





RE-CREATING THE LOST SILVER MAP OF AL-IDRISI

ENTERTAINMENT FOR HE WHO LONGS TO TRAVEL THE WORLD

In 1154 the Muslim scholar Al-Sharīf al-Idrīsī compiled a geographical compendium for the Norman ruler of Sicily, King Roger II, entitled the *Entertainment for He who Longs to Travel the World* (*Nuzhat al-mushtāq fi'khtirāq al-āfāq*). The *Entertainment* contained seventy regional maps of the known world, as well as a world map that represented the most technically sophisticated mapmaking of its time. Drawing on classical Graeco-Roman learning and Islamic geography, combined with accounts of contemporary travellers, Idrisi used his geographical data to make a single round map engraved onto a silver disk and set into a wooden table, with the Arabian peninsula and Mecca at its centre.

The silver disk is now lost, and the *Entertainment* survives only in the form of later manuscript copies. In a groundbreaking project, Factum Foundation has teamed up with the Bodleian Library, the cartographic historian Professor Jerry Brotton, and Daniel Crouch Rare Books to re-create al-Idrīsī's fabled silver disk from an Ottoman copy of the *Entertainment* held in the Bodleian Library, Oxford. Neither facsimile nor copy, this re-creation combines painstaking historical research with advanced digital techniques and the highest levels of craftsmanship. It pays tribute to the lost original, offering yet another layer to its complex and unique history, and generating new research into one of the greatest of all Muslim mapmakers.

AL-IDRISI AND ROGER II: MAPPING THE WORLD IN THE TWELFTH CENTURY

A descendent of the prophet Mohammed via the powerful Shi'a Idrisid dynasty, Abu Abdullah Muhammad ibn Muhammad ibn Abdallah ibn Idris al-Sharif al-Idrisi, also known as Geographus Nubiensis in Western Europe, was probably born in Ceuta in 1100. As a young man al-Sharif al-Idrisi attended the famous University in Córdoba, and over the course of his life travelled widely around a Mediterranean divided between competing Christian and Muslim powers. Around 1138 he arrived at the Sicilian court of the Norman king Roger II. The Normans had conquered the Arab Emirate of Sicily in the final decades of the 11th century, and Roger ruled over a linguistically and culturally diverse kingdom: Muslim craftsmen were commissioned to produce art and architecture for the court at Palermo, and scholars worked in the highest echelons of Roger's bureaucratic structures inherited from its Arab heritage.

King Roger was profoundly interested in ancient cartography. He studied Arabic and Greco-Latin maps, and is believed to be the first Christian king to have examined Ptolemy's *Geography* (c150 CE). After years of study, however, he realised that ancient sources were rather "obscure" and "unsatisfactory."¹ Because of this, he sought to produce the most accurate map ever done, including detailed descriptions of all regions of the world. According to some contemporary sources, he sent for al-Idrisi for this task, offering him the "salary of a prince and protection" in exchange for his work.² Medieval sources claimed that al-Idrisi was preferred by Roger to all others, to such an extent that the rumour arose that the ruler was going to convert to Islam. The scholar al-Safadi (1297-1362), for instance, stated:

1 Hubert Houben, *Roger II of Sicily: A Ruler Between East and West* (Cambridge University Press, 2002), p. 103.

2 Al-Safadi, BAS II.564-5; Arabic text corrected by Oman (1970), 218-2019, 229.



Image

Map of Sicily from the *Entertainment for He who Longs to Travel the World* (north is at the bottom of the page) © Factum Foundation

“Roger loved learned men of philosophy, and it was he who had al-Sharif al-Idrisi brought to him from North Africa. (...) When he arrived Roger welcomed his guest ceremoniously, making every effort to do him honour”.³

And then added:

