

## The art of medicine

### Jean-François Champollion and ancient Egyptian embalming

200 years ago this year, the future founder of Egyptology, French linguist and archaeologist Jean-François Champollion (1790–1832)—the first person since classical antiquity to be able to read the ancient Egyptian hieroglyphs—conducted a primitive experiment. It turned out to be one of the initial scientific steps on the long road to unravelling the mysteries of mummification, first described in the fifth century BC by the Greek historian Herodotus.

In 1812, Champollion was an impecunious 21-year-old assistant professor of history at the University of Grenoble and an assistant at the city's municipal library. A teenage prodigy in Oriental languages, he had become obsessed by understanding ancient Egypt, as a result of his schoolboy exposure to fascinating antiquities brought back from Egypt by the scientist and prefect of Grenoble, Joseph Fourier, who accompanied Napoleon Bonaparte's army on its expedition in 1798–1801. Champollion's library job gave him access to a small museum attached to the library, which happened to contain some Egyptian objects, including two human mummies, two other mummies of an ibis, and two alabaster funerary vessels of the type known to antiquaries as Canopic jars. Champollion became especially intrigued by these

vessels, one of which had a lid sculpted with the figure of an ape, the other with the figure of a jackal.

Many such jars—created out of stone, pottery or faience—had been dug from Egyptian tombs and made their way to Europe, where today they are familiar objects in museums. They date from the beginning of the Old Kingdom (when the Pyramids were built) to the middle of the Ptolemaic period (after the conquest of Egypt by Alexander)—a time span of two and a half millennia. Although the tomb robbers generally emptied the jars of their contents before selling them to dealers and collectors, their function could be guessed. Renaissance scholars and Napoleon's savants presumed that Canopic jars had been receptacles for human internal organs removed during embalming.

Some lids were animal-headed, showing apes/baboons, falcons/sparrow-hawks or jackals/dogs, whilst others bore the heads of humans, frequently female, or perhaps they were images of gods. The term Canopic jar was attached to them by early Egyptologists, purely because some jars resembled familiar human-headed jars from a totally different, non-funerary context, found at the ancient city of Canopus, located on the Mediterranean coast to the east of Alexandria. Although Canopus was named after a mythical Greek character in Homer's epics (Kanopos, the helmsman of Menelaus), the origin of the city predated the Greek invasion of Egypt in the fourth century BC; it went back to at least the time of Rameses II in the late second millennium. The human head on the jars was thought by early Egyptologists to represent a god called Canopus, a Ptolemaic-period personification of the ancient Egyptian god Osiris. His sacred image was taken to be a human-headed rotund jar, filled with Nile water, a recollection of which had passed into Arabic literature in the story of *El-Zir* ("The Jar"). This "Canopus of Osiris" image appeared on some Roman-period coins minted in Alexandria.

The smaller Canopic jar in the Grenoble museum was still sealed. Champollion decided to remove its lid, and inside he discovered a dark-coloured, coagulated, lump at the bottom of the jar. He then immersed the jar in boiling water for 2 hours, which melted the tar-like contents and allowed him to extract a cloth-wrapped object. Two centuries later, the lid is slightly blackened as a result of the spilling over of the jar's embalming fluid during Champollion's investigation. Champollion's brief "laboratory" notes, which survive in their French original, show that the budding archaeologist was excited by his examination of "The object 4 inches by 2" that was "very clearly of animal nature". He concluded: "It is from the liver, the brain or the cerebellum." A taxidermist from the Museum of Natural History in Paris, M Bilou, who happened to be visiting



Louvre, Paris, France/Giraudeau/The Bridgeman Art Library

Detail from *Portrait of Jean-François Champollion* (1831) by Léon Cogniet

Grenoble, thought that the embalmed organ could be a liver, a heart, or a spleen; he favoured a spleen on the grounds of its volume. Champollion's experiment proved the function of the jars beyond much doubt, although the organ in question was probably not a spleen. But his more original conclusion was the one he shared with a fellow student of ancient Egypt in Paris in a letter in 1813. Early scholars of ancient Egypt had coined a misnomer, wrote Champollion. So-called "Canopic jars" had nothing to do with any god Canopus. No such god had ever existed.

