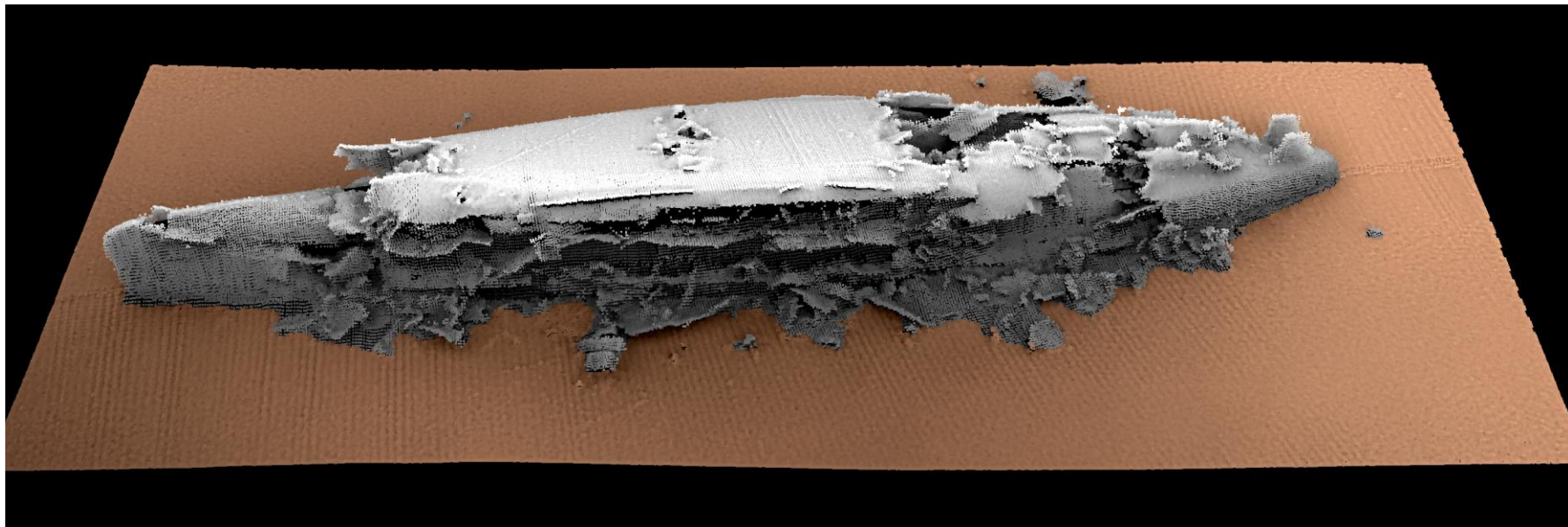


# SMS MARKGRAF



3D Artefacts from the wreck



HISTORIC  
ENVIRONMENT  
SCOTLAND

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EACHDRAIDHEIL  
ALBA

## Introduction

The harbour of Scapa Flow, Orkney has played an important role in the naval history of two world wars.

As a condition of the Armistice, which ended the First World War, 74 ships of the German Imperial Navy were handed over until a peace treaty was agreed.

In November 1918, one week after being met by the Grand Fleet in the North Sea, the German Imperial Navy's High Seas Fleet was interned in Scapa Flow. By January 1919, 74 German ships, including its ten best battleships and all six battle cruisers, lay at anchor around the island of Cava. Crews were gradually repatriated until only a skeleton crew of 1700 remained.

On hearing the terms of the Treaty of Versailles, which allowed peacetime Germany a small navy only comprising six battleships and no submarines, with the rest of the fleet to be distributed amongst Allied nations, Admiral Ludwig von Reuter, commander of the interned fleet, gave the order to scuttle the ships. On 21 June 1919, he ordered his fleet captains and their skeleton crews to scuttle their ships. The flagship, *Friedrich der Grosse*, was the first to sink. By late afternoon 51 more ships had sunk to the seabed. The rest were either beached or run aground.