“Al-Idrisi sought from him the metal to build the device he had planned. Roger had silver with a weight of 400 000 drams brought to him, and with this silver al-Idrisi made spheres like those in the heavens. He then placed them one upon the other, setting them up in a particular way. Roger was full of admiration. For this he had used only a little more than a third of the silver, but the king let him keep the rest as a reward.”⁴

With Roger as his patron, Idrisi started work, together with a team of scholars, on the definitive world map of the age. In order to ensure its accuracy, 15 years were spent examining existing maps and interviewing travellers, and al-Idrisi drew on three centuries of Islamic mapmaking knowledge largely

unknown to Christian cosmographers, including the Hellenic geographer Claudius Ptolemaeus (c150 CE), whose *Geography* was known to him in Greek, Latin and Arabic translation. According to Ptolemaic principles, Idrisi divided the world into seven longitudinal climate zones.

Idrisi calculated that the earth had a circumference of 23,000 miles – not far removed from the actual figure of 24,901 miles. The spherical earth, he wrote, hangs “stable in space like the yoke of an egg”. His map inverts our conventional ordering of north and south, placing south at the top of the image, and following the 10th century geographer Ibn Hawqal he locates Mecca at the centre of the world.

Once the silver disk was complete, Idrisi set to work on a book of 69 regional maps, “explaining how the form [of the silver disk] was arrived at, adding whatever they had missed as to the conditions of the lands and the countries”. This book was the *Nuzhat al-mushtāq fi’khtirāq al-āfāq*, or the *Entertainment for those wanting to discover the world* (also translated as *Entertainment for those wishing to penetrate horizons*),

³ Al-Safadi, BAS II.564-5; Arabic text corrected by Oman (1970), 218-2019, 229.

⁴ Al-Safadi, BAS II.564-5; Arabic text corrected by Oman (1970), 218-2019, 229.

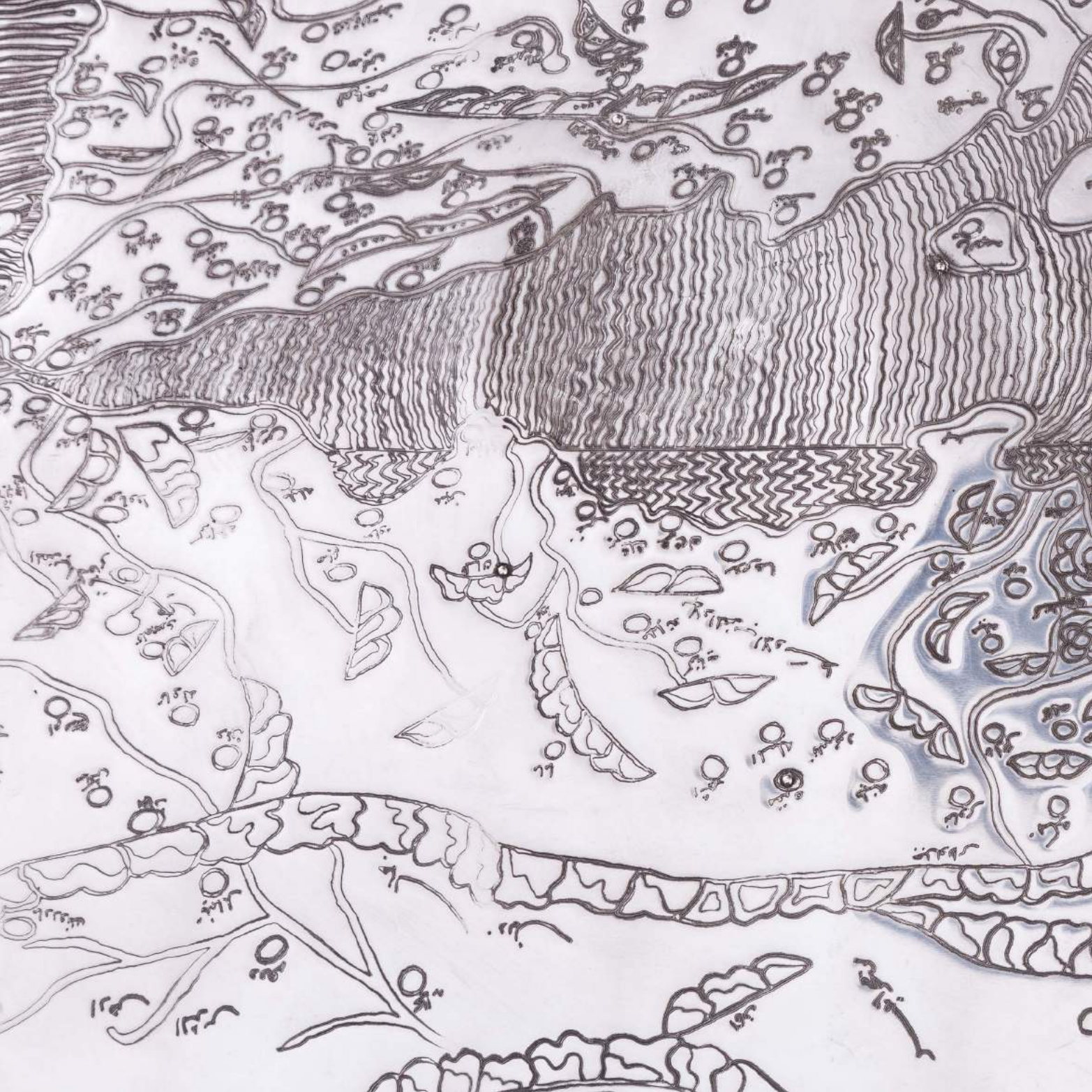
also called the *Tabula Rogeriana* or *Book of Roger*. It was completed in AH 548/1154 CE. The narrative follows itineraries, connected by travel distances expressed in miles (mil), units (far-sakh: three miles), caravan stages (marhala), day marches, or days of sailing. The earth is surrounded by the Encircling Sea, al-Bahr a-Muhit (the Greek Ocean).⁵ Each map was accompanied by a description, commenting on “all the wonderful things relating to each [country] and where they were with regard to the seven climates and also a description of the peoples and their customs, appearance, clothes and language”. The book presents a remarkably neutral vision of the world, free from theological or ideological presumptions.

Unlike subsequent maps, Idrisi’s omit boundary lines between Christian and Muslim dominions, seeking to offer an objective geography of landmass and of human settlement. The text is also very clear in its recognition of the limits of the known world: “This first climate begins to the west of the Western Sea, called the Sea of Shadows. It is that beyond which no one knows what exists.

There are in this sea two islands, called al-Khālidāt (the Fortunate Isles), from which Ptolemy begins to count longitudes and latitudes”.

Following Roger’s death in 1154, al-Idrisi left Sicily for North Africa, and his work fell into neglect. In the following centuries, mapmakers of various theological beliefs would elide this scientific vision of the world for one increasingly governed by theological imperatives. The silver map and all original copies of the book are now lost. Idrisi’s work is known only from ten surviving manuscript copies of the *Entertainment*.

⁵ Josef W. Meri, *Medieval Islamic Civilization: An Encyclopedia* (Routledge, 2005), p. 379.



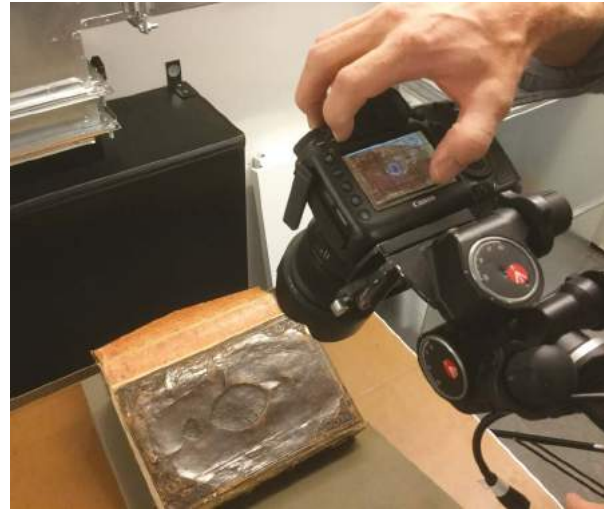


RECORDING THE BOOK OF ROGER AND RECONSTRUCTING AL-İDRISI'S WORLD-MAP

One of the best-preserved copies of the *Entertainment* is held by the Bodleian Library in Oxford (MS. Pococke 375, fol. 3c-4r). Made in Cairo in 1553, it contains not only the 69 regional maps but also a round world-map, now thought to be based on an earlier, 11th-century Islamic source.

In July 2017, Factum Foundation photographed the Bodleian's copy of the *Entertainment*. High-resolution photography was used to capture every detail of the maps in the book, and X-Rite ColorChecker Passports were used to ensure that colour had been recorded correctly.

The process of transforming the photos of the Bodleian Library's *Entertainment* into a single, circular image which could be routed onto silver is a complex procedure based on many different digital and physical skills involving both painstaking research and sensitive digital artistry.



Images

Above: Recording of the *Book of Roger* © Oak Taylor Smith for Factum Foundation

Opposite: The complete world-map © The Bodleian Libraries, University of Oxford



سومطرة

أرضية

Once every page of the book had been photographed, the double-page spreads were digitally corrected to create a single, flattened image.

The 69 regional maps were then placed alongside one another to create a single continuous world map. As the edges of each page did not align precisely with the pages surrounding it, mismatched features such as mountain ranges and rivers had to be adjusted to create continuity from one map to the next. The composite rectangular map shows the Afro-Eurasian landmass with the North- and East-African coastlines at the top and Eurasia at the bottom.

The rectangular map was then distorted to fit a circular frame, with Mecca at the central point of the circle.

One of the difficulties which arose when modifying the shape of the map was that the Arabic place-names became distorted as they neared the edges. In order to retain these words in their original, legible form it was necessary to extract every toponym from the map and then to re-insert them in the correct locations on the modified landscape.

