

A royal refugee

HOW 21ST CENTURY SCIENCE CAME TO THE AID OF A 16TH CENTURY BC EXILE

Too delicate to be moved, the ancient statue of a Syrian-born king is kept behind glass at the British Museum. Now, thanks to innovative technology, his extraordinary story will reach audiences beyond the confines of the museum gallery, to help fellow refugees fleeing conflict in Syria today.

Fearing for his life, a youth called Idrimi, the youngest of seven brothers, escaped Aleppo in Syria and fled with his family to the safety of his mother's hometown Emar, further to the north on the Euphrates River. That was 3,500 years ago (see box opposite).

We know about Idrimi because his story is carved in cuneiform on his kingly statue, which was discovered in 1939 by Leonard Woolley while excavating at Tell Atchana (ancient Alalakh). Woolley sent it to the British Museum, where it has remained safely ensconced in a glass case. This was where Jessica Pocock came across it, while visiting gallery 57 with the Syrian archaeologist and sculpture Zahed Taj-Eddin. Like Idrimi, Zahed hails from Aleppo. It gave Jessica an idea.

Jessica is the sister of John Cantlie, the British journalist and photographer kidnapped along with US journalist James Foley by so-called Islamic State in 2012. James was murdered by IS. John remains in captivity. Unable to help her brother, Jessica instead established a charity to reach out to those for whom she could make a difference. Making Light sets out to, in her words, 'seek out stories beyond the darkness of terrible headlines and war: stories that help us see the threads that connect us – both as individuals and

as cultures, past and present.' And it was clear that the extraordinary-looking statue of King Idrimi, a 16th century BC Syrian refugee who overcame great odds, would be a powerful symbol to highlight the plight of Syrian refugees today – and a spectacular figurehead for Making Light's planned exhibition *Syria Past and Present*.

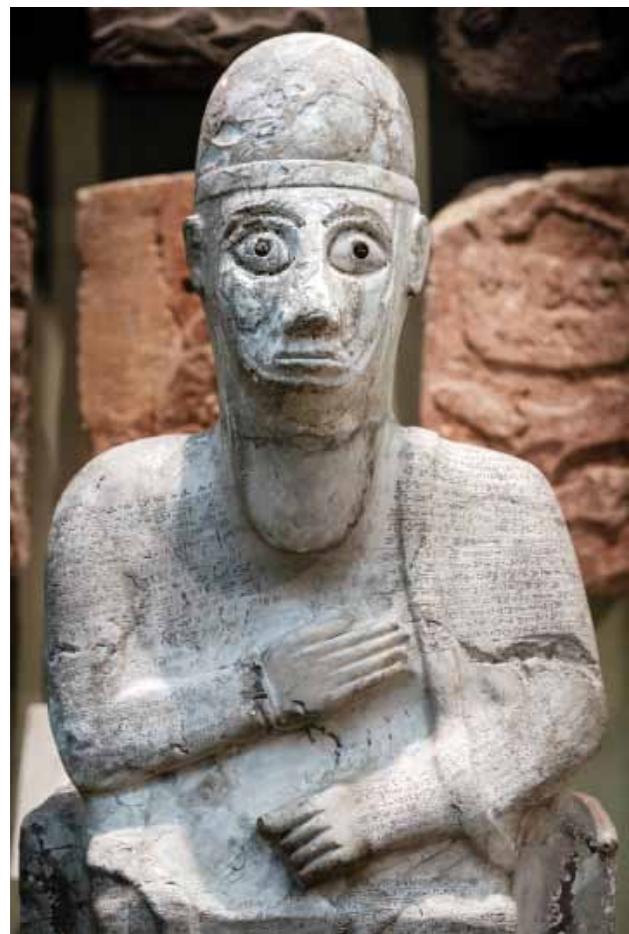
However, the stone statue is fragile, and certainly would not withstand the rigours of travel. Jamie Fraser – then curator at the British Museum, now senior curator at Sydney University Museums – told CWA: 'Unlike the hard basalt of the throne on which it sits, the figure is made of magnesite, which is lighter in colour but also more fragile – and probably chosen because it would have been easier to carve the cuneiform inscription.'

So, Jessica contacted Adam Lowe of Factum Arte, the innovative Madrid based company that has developed a world-wide reputation for recording endangered heritage and producing exact facsimiles (see CWA 73). Adam responded immediately, offering to donate expertise and equipment free of charge.

Creating Idrimi's twin

Jamie co-ordinated the project, ensuring Idrimi was carefully removed from the security of his glass cabinet. Then, for two days, the team from Factum Foundation,

RIGHT The cuneiform text was carved by his scribe Sharruwa. The magnesite statue with glass eyes sits on a basalt throne that probably once had sphinx wings on either side. It was found, decapitated and next to a magnesite bowl, by Leonard Woolley in 1939 at Tell Atchana (ancient Alalakh).



the charitable arm of Factum Arte, set up camp in the museum gallery to digitally record the statue.