In place of the divine Canopus, Champollion proposed that the four different kinds of heads found on Canopic jars must represent four different "geniuses"—ie, aspects of God, now known to Egyptologists as the four sons of Horus. Later, after the decipherment from the 1820s onwards of the inscriptions written on many Canopic jars, Champollion and others could be far more specific. Today, we know that the ape head was linked with the cardinal direction north and guarded the lungs; it represented the god Hapy. The jackal head was linked with the east and guarded the stomach; it represented the god Duamutef. The falcon head was linked with the west and guarded the intestines; it represented the god Qebehsenuf. And the human head was linked with the south and guarded the liver; it represented the god Imsety (associated with the goddess Isis).

Although this explanation was widely accepted, the term Canopic was too firmly established to abandon. It was used, for example, in the 1920s excavation of the earliest known Canopic chest, from a tomb next to the Great Pyramid at Giza. Carved from a block of translucent calcite, the chest comprised four square compartments, in which the excavators found four small packets of entrails, some of them still steeping in a solution of natron used in mummification. Dated to the 26th century BC, the entrails were those of Queen Hetepheres, the mother of Khufu, builder of the Great Pyramid. In the tomb of Tutankhamun, from the 14th century BC, the Canopic shrine containing the Canopic chest is elaborate and exquisite. When the lid of the chest was removed by its excavator Howard Carter, it revealed four finely modelled, painted calcite heads of the young pharaoh, facing each other in two pairs. The heads were detachable. Beneath them, drilled into the calcite of the chest, were four hollows, each of which contained a miniature coffin of beaten gold wrapped in linen and smeared in resin. These contained the viscera of the dead king. Each miniature coffin was inlaid with the hieroglyphic name of its appropriate tutelary genius: Hapy (lungs), Duamutef (stomach), Qebehsenuf (intestines) and Imsety (liver). Over the coffins had been poured black resin of a kind already found on Tutankhamun's coffin and mummy. According to Carter, "There was...sufficient evidence to show that the anointing commenced with the south-east coffin, thence to the south-west coffin, the north-west coffin and ending by the north-east coffin, when a very little of the unguent was left."



Canopic jars of Neskhnons, from Deir el-Bahari, Upper Egypt, 21st Dynasty 1069–945 BC

The youthful Champollion perceived a connection between the four Canopic deities and the entry of the soul into the underworld as depicted in the paintings of the ancient Egyptians. He detected a role for each deity in the classic scene of the weighing of the human heart against the feather of truth on the day of judgment in the Egyptian Book of the Dead, which Champollion was the first scholar to begin deciphering in 1824. For him, the (female) human head brought the dead person's soul to the tribunal, the falcon and the jackal were responsible for the weighing of the deceased's good and bad conduct in the pans of the infernal balance, while the ape perching on the balance presided over the accuracy of its operation by the falcon and the jackal. Together, Champollion maintained, the four heads were emblems of "the four great qualities of God": goodness, the power of life, the power of death, and justice.

This mythology explains why the heart was never among the organs chosen for preservation in Canopic jars. Ancient Egyptians regarded the heart as the source of human wisdom and the seat of memory and the emotions, unlike the brain, which was extracted and discarded during mummification. The heart was too precious for such treatment and was always left inside the mummified corpse for use in the afterlife. But as a sort of insurance policy for the day of judgment, an amulet, known as a "heart scarab", was typically wrapped in the mummy's bandages and inscribed with hieroglyphs appealing to the heart not to reveal its owner's secrets before God.

Today, Canopic jars and mummies are investigated with x-rays, CT scans, and DNA analysis. But Champollion's main contribution to their understanding—his celebrated decipherment of their hieroglyphic inscriptions beginning in 1822—is still the most radical advance of all in the study of ancient Egyptian civilisation.

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**Further reading**

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