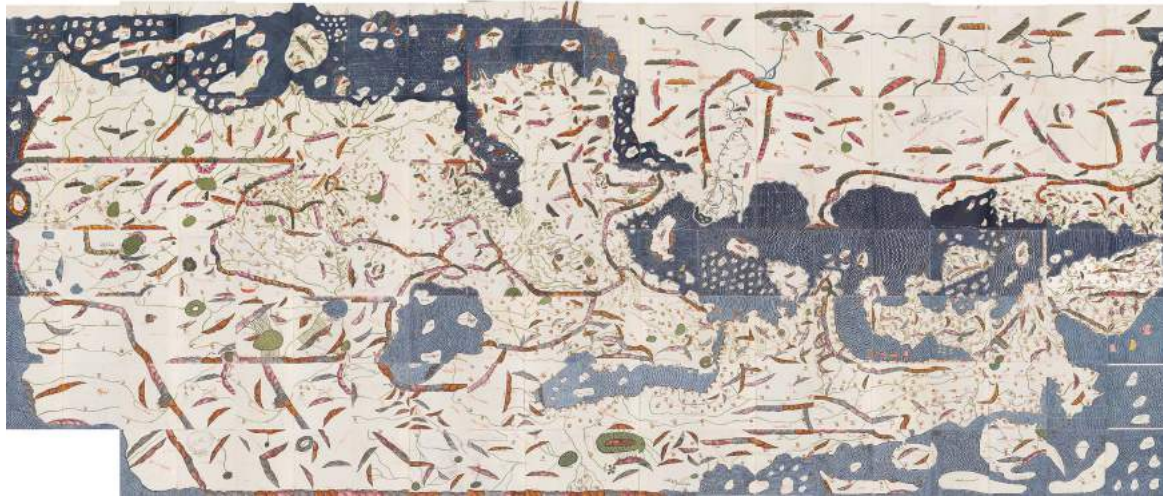
Images

Opposite above: The Iberian peninsular

Opposite below: Adjoining pages before and after digital correction

© Oak Taylor Smith for Factum Foundation



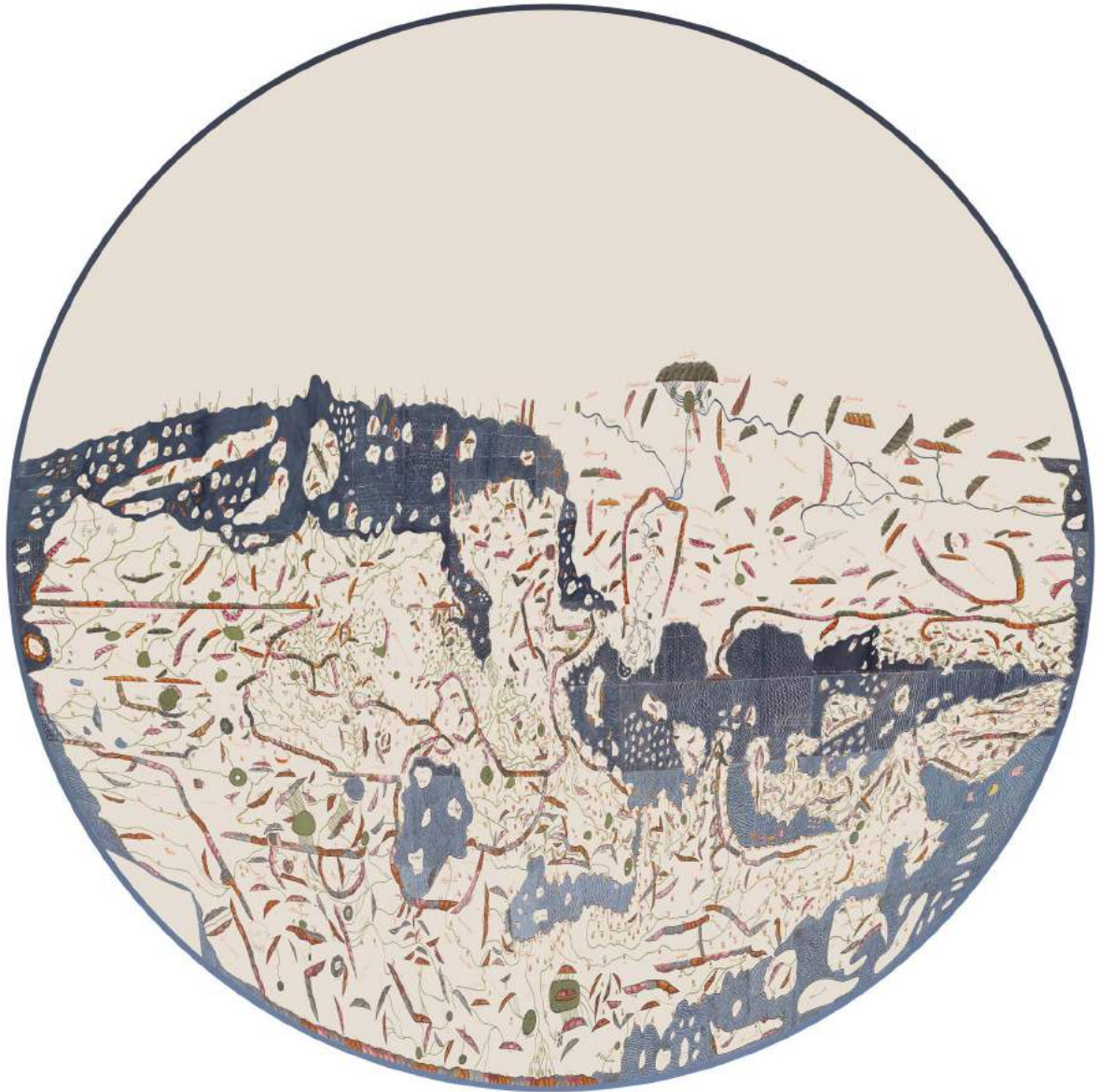


Images

Top: The composite world-map, partially corrected

Bottom: The composite world-map, showing page divisions and marked according to al-Idrisi's numbering system

