Hieronymus Bosch and other early Renaissance artists depicted ‘stone operations’ in which stones were supposedly surgically removed from the head as a treatment for mental illness. These works have usually been interpreted either as portraying a contemporary practice of medical charlatans or as an allegory of human folly, rather than a real event. As trepanation for head injury and mental disease was actually carried out in Europe at this time, another interpretation of these works is that they are derived from a common medical practice of the day.

Hieronymus Bosch (c. 1450–1515) is one of the most enigmatic painters of all time. Art historians have variously characterized this Flemish artist as a fanatic orthodox Christian, a satirical heretic, a pornographer and a member of a secret black-magic sect (the ‘Adamites’) worshipping the divinity of the sex act. His rich and flamboyant symbolism has been decoded (supposedly) in terms of such things as alchemy, folklore and magic, various secret Christian sects, Freud and Jung, the Hebrew Cabala, and the use of hallucinogenic drugs.

Two things are clear about Bosch. One is that the plethora of conflicting interpretations reflects the imagination of art historians more than any solid evidence. The second is that Bosch had a 20th-century mentality. His fantastic images have been viewed as anticipating Salvador Dali and the Surrealist painters. Norman O. Brown said Bosch foreshadowed modern ideas of ‘therapeutic sexuality’. Henry Miller claimed him an inspiration to his own creativity. New interpretations of Bosch still pour out, and his images are found on the covers of rock-music albums (for example, One Nation Under Ground, Pearls Before Swine, 1967) and books on the holocaust (for example, see Ref. 9).

Perhaps the Bosch painting of most interest to neuroscientists is The Cure for Madness (or Folly), also known as The Stone Operation (Fig. 1). This painting shows someone making a surgical incision in the scalp. The inscription has been translated as ‘Master, dig out the stones of folly, my name is “castrated dachshund”’. This is usually interpreted as reflecting a contemporary belief that folly, stupidity and madness were due to stones in the head. ‘Castrated dachshund’ was an epithet for a simpleton.

The art-historical literature is replete with a large number of conflicting interpretations of the details of this painting, such as the role of the two onlookers, the funnel on the surgeon’s head, the book on the woman’s head, the fact that a water tulip, not a stone, is being extracted from the head, the gibbet in the background and other puzzling aspects. (The significance of the water tulip is obscure and controversial, although it has been suggested that, in 16th-century Holland, it carried the connotation of stupidity. A more-recent interpretation proposes that the ‘tulip’ is in fact a lotus, an ancient symbol of spiritual awareness.) In spite of the disagreement on the meaning of the various apparent symbols in the painting, virtually all interpretations of the paintings fall into one of two classes. The first class views the painting as representing (and ridiculing) an actual practice whereby itinerant medical charlatans deceived people into believing that they could cure mental and ‘psychosomatic’ symptoms by removing stones from the head:

**Fig. 1. H. Bosch ‘The Cure of Folly or ‘The Stone Operation’ (16th century). The inscription is translated in the text. (© The Prado Museum, Madrid.)**
the head. The second class of interpretation claims that there is no evidence at all for any such contemporary pseudo-medical practice\(^3,8,10\); rather, the painting is viewed as an allegory of the extreme stupidity and gullibility of humans, a recurrent theme in Bosch’s work.

After Bosch, there were a number of works, again usually Flemish, depicting the removal of stones from the head as a cure for madness and folly by Peter Bruegel, Jan Steen, Pieter Huys, Nicolaes Weydmans and others (Figs 2 and 3). Following the two overall interpretations of the Bosch mentioned above, these later works have been interpreted either as depicting an actual common practice of medical ‘quackery’\(^12–14\) or simply as imitating Bosch’s allegory of human stupidity (as each of these artists was clearly influenced by Bosch). In both these art-historical interpretations of the depictions of ‘stone operations’, the possibility that legitimate surgical operations on the head were actually performed to relieve symptoms, was apparently, quite inconceivable\(^3,14\).

Trephining

The oldest known surgical procedure is trephining or trepanning, the removal of a piece of bone from the skull. It began in the late Palaeolithic period and has been carried out in virtually every part of the world. It is still used in the modern neurosurgical suite, in traditional Kenyan medicine and as an ‘alternative medicine’ method of enhancing consciousness. Trephining has a strong and continuing tradition in Western medicine. It is described in detail in the Hippocratic work On Wounds in the Head where it is indicated for various types of head injury. From the Renaissance until the beginning of the 19th century, trephining was widely advocated for the treatment of head wounds, particularly for depressed fractures and penetrating head wounds. It was also used, at least into the 18th century, for the treatment of epilepsy and mental disease\(^15–18\).

Roger of Parma (c. 1170) wrote in his Practica Chirugiae (The Practice of Surgery):

> For mania or melancholy a cruciate incision is made in the top of the head and the cranium is penetrated, to permit the noxious material to exhale to the outside. The patient is held in chains and the wