Historic England

Conserving War Memorials

Case Study: The Replacement of Missing Bronze Elements

First and Second World Wars Memorial, Bootle, Merseyside

Summary

This case study describes the treatment undertaken to address missing bronze elements on the Grade-II listed Bootle War Memorial. This issue is unfortunately fairly common on outdoor bronzes, as elements are often cast separately and fixed in place with ferrous fixings. These fixings can fail over time, which results in the loss or theft of these vulnerable parts. It is important that informed decisions are made to arrive at a specification for treatment that is both ethical and achievable, and which ensures the future security of bronze elements on a memorial.

This guidance is intended for those designing, specifying and undertaking conservation and repair work to free standing war memorials, such as architects, building surveyors, structural engineers, project managers, contractors, craftspeople, and conservators. It will also be of interest to those responsible for making decisions, such as local authority conservation officers, custodians or volunteer groups. It also indicates where to get further help and advice.

This guidance forms part of a series of resources produced by Historic England, to coincide with the centenary of the First World War. This series covers the overall approach to caring for these memorials, as well as some of the more poorly understood technical aspects. It includes:

- guidance on how to record, repair, conserve, maintain, and protect these unique monuments for future generations: The Conservation, Repair and Management of War Memorials and Conservation and Management of War Memorial Landscapes
- short technical advice notes covering inscriptions, structural problems and repairs, and maintenance
- case studies on conservation options for specific war memorial issues
- films on technical aspects of war memorial conservation

This guidance has been written by Rupert Harris Conservation and edited by Clara Willett (Historic England).
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Front cover:
General view of the memorial after conservation work.

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1 Description and Condition

Description

The Grade-II listed Bootle War Memorial (unveiled in 1922) is constructed from Forest of Dean sandstone and comprises a twelve-sided base on two circular steps, with bronze panels bearing the names of the First World War fallen. Above this base is a triangular, concave-sided obelisk that supports a bronze figure of a mother and child. Flanking the obelisk on three sides are over life-size bronze figures of an infantry soldier, a seaman and an airman. On the stonework separating the figures are three bronze wreaths; there is also a plaque on the west side commemorating the Liverpool Escort Force who were active in the Second World War. On the wide stone balustrade either side of the steps leading to the memorial are set two bronze memorial plates carrying the names of those who died in the 1939–1945 conflict, with additional names in lead lettering surrounding the bronze plates (as shown on the front cover image).

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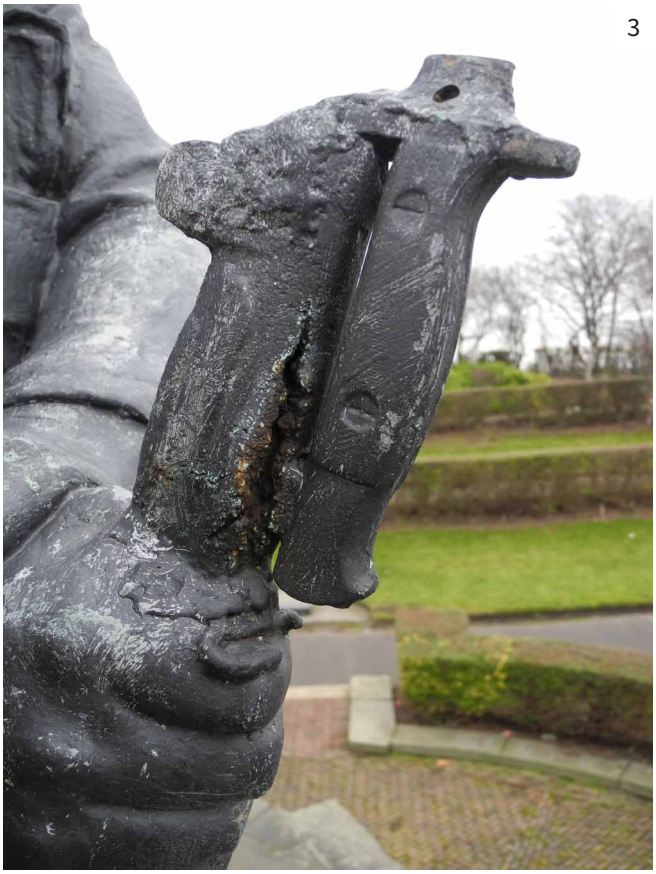
1 The Bootle War Memorial, before conservation.

