

The Ida Palmyra Arch copy

Adam Lowe, 2016

On the 19th April 2016, the Institute for Digital Archaeology (IDA), with Mayor of London Boris Johnson, unveiled their replica of the Triumphal Arch at Palmyra in Trafalgar Square. There had been much anticipation and build-up to the event among the press. The press releases all claimed that this replica of the arch had been milled from Egyptian marble and was an exact reproduction of the Triumphal Arch. In fact, the central arch has been removed from its context (it is one of three that make up the Triumphal Arch structure in Palmyra) and is about one third the size of the original, in a uniform yellowish material and roughly modelled from photographs. It seems the Institute of Digital Archaeology has been overstating its aims and abilities. Do their claims stand scrutiny?



Photograph of the original, towering over people passing under

"I think that this may be the most exact reproduction of any kind of classical structure ever made. It got to the point where we were trying to decide whether to include cobwebs, bird's nests, moss that was on the structure [...] The idea would be to install 3D printing grids on a site near to Palmyra, to use the same cutting tool technology on location in Palmyra which will provide jobs for local people." (Roger Michel, speaking on the BBC on 19/4/2016)

A cursory comparison between the original and the replica confirms that this is an approximate copy and not a facsimile or replica. Cobwebs and bird's nests seem to be far from their biggest worry with regards to accuracy. The more detailed photograph below demonstrates that their copy doesn't match the original in terms of detail, decoration and colour let alone scale.



Photograph of the copy; note the size of the people in comparison to the arch.



The back of the IDA copy. Note the uniformity of colour and texture; the bricks all fused together and smoothed, looking like bars of soap. Many of the specific details do not correspond to the original central arch.



The back of the original. Note the texture and colour variants of the stones at the top of the arch.

What Material was used? Was it carved in stone with a CNC robot or printed from a composite resin? The IDA press release said the replica had been milled from several blocks of Egyptian marble. Boris Johnson, in his column for the Daily Telegraph, said: *"It will not be perfect. It will not be made of the same pinkish-golden stone of that original temple gateway, which ISIS has blown to atoms. It will be made of resin."* (Boris Johnson, *The Telegraph*, 27 March 2016)

The claim that the arch is made from Egyptian marble seems to be at odds with other statements and claims made by Roger Michel about IDA's method. Simon Jenkins of the Guardian, writes: *"Michel claims his printers can reproduce not just the texture and surface contour of stone, but its physical makeup. They can extrude layers of the same sand, water and sodium bicarbonate that formed the artificial stone often used by the ancients. They can reconstitute the original dust of a ruin in situ. It is no different in concept from the French Archaeologists who, in the last century, re-erected Palmyra's colonnade."* (Simon Jenkins, *The Guardian*, 29/3/2016)

More recently the idea of milling into Egyptian marble in Italy seems to be the preferred method: *"The decision to build it in Egyptian marble - which they claim will be close to the original in appearance - was also a late one. But an arch here or there is barely the half of it. Michel says he is 'in discussions right now with folks in Aleppo about reconstructing the minaret of the mosque there'."* (Nigel Richardson, *The Telegraph*, 18 April 2016)

Digital Restoration is one of the most important emerging subjects - separating the task of preservation from that of restoration. In Michel's publicity seeking statements he seems intent not only on blurring the distinction between printing and carving, but the suggestion that the Minaret in Aleppo can be made this way is both misleading and fanciful.

The Decorative Detail

While there may be confusion over the materials and the scale there is no confusion about the details on the arch. The stonework has been simplified but the capitals have entirely lost their sense and meaning.



The top of the replica. The Corinthian column looking more akin to fish scales or feathers. They are clearly not Acanthus leaves nor based on the language of this form or order of classical decoration.



Image of a section of the original. Compare the detail on capital in the top left, above, with the one on the replica below (red square). Compare with photo of the replica below (blue square): notice the detail on the capital and the fact that large parts of the copy do not correspond with the design, proportion or detail of the arch.
Photograph by Daniel Demeter for Syriaphotoguide.com



Photo of installation. The blue square, corresponding to the blue square in the previous photo of the original. Notice the lack of detail on the capital, and what is effectively made-up information on the border.

*[The decorative features] are, says Michel, "completely indistinguishable from the original". He is also offering the Syrians two printers that, he claims can operate at a speed that "should enable us to rebuild what has been destroyed inside six months". (Simon Jenkins, *The Guardian*, 29/3/2016)*

Not only is it easy to demonstrate that this copy is quite clearly distinguishable from the original, but Michel's claim about rebuilding Palmyra is both misleading and irresponsible. Fortunately the destruction in Palmyra was not as bad as some feared. In the days after the site was recaptured, Iconem (a French 'not for profit' team) carried out aerial photogrammetry of the site and high-resolution photogrammetry of some of the details. This is exactly the work that should be supported. It cost a fraction of the budget for IDA's arch and will allow CNC milling or 3D printing at meaningful levels of accuracy. If this work had been done before the ISIS destruction it would have would have been even more meaningful.

3D printing and re-materialisation technologies are developing fast. When digital skills are merged with artisanal craft skills a great deal can be achieved - but this work is slow, expensive and dependent on scholarship and knowledge. While a reduced size low resolution arch with very little detail can be made in 30 days using a CNC router or a 3D printer it has no meaning or function in preservation or restoration. The claim that two CNC routing systems can rebuild Palmyra in six months is factually wrong.