Between 1923 and 1939, Scapa Flow became the scene of one of the most outstanding marine salvage feats of all time. Thanks to the ingenuity and tenacity of salvage pioneers like Ernest Cox and Thomas Mackenzie, almost all of the wrecks were raised and towed south to the Firth of Forth. With the price of scrap iron booming as the Second World War neared, they were broken up at Rosyth. After the Second World War, some salvage of the High Seas Fleet for armoured plating continued until 1979.

Only seven large German High Seas Fleet warship wrecks remain in Scapa Flow, lying on the seabed at varying depths in the 20-45m range, northeast and northwest of the island of Cava. The wrecks comprise three battleships, *König*, *Kronprinz Wilhelm* and *Markgraf*, three light cruisers, *Dresden*, *Karlsruhe*, *Cöln*, and the smaller fast minelaying cruiser, *Brummer*.

They are legally protected today as scheduled monuments under the Ancient Monuments and Archaeological Areas Act 1979. This means that the many thousands of divers who visit Scapa Flow every year can continue to enjoy diving on the wrecks, and taking photos and video. However, scheduled monument consent from Historic Environment Scotland is required to carry out works, including excavation or recovery of artefacts.

### **Illegal recovery of artefacts**

In December 2016, two scuba divers were convicted of an offence under the Ancient Monuments and Archaeological Areas Act 1979, and fined a total of £36,000 for the unauthorised recovery of artefacts from these wrecks.

A number of items were taken from the mid-ship area of the *Markgraf*, including a ship's telephone, a breast microphone, a ship's bell, a steam pressure gauge and a number of lanterns.

The artefacts were brought to the surface without provision for their conservation. Once exposed to air and moisture, many of them began an accelerated process of decay. Conservation measures undertaken by Historic Environment Scotland have helped to stabilise the objects and promote their longer term survival. However, ongoing issues are likely for many of the artefacts, due to the composite nature of the materials involved, and their complex conservation needs.

The 3DVisLab, University of Dundee has undertaken detailed 3D scans and photogrammetric recording of the artefacts, to provide a permanent record of them whilst they remain in a reasonable condition.

The artefacts will soon be returned permanently to Orkney, under the care of Orkney Museums.

The public can find out more about the wrecks and the fascinating wartime history of Scapa Flow through exhibitions at Lyness on Hoy and in Stromness Museum.

### **Augmented Reality Viewer**

In the lead up to the centenary of the Scuttling of the High Seas Fleet, there is a renewed interest in the surviving wrecks and their protection. To enable as wide an audience as possible to view the artefacts, and the conservation issues they now face, The University of Dundee and Historic Environment Scotland have created a unique Augmented Reality 'virtual museum', allowing anyone with a smartphone or tablet to view the artefacts in incredible detail.