Two separate processes were used, primarily to ensure the quality and accuracy of measurements required to produce an exact replica of the original statue down to the tiniest detail, but also to assess both methods in terms of potential costs.

The first 3D recording method involved a structured light 3D scanner, or white light scanner. This projected patterns onto the surface of the statue, which were then recorded by two cameras. The distortions of the pattern caused by the statue's form taken in conjunction with trigonometric calculations provide highly accurate information about the surface of the artefact. The scanners had to be repositioned at several different points around the statue to ensure the entire surface area was covered, and these areas were then aligned and merged to create a complete model.

The second method the Factum team used involved close-range photogrammetry. About 2,500 colour photographs were taken of the statue from every angle at close range, and aligned using new processing software, called Reality Capture, to generate a high-resolution 3D model, transferring the large number of images required to ensure

KING IDRIMI'S TALE

Following a 'hostile incident' against his father in Aleppo, Idrimi and his family escaped to the safety of Emar, his mother's hometown on the Euphrates in northern Syria. While his six brothers were happy to stay, Idrimi grew discontent. He moved south to the Land of Canaan (believed to be southern Lebanon) where he met up with fellow refugees from Aleppo and neighbouring lands. Together they formed an army, with Idrimi as their leader. For six years, Idrimi made sacrifices and gave offerings to the storm god Teshub for help, and finally, in the seventh year, he led his army in battle against the Hittites. He conquered Alalakh, about 80km west of his birth town of Aleppo, was crowned its king, and reigned there for 30 years.

For more on Idrimi, see Object Lesson CWA 79.



minutely detailed information in just a few hours. This method relies on getting as close to the artefact as possible, to record the smallest details at as high a resolution as possible (in this case 8000 by 7000 pixels per image), but it is a cheaper alternative to expensive 3D recording systems.

The data was then fed into a CNC routing machine, best described as a spinning sharp metal tool that is mounted on a three-axis linear guide computer-controlled machine that reads the 3D data and generates a cutting path. This path tells the spinning tool where to physically engrave a hard material – in this case resin.

What was particularly interesting was that in terms of size, the photogrammetry model was as accurate as the structured light model – to within 200 microns. This means that at worst, the surface of one model does not differ by more than 0.2mm from the other.

With regard to surface detail, the results were even better. On screen, both appear similar but once applied to hard resin, the data from the photogrammetry model showed greater sharpness than that from the – more costly – structured light scanner.

This has exciting implications for heritage around the world, as Adam explains: 'We have shown that photogrammetry can be better than expensive 3D scanning systems, which is really significant in the protection of cultural heritage at risk. It may take longer, but it can be done without very expensive hardware and software.'

Powerful message

Though the replica will be made of stronger material than the fragile magnesite of the 16th century BC statue, once decorated it will be indistinguishable from the original. So while Idrimi remains safe in his glass cabinet, his twin will be a valuable resource for study by scholars in the future.

Idrimi's statue has a further quirk. The story of his life ends with a curse on any who would desecrate his statue. Such threats are not unusual. However, what is unique, is the cuneiform text inscribed on Idrimi's right cheek – which Jamie describes as 'a bit like a cartoon speech bubble coming from his mouth'. This records that Idrimi wrote his deeds for everyone to see, and asks those that learn from his life to bless him forever.

'This strange looking sculpture is highly significant,' explains Jamie. 'The stone is unusual, the style is unusual, the inscription is unique. The whole thing is very singular, and speaks to an interesting moment in time when there was a lot of transition in northern Syria/southern Turkey, allowing new expressions and experimentation to happen before the new empires come in a few hundred years later. So, in many ways, what it represents still has significance for that region today.'

Now, thanks to this project, more people will learn of his life than Idrimi could ever have hope for – and perhaps, suggests Jamie, what he was really hoping for with this blessing all along. And it is his message of fortitude that Jessica hopes to convey in the exhibition to be held next year: 'The statue of Idrimi is an intensely powerful image. He sits with his hand on his heart and his eyes looking out towards the horizon. His resilience reflects the resilience of humankind, and especially the Syrians today. He shows us that they, whoever 'they' are, may kill us as individuals, but they can't kill hope or humanity.' ■

FURTHER INFORMATION

For more on the work of Making Light, the exhibition *Syria Past and Present*, and the charity's *Syrian Voices* project, visit : www.makinglight.org.uk



ABOVE, FROM TOP A team from the Factum Foundation digitally record the statue in Gallery 57 of the British Museum.

The zebra stripes of the structured light scanner. Using photogrammetry to record the statue. The unique cuneiform blessing inscribed on the cheek of King Idrimi.

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