The debate over whether Palmyra should be rebuilt at all need to take place publicly and in a considered way. The argument given by the IDA (which was used to justify its unveiling in

London), is that London was rebuilt after the blitz. It brings to mind Aleppo - this great city has been reduced to rubble. At the end of the conflict and before the city is rebuilt, it will be a vast archaeological site in need of emergency archaeology. Politicians should be focusing on this and providing the money to make it happen. London was rebuilt but not as it was before the Blitz. *"Trafalgar Square, then, is the display case, and the arch within it 'proof of our competency to do these things' [Roger Michel]."* (Nigel Richardson, *The Telegraph*, 18 April 2016)

Sadly this simplistic publicity seeking exercise has proved the reverse. What is worse is it has done it using the names of Oxford and Harvard Universities to give it academic credibility. It is hoped that both Oxford and Harvard will distance themselves from this theme park approach and promote an understanding of the role of digital preservation that will help to protect the past. It should be noted that other universities are already starting to do this in ways that will advance the subject.



IDA mock-up of what it would look like (interestingly much more detailed than the replica).

What the media has said since the arch was erected:

The IDA Arch has been receiving some critical responses from different media outlets, including: *"It is too early to say if "critical reconstruction" is an appropriate approach at Palmyra but shipping an Italian/Egyptian copy of an arch to Syria that does not incorporate either original material or reveal in its design something of the trauma of the attack upon it simply cannot be right."* (Robert Bevan, *Evening Standard*, 25 April 2016)

"The marble is smooth, bright and plasticky; it looks as much like a Roman ruin as the Disneyland castle looks like an actual medieval fortress. [...]"But putting [the arch] in London seems a little smug, not to mention hypocritical. The message is that Iraqis and Syrians can't be trusted to take care of their own artefacts, that we in the west are still the guardians of universal culture. In other words, it's a form of looting - we've stolen a piece of Syrian history, copied it and tried to make it our own." (Sam Kriss, *Vice*, 25 April 2016)

"The publicity stunt has not been without controversy. It is costing a reported £2.5m and some archaeologists believe the money could have been better spent on Syria's existing monuments." (Edwin Heathcote, *The Financial Times*, 19 April 2016)

Cost:

It has been reported that the replica cost between £100,000 to create (Lauren Turner, *BBC News*, 19/4/2016) and 2.5 million (Edwin Heathcote, *The Financial Times*, 19 April 2016). The true cost of producing a set design like this can be obtained from the Royal Opera House whose skilled craftsmen can do it fast and effectively.

Factum Arte has years of experience of making exact facsimiles and working with both 3D printing and CNC milling. We also have some very skilled digital modellers. The test below was modelled by Irene Gaume in Madrid from photographs obtained over the internet. The modelling from start to finish took about 200 hours. The milling took about 150 hours. The costs of this can be easily calculated - At a 'special rate', skilled 3D modelling will cost at least 60 euros an hour. Milling costs about the same. The section shown here is a 63 x 59.5 cm routing of details on the Arch of the Temple of Bel in Palmyra. The 3D data was hand-modelled from photographs.



Image of the routed section of the arch of the Temple of Bel in Palmyra routed into high density polyurethane.



Section of the 3D model from which the routed section was made.
The 3D modelling was based on freely available photographs.

Facsimiles

When high-resolution 3D documentation and re-materialisation is done correctly, it creates opportunities in the academic, economic and cultural spheres. Factum Foundation's facsimile of Tutankhamun's burial chamber in the Valley of the Kings, Egypt, serves as a strong example. In 2009, Factum Foundation and Factum Arte used high-resolution 3D scanning and composite photography to document the entire surface of Tutankhamun's burial chamber. The purpose of this work was to communicate to the 7,000 tourists a day who visited the Valley of the Kings the problems of protecting and preserving sites that were built to last for eternity but never to be visited. Mass tourism is a significant but destructive force for cultural heritage. It brings income into communities that are desperately in need, but there is an urgent need to get the visitors to understand how to make tourism sustainable. The production of the exact facsimile of Tutankhamun both provided the data to monitor decay, produced a didactic experience linking heritage and technology and provided jobs in the local community.

It has been installed next to Howard Carter's House at the entrance to the Valley of the Kings as part of the Theban Necropolis Preservation Initiative. This project is being run by the Ministry of Antiquities, Basel University and Factum Foundation - you can follow its progress [here](#).



Facsimile of the Tomb of Tutankhamun

The facsimile of the Tomb of Tutankhamun also serves as the inaugural project of a multi-year outreach program in Luxor; the Theban Necropolis Preservation Initiative is designed to offer training and capacity building in cultural preservation for the Egyptian communities. The Initiative is a sustainable system in which the tombs of the Valley of the Kings will be preserved and studied on site, by local custodians with advanced digital and artisanal skills.

Factum Foundation's mission to raise awareness about precise 3D documentation and re-materialisation of cultural heritage has never been more relevant or imperative. For the Foundation, a facsimile is a testament to the quality of the data and to a highly developed approach to digital printing (in 3D and colour) and other re-materialisation technologies.