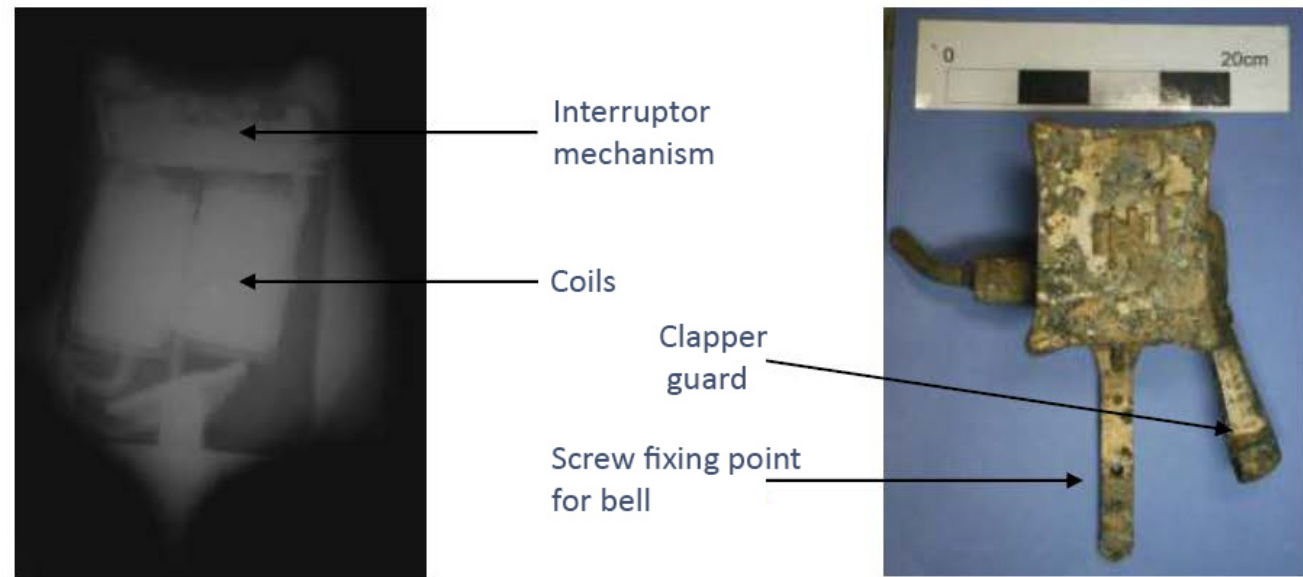
### Description

This object is a brass/alloy ship's electric bell. The bell cover is missing but would have been mounted on the vertical upright (through the threaded hole).

An x-ray of the bell shows the remains of its internal workings. The interruptor mechanism and coils can be clearly seen. The clapper would have come out of the angled section and this piece is almost certainly to guard the clapper.

The bell would have been used in association with a telephone unit or other alarm systems in noisy environments such as the engine and boiler room.

Plans of the telephone system on *SMS König*, a sister ship to the *Markgraf*, confirm that four telephones were installed with separate bells - one in each of the three boiler rooms and one in the engine room



### Condition

When originally recovered, the bell was covered in products of iron corrosion and appears to have been partially buried in iron-rich sediment. These ferrous corrosion products probably originate from corroding structures within the hull of *SMS Markgraf*.

Although the exterior of the bell is in a relatively stable condition, the mechanical components in the interior have not been stabilised and are likely to be deteriorating due to their exposure to air. Many of the internal components have now become detached and are loose within the casing.



### Description

This breast microphone was manufactured by the German company Mix and Genest. It would have been used along with a headset and base unit. A leather strap would have been affixed to the two mounting points at the top, and the strap placed over the shoulders so the microphone hung on the chest. The leather mouthpiece would collect the sound.

The switch plate has three positions – ‘*Aus*’ – meaning ‘off’, ‘*Sprechen*’ meaning ‘speak’ and 12 Volt – the on/listening position. The switch was found in the ‘*sprechen*’ position.

Breast microphones provided a more portable means of communication than wall-mounted telephones. Their use became more common in the later years of the First World War. Plans for the *SMS Karlsruhe*, which was commissioned later in the war, show 42 separate connection points for headsets associated with breast microphones.



### Condition

The breast microphone is a composite object. The external casing is made from brass, the mouthpiece leather. Internally, there are likely to be a mixture of materials within the electrical workings. Composite objects are particularly challenging to conserve as the preferred treatment for one component might be harmful to the others.

After desalination, the leather component of this object has been consolidated with polyethylene glycol (PEG) 300 prior to being allowed to dry.

Whilst the brass casing remains relatively stable, the item is no longer a sealed unit and the backplate has begun to displace. This is likely due to corrosion of ferrous material from the interior workings. The metal elements of this item require storage in a low moisture environment in order to slow down the rate of corrosion.



## Description

Three of the Ship's bulkhead lanterns were recovered. They are brass in construction and originally would have glass panels surrounding the lighting element.

Two of the lanterns have the German Imperial Crown stamped on the back

## Condition

The lanterns vary in condition with two of them retaining evidence of glass panels.

One also has fabric adhering to the front.