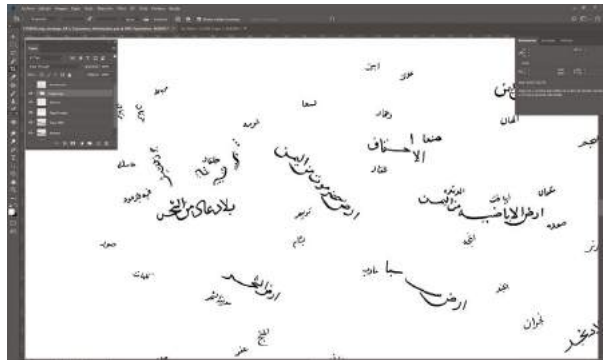
© Factum Foundation



The white background of each landmass was removed to allow the toponyms to be extracted. This section of the map shows the division of the Nile near its source, where al-Idrisi incorrectly believed that it split around the “Mountains of the Moon”.

The next stage was to create vectorial files from the circular image: to convert it from a pixelated image into a one that can be rematerialised using a CNC milling machine. Computer software is important, but only when supported by traditional craft skills. Each time any adjustment to the image was made a record was kept ensure fidelity with the original.

Finally, the vectorised image, the result of months of subtle and sophisticated mediation between physical object and the possibilities of digital representation, was sent to Factum’s CNC milling team so that the map could be routed in silver.



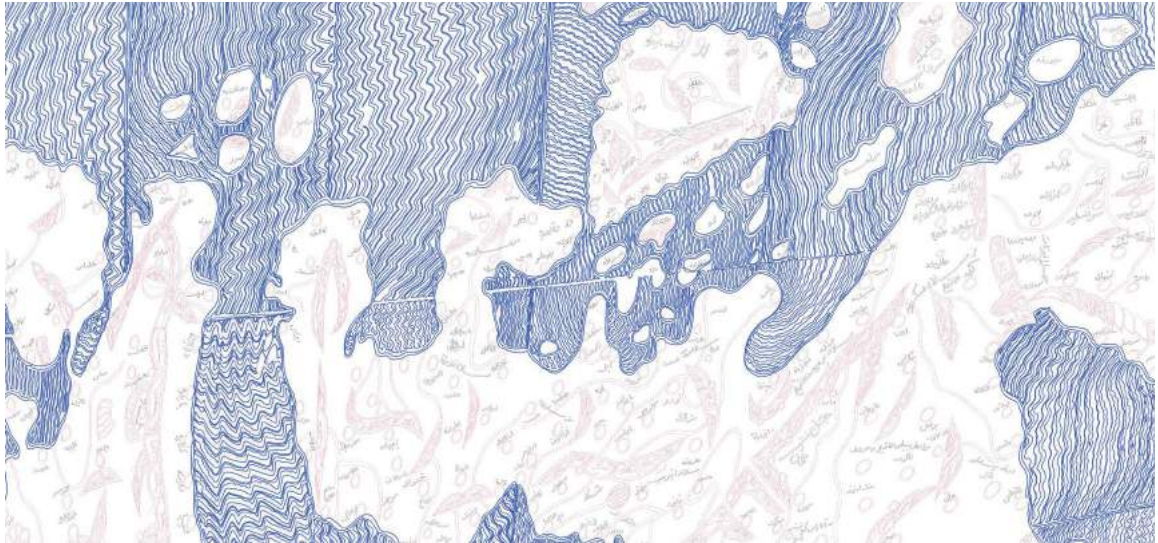
Images

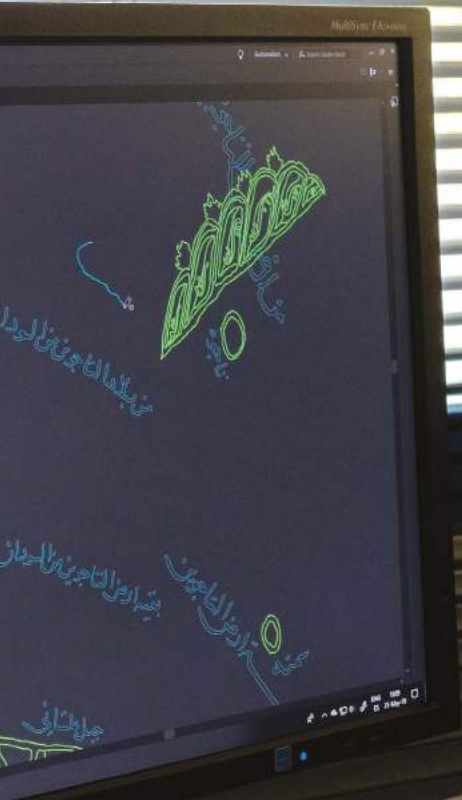
Top: Removing the white background

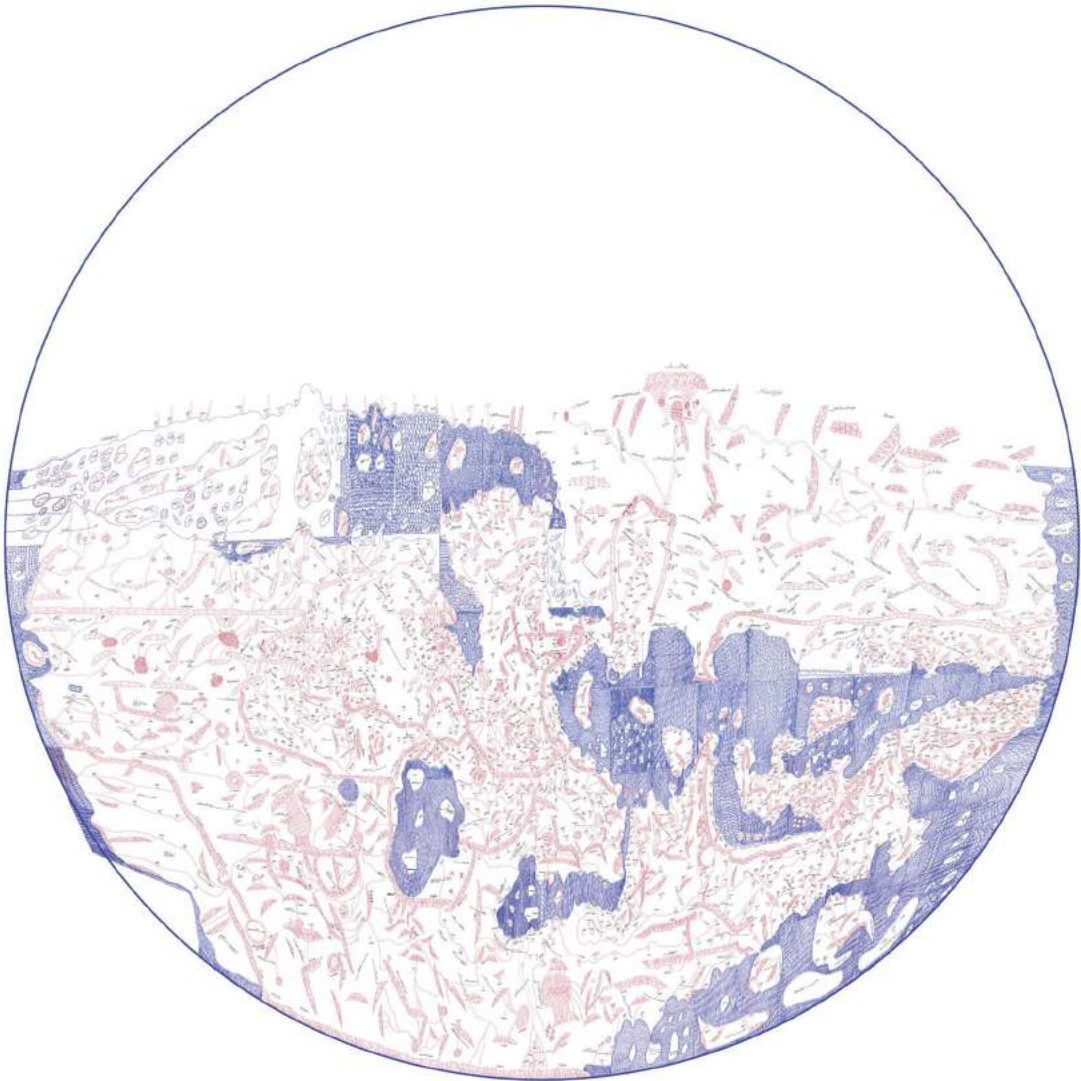
Bottom: Extracting the toponyms from the map

