pottery that might be projecting into it. A very fine piercing saw was passed through the hole, and the resin infill was carefully sawn around, keeping about 3 mm (approx. ⅛ in) from the pottery edge. Once most of the resin had been removed, it was possible to extract the remaining slivers of infill with small square-ended pliers. The resin came away from the pottery very easily and cleanly, so all the filled areas were removed in this way. Although it was now full of holes, the Vase remained intact.

Undoing the joins was much more difficult, owing to the very strong grip of the thinner adhesive resin. The Vase was immersed in a bath of tap-water and left to soak, in the hope of thoroughly saturating the pottery and weakening the joins. The

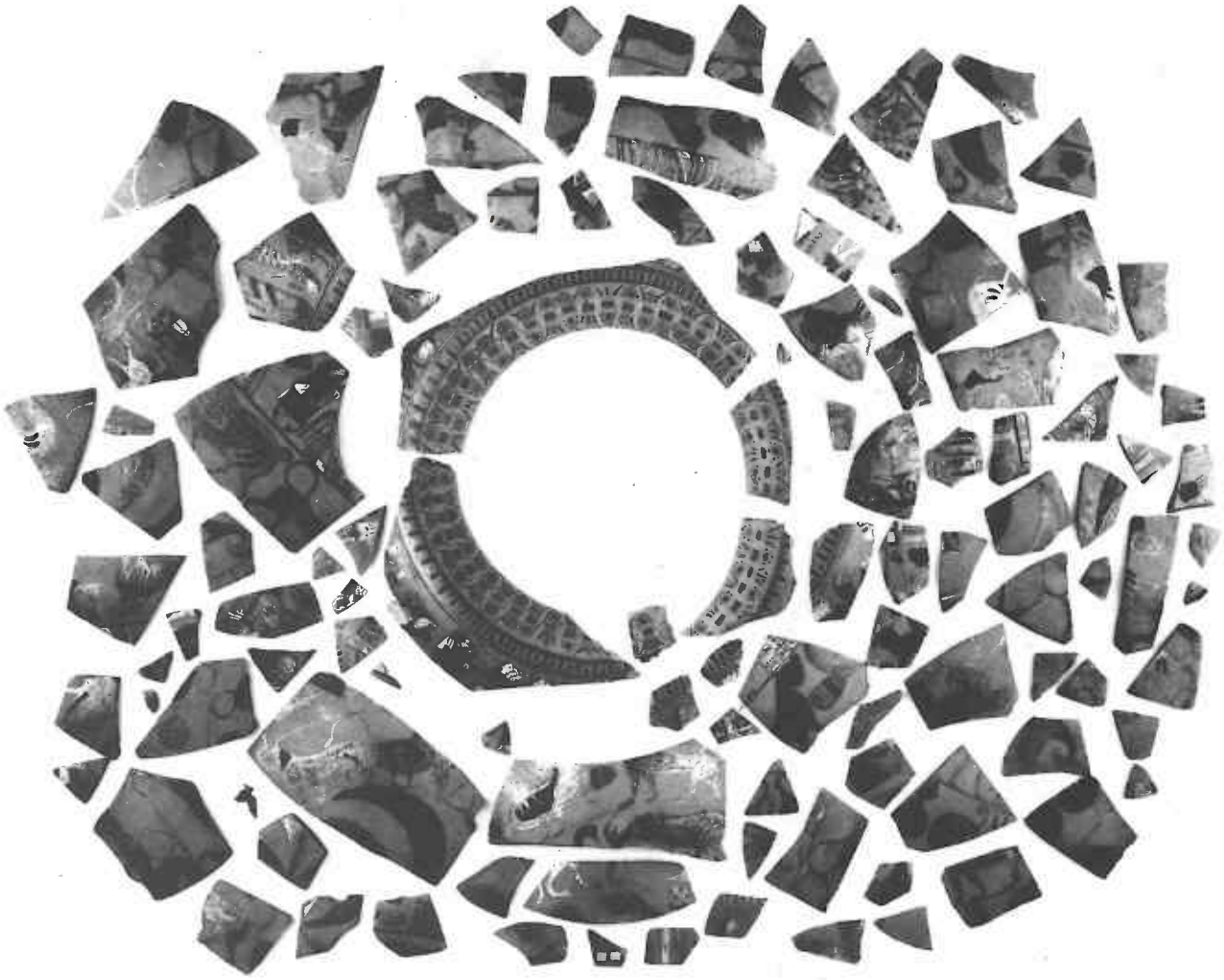


151 The five new sherds acquired in 1978.

152 Detail of the base of the stand, showing the new cracks which had begun to appear as a result of stress caused by the shrinkage of the old resin.

water was changed every day, and after four weeks the resin seemed to be relaxing its grip. At this point the water bath was exchanged for a bath of the organic solvent acetone. The acetone would not dissolve the resin but would soften it so that it would eventually break up into small pieces. The bath itself was a polythene container which exactly fitted the Vase, giving the sides some support. After a short while the joins began to give way, and the Vase was dismantled piece by piece. Because the solvent broke up the adhesive rather than dissolving it, the pieces had to be gently pulled away one by one. The advantage of this method was that the Vase did not collapse under its own weight.

The edges of each piece were then brushed to remove the softened resin. However, even after this treatment, minute traces of resin remained. Any traces of old adhesive would result in distortion when the time came to stick the pieces together again, and with so many pieces that distortion could be magnified many times. The pieces were therefore put through a third and final cleaning process using a water-washable paint remover containing a strong solvent dispersed in a thixotropic gel. This was painted along the edges of the sherds. The sherds were then wrapped



153 The fragments of the Vase laid out before reconstruction.

in aluminium (cooking) foil to prevent the solvent from evaporating and left until the paint remover had softened and swelled the remaining traces of adhesive, which were then picked out with a sharp scalpel. After a final rinsing the fragments were laid out to dry.

By September 1983 the 118 fragments were ready to be reassembled. They were
153 laid out on a large table, with the rim pieces in the centre and all the other pieces arranged according to their respective friezes. As detailed photographs had been taken before the Vase was dismantled, it was not difficult to locate even very small pieces. Even without the photographs, the type of pattern and the thickness and colour of each piece would have been good clues to its position.

Initially the bowl was assembled by working from the base upwards, starting with a large fragment of the whirligig pattern, to which one piece was added at a time. As the pieces were being joined it was noticed that the edges of many of the fragments in the lower half of the bowl had been filed down, presumably during the first complete restoration before the Vase was acquired by the British Museum. This was not an uncommon practice in the past, when restorers were less scrupulous

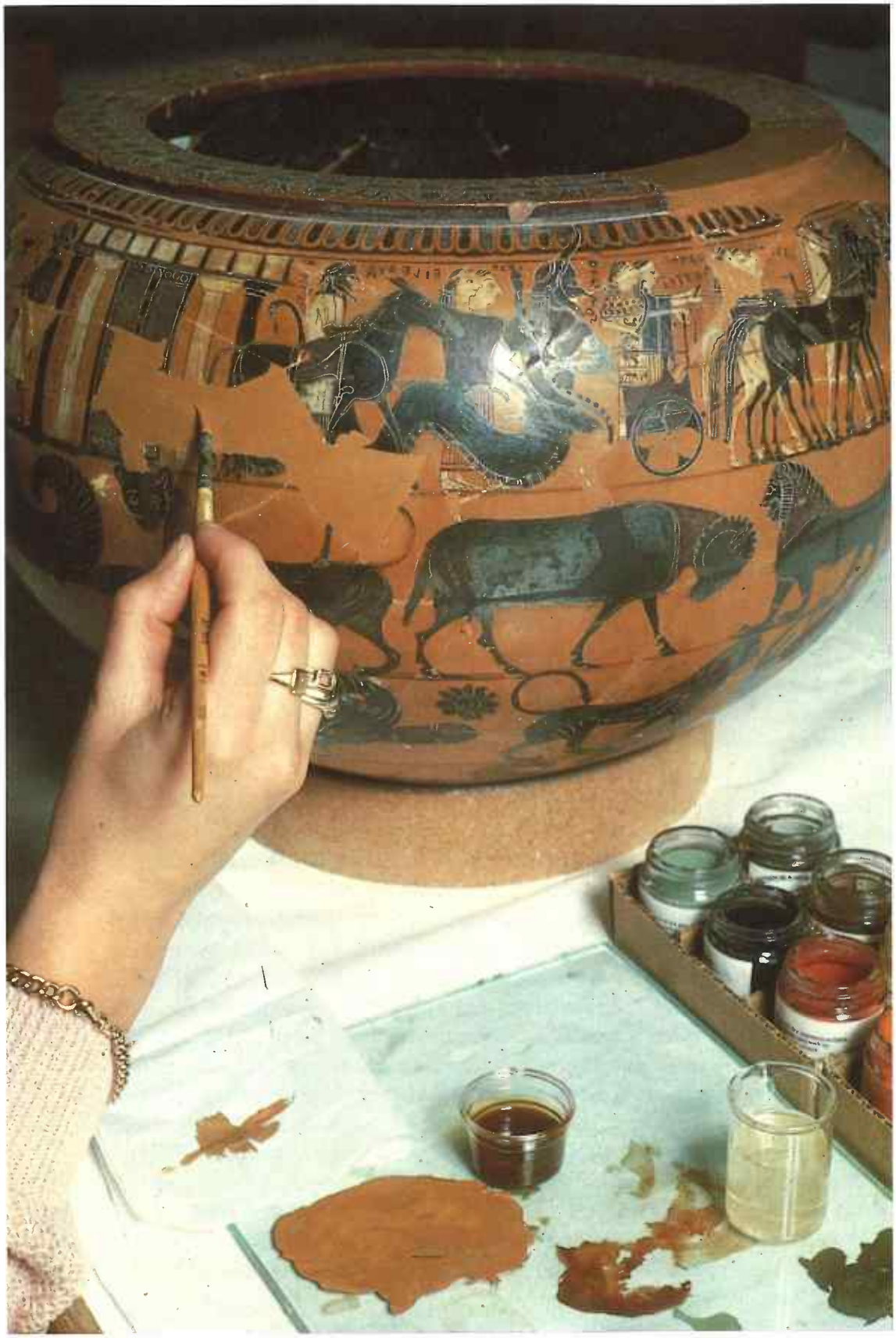
and had less sophisticated adhesives than those available to modern conservators. Two of the most popular adhesives used in the last century were animal glue and shellac, both of which are thick, sticky, brown liquids. If a vase was broken into many fragments, by the time the edges of each piece had acquired a coating of glue the pot could end up significantly larger than it was originally. The restorer might also find he could not fit all the pieces into the 'jigsaw puzzle'. One way of solving these problems was to file away the edges of the sherds to make room for the glue! In the case of the Sophilos Vase the result of this filing was that when the pieces from the upper part of the bowl came to be fitted into position, there was not enough room to accommodate them. There was no alternative but to dismantle the joins and start all over again.

This time the rim pieces were joined together first. The adhesive, a cellulose nitrate, was thinly applied along one edge of the pieces to be joined. The two pieces were carefully aligned, and held in place by strips of masking tape at right angles to the join, on both back and front. Masking tape was used because it will stretch slightly and so keep the pieces under tension. It is also easy to remove, by applying a little industrial methylated spirits. Once the adhesive had started to set, after about half an hour, more pieces could be added, and the Vase once more began to take shape. As the pieces from the lower half of the bowl were added to the upper half, the gaps left by the filed edges were spread over the whole area. Once these gaps were filled and painted, they would be less noticeable.

Eventually the bowl was back in one piece. However, the missing areas still had to be replaced. It was decided to fill these with plaster of Paris, which is light yet

154 (*Left*) A missing area being filled with plaster, showing the support made from dental wax.

155 (*Opposite*) The restored areas were retouched using bleached shellac and fine-ground dry artist's pigments.



strong – but not too strong. It is also very easy to work with and gives an excellent finish, and has been used with great success by several generations of museum conservators to restore pottery.

The first step was to make a support for the plaster out of sheets of pink dental wax. A piece of wax large enough to cover the hole was cut out and held under hot running water. This softened the wax enough to allow it to be pressed against an undamaged area of the Vase with the same profile as the missing piece. As the wax cooled, it hardened again but retained the shape of the Vase. It was then eased away, taking care not to distort its shape, and fastened in position with masking tape behind the area to be filled. Where it was not a perfect fit, minor adjustments could be made with a miniature hot air blower. Once a good seal had been achieved, the void was filled with plaster of Paris.

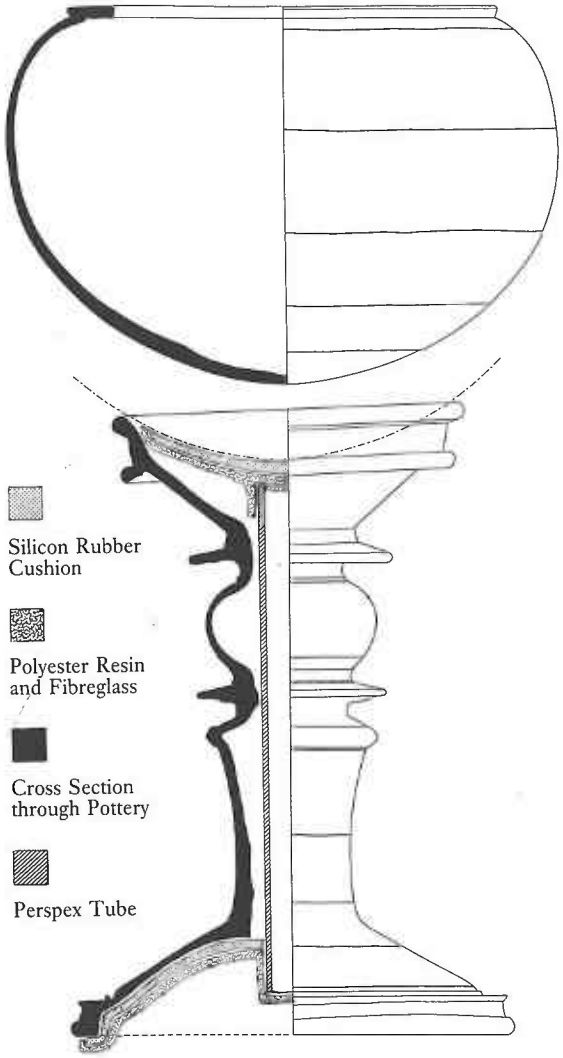
A useful characteristic of plaster is that it goes through several consistencies as it sets. Runny at first, it gradually becomes thicker until it reaches a 'cheesy' stage, when it is very easy to shape. All these stages were useful when filling the missing areas. Runny plaster was first applied to all the broken edges of the hole, to ensure that good contact was made between the fill and the pottery edge. As the plaster 154
thickened, the void was filled in until the cheesy stage was reached, at which point more detailed shaping was carried out with a metal spatula. When the plaster had just set, the shape was refined with a sharp scalpel, and any excess plaster which had spilled on to the surface of the Vase was easily removed.

All the voids were filled in this manner. When the plaster had dried completely, it was rubbed down to a very smooth finish using increasingly fine grades of garnet paper. These had to be used with great care in order to avoid damaging the fragile surface of the Vase. The paper was cut into small pieces about 2 cm (¾ in) square, and was then rolled up to give a small, easily controllable sanding area. Once the plaster fills had been smoothed to the correct shape and polished with a very fine paper, they were sealed with several coats of white shellac. Tiny air holes and imperfections remaining in the plaster surface were filled with Fine Surface Polyfilla, which was also used in the fine cracks between the joins. The plaster areas were now ready for retouching.

It was very important that the restored areas should be easily identifiable, even in photographs: perhaps another scholar on the other side of the world may one day recognise more of the missing fragments. In the previous restoration, areas of black-figure painting had been completed and inscribed lines continued, making it difficult to distinguish the restored areas from the original surface. This time the missing areas were painted a plain terracotta colour, but for the sake of continuity 155
of pattern the colours were filled in across the cracks between sherds. This allows the viewer to appreciate the beautiful design of the Vase and yet see exactly which pieces are original.

The medium used in the retouching was the same bleached shellac which had served as a sealant. This has been used in the restoration of Greek vases for over 100 years and has not yet been surpassed by a modern material. The shellac is mixed with finely ground artists' pigments, using industrial alcohol as a thinner and brush-cleaner.

Greek vases were made from a high-quality Attic clay which gives a rich terracotta



156 (*Left*) The stand before conservation, showing the warped base.

157 (*Right*) Drawing showing the profile of the bowl and stand with the mount in position.

colour when fired. When leather-hard, the surface of the clay was first burnished with a rounded agate pebble, or possibly a piece of bone or hard wood. It was then given a very thin wash of ochre to enhance the natural terracotta colour of the clay. The vase was again burnished and the black decoration applied to the polished surface. Any further colours, such as white and red, were added last of all. The palette available to the Greek potters was fairly limited, consisting mainly of white, yellow, red, pink, grey and black. These colours were mostly derived from the same clay that formed the body of the vase, with the addition of various oxides. Occasionally the range was increased by the use of additional colours which were not fired on, although these are mainly found on vases with a white ground or slip, such as *lekythoi*, used to store oils and perfumes. These were fairly fugitive mineral or vegetable colours painted on to the white ground after firing. They included shades of blue, green, yellow, pink, purple and matt black. They have by now usually completely faded, rubbed off or leached away during burial. Gold leaf is also found on some vases.

When restoring the cracks between the sherds on black-figure vases, it is impor-

158 The Sophilos Vase after conservation.

159 Detail of the Vase after reconstruction.

tant to follow the same sequence as that used by the original painter. Hence, even in the black areas the layers of terracotta colour were built up first, in order to achieve the richness and depth of the original glossy black decoration. The paint was built up layer upon layer, with a careful sanding using very fine abrasive papers between each coat. Eventually a very smooth, even colour was obtained, and the black areas of the pattern could then be filled in. Again, several layers of paint were needed, carefully sanded and burnished with a special brush made from glass-fibre bristles, to achieve the correct sheen.

The black gloss on the Sophilos Vase has a metallic quality which is in fact the result of a fault in the firing process. When it catches the light in certain directions, this effect can make any restoration look very obvious. The problem was overcome by burnishing powdered graphite into the final coat of paint.

It was originally hoped to leave the stand as it was, at least for the time being. There were not the obvious inaccuracies that were present in the bowl, and it was thought unwise to put the stand through the rigorous process of cleaning off the polyester resin if this was not necessary. However, on examination of the stand, new cracks caused by the ageing polyester resin were discovered. The stand had to support its own weight as well as the weight of the bowl, and it was obviously no

longer in a safe condition to do this. Moreover, the base of the stand had warped during manufacture so that it was in contact with the surface it was sitting on in only two places and could rock backwards and forwards with the slightest vibration. 156
These two areas were therefore supporting almost the entire weight of the Vase. The bowl was also slightly unstable on top of the stand. When newly manufactured, the stand would have been very strong and would have supported the bowl without difficulty. Two thousand five hundred years later, the fragmentary state with pieces missing was putting an unnecessary strain on the fabric. It therefore seemed sensible to make a supporting mount while the stand was being conserved.

The stand went through exactly the same conservation procedure as the bowl, and when it was back in one piece the mount was prepared. It was designed to take into account the warping of the pottery so that the base would stand flat and steady, and also to support the bowl completely independently of the stand. A cushion of silicone rubber was moulded to the shape of the underside of the stand and supported by a case of fibre-glass matting and polyester resin. A similar cushion and support were made for the bowl. The two supports were then joined together using a perspex tube 3 cm (1¼ in) in diameter, which would pass through the hollow centre of the stand. The mount, which is easy to dismantle, fits neatly inside the stand, invisibly 157
supporting the bowl.

After two years the restoration was complete. Peleus and Iris had been reunited 158
with their legs and feet, and the signature now read as fluently as it had when 159
Sophilos proudly signed his masterpiece 2,500 years ago. The Vase, complete with its custom-made mount, was returned to exhibition.

Acknowledgements

All photographs in this chapter are © The Trustees of the British Museum.

Further Reading

J. V. Noble, *The Techniques of Painted Attic Pottery*, London 1966.

A. Birchall, 'A new acquisition: an early Attic bowl with stand, signed by Sophilos', *British Museum Quarterly* 36 (1971–2), pp. 107–9.

R. M. Cook, *Greek Painted Pottery*, 2nd edn, London 1972.

D. Williams, 'Sophilos in the British Museum', *Greek Vases in the J. Paul Getty Museum* 1 (1983), pp. 9–34.

D. Williams, *Greek Vases*, London 1985.