Condition

Despite poor surface condition, the overall physical condition of the bronzes was generally sound. However, the inherent weakness of the ferrous metal fixings that had been used originally to attach the Seaman's bayonet blade and the Infantryman's rifle strap had allowed the theft of those elements. The strap's upper and lower sling swivels were also damaged as a result of the theft.



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2 The Seaman figure: note bayonet blade missing from the end of the rifle.

3 Detail showing bayonet blade missing from the end of the rifle.

4 The Infantryman figure: note the shoulder strap is missing from the rifle.

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2 Remedial Options

Although the overall structure of the bronze elements was generally sound, the missing and damaged elements needed to be considered.

If parts of a bronze memorial sculpture have been lost through damage or theft, an ethical decision regarding their potential replacement demands that three questions be asked:

- Would their replacement involve an acceptable level of intervention with the object?
- Does evidence exist for the original form of the lost parts?
- Does the absence of the object detract from the sculpture's integrity or meaning?

If the answer to any of those questions is 'no', then the decision may be made to stabilise the affected areas, but not to replace the missing elements. If the answer to all those questions is 'yes', then it is normally agreed that replacement of lost elements is ethical and should be carried out in order to return the sculpture to its original design. Nevertheless, it may be necessary to secure the replacement elements using additional, non-original techniques, such as the use of hidden stainless-steel fixings, to prevent the recurrence of theft.

3 Solution

Research was required to establish the original form of the missing bayonet blade and rifle strap. Archive photographs of the memorial (available online) were compared to online military records. The weapon in both cases was identified as a British Lee Enfield Mk. II rifle, and further internet research provided detailed visual evidence of the form, design and dimensions of the missing parts. Replacing them would involve a low degree of intervention with the object. Since both were important pieces of the servicemen's equipment, it was decided that the elements needed to be replaced to honour the original detailed representations of the military men memorialised.

Replacement of the Infantryman's rifle strap

The two sling swivels on the Infantryman's rifle were repaired and a new sling strap was modelled by hand from historic photographs to make a casting pattern, which was then sand-cast in bronze. The sling strap was made to follow the contour of the figure and to have an open return loop from the fore sling swivel. This was fitted to the statue by tungsten inert gas (TIG) welding, and it was then patinated to match the surrounding bronze surface, using a weak dilution of potassium sulphide, augmented with a weak solution of ferric nitrate, in order to achieve the desired colour. Heat supplied by large propane torches was used, to aid the reaction of the chemicals. The bronze surface was then warmed again to drive off any residual moisture in the patina layer. The bronzes were then waxed with microcrystalline wax, using the 'hot wax' process to ensure the wax coating was fully absorbed into the porous patina coating.

5 The Infantryman's new bronze strap attached to the rifle.

6 The new strap after patination and waxing.


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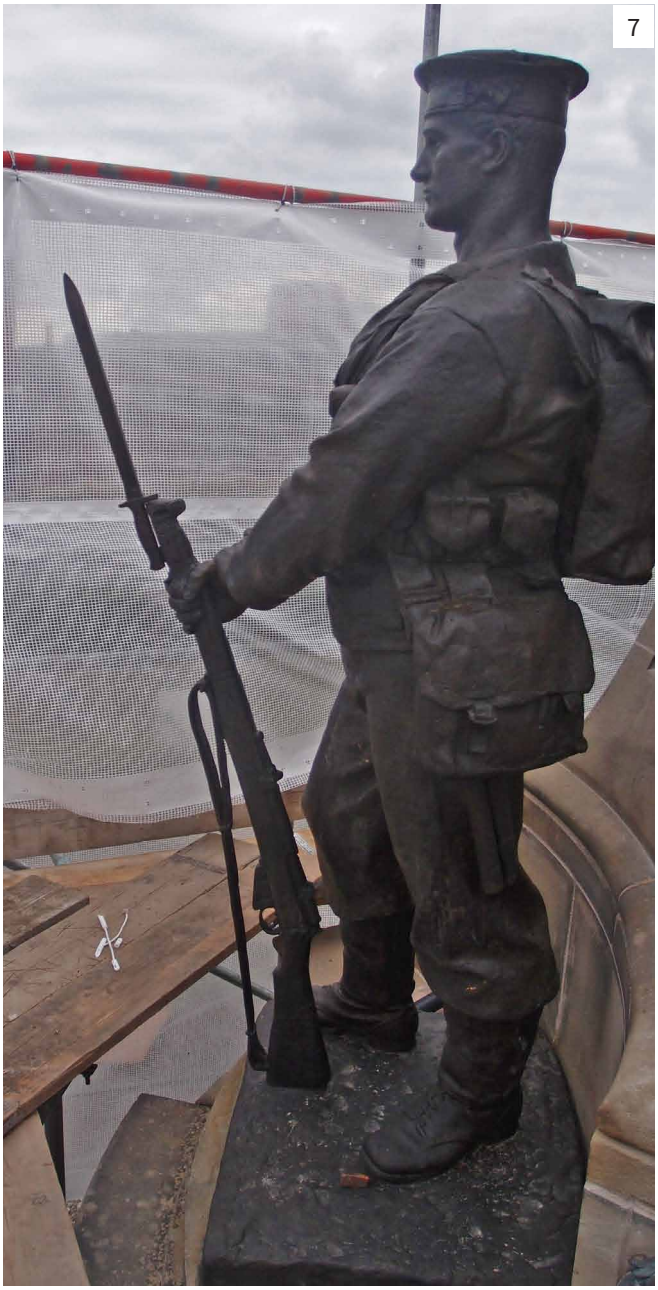
Replacement of the bayonet from the Seaman's rifle

There was fracture damage and rust splitting in and around the bayonet handle. This required cleaning out and re-welding to fully repair the damage and to ensure that the socket into which the bayonet blade would fit was sound.

As the bayonet blade had been stolen in the past it was decided that this element was still vulnerable to theft, and so should be removable, so that it could be held for safekeeping and installed for ceremonial occasions. The bayonet handle was carefully cut off the gun, to enable it to be attached to a new blade at the workshop. A wooden pattern matching the correct form for the bayonet blade used on this rifle was made. This was used to sand-cast a replacement blade in bronze, which was welded onto the original bayonet handle. Both elements were patinated and waxed, using the same materials and techniques as for the rifle strap, to match the surrounding bronze surface of the statue. Pin and slot fixings were engineered in bronze to allow the bayonet to be correctly positioned onto the statue's rifle, with the joints invisible from the ground. A small bronze 'cap' was also engineered to finish and seal the rifle when the bayonet blade is not fitted.



7 The Seaman's new bayonet blade, after patination and waxing.

4 Lessons Learnt

Post-project reflections are useful for learning what could be done differently in the future. The nature of conservation often means that unforeseen dilemmas and situations arise and even the best planned projects require flexibility and adaptation to resolve them to produce appropriate outcomes.

Prevention

Occurrence of theft or loss of parts is far better prevented than rectified. Careful and regular monitoring is essential. If loose or vulnerable parts are identified, immediate action should be taken to prevent their loss, under the advice of a qualified metals conservator.

Elements likely to suffer repeated attacks or attempts at theft may require imaginative but ethical solutions to avoid further damage. Security issues surrounding the fixings of bronze elements are of particular importance, as original fixings were often not designed to withstand theft, as this was generally not a problem when the monuments were first erected. In addition, original fixings can suffer from corrosion resulting in inherent weakness, which may not be apparent without careful investigation.

5 Acknowledgements

Project Team

Client: Sefton Council

Architect: Ian Bright Architects

Principal Contractor: Maysand Ltd

Metals Conservator: Rupert Harris Conservation Ltd

Costs: Modelling, moulding and casting processes involved in replacing lost elements are very labour-intensive crafts and this, coupled with the high price of metal, makes the cost of making replacement parts high. Such replacements must therefore be carefully costed at the budget estimate stage, so that the project funding is sufficient to cover all stages of this work.

Images

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