Opposite: Comparison between the bitmap and the vectorial images showing Italy (below, centre), Sicily (above), and Greece (left)

© Factum Foundation







Images

Above: The vectorial world map © Factum Foundation

Opposite: Manual correction during the vectorisation process

© Oak Taylor Smith for Factum Foundation

ENGRAVING THE AL-İDRISI MAP IN SILVER

Where al-İdrisi's map would have been engraved by hand, Factum Foundation's re-creation used CNC milling machines to engrave the contours of cities and coastlines onto the silver surface. Far from representing a de-skilling of the engraving process, Factum Foundation's use of these machines pushes them to previously unimaginable limits: Factum's use of the CNC was innovative, working into the surface of a thin silver by applying pressure to the point of the needle. Factum was able to create remarkably precise details by reworking the same surface multiple times in finer and finer definition to achieve the finest detail in both map and toponyms.

Factum's CNC milling expert Carlos Alonso was able to translate the vectorised world map into highly accurate commands to the milling machine. The map was engraved into eight sheets of silver, with each plate measuring 500 x 1000mm. The engraving of each took hundreds of machine and human hours and was performed using a spring-loaded tool, which is able to score the surface without rotating, applying variable pressure to the thin plate (0.3mm), minimising the action of the hand. The plates were fixed to the work surface using a contact glue which allows a degree of movement, allowing them to deform in response to the pressure of the engraving tool.

Once routed, the plates were cut and joined together by a skilled silversmith working with silver nails. The last task was to polish the surface until it achieved its final appearance.

Images

Opposite above: Milling in silver

© Oak Taylor Smith for Factum Foundation

Opposite below: Silver and copper milling

© Otto Lowe for Factum Foundation

Overleaf: The map milled onto silver

© Factum Foundation





معمل الجرافيك والخط العربي

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

خطوط

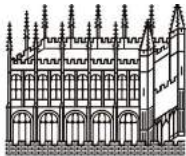
خطوط

خطوط

خطوط

Text by Professor Jerry Brotton, Daniel Crouch
Rare Books and Adam Lowe.

Special thanks to Richard Ovenden, Bodley's
Librarian in the University of Oxford, Nick Millea
and all the staff at the Bodleian Libraries.



Bodleian Libraries



FACTVM
FOVNDATION
FOR DIGITAL TECHNOLOGY
IN CONSERVATION

DANIEL
CROUCH
RARE
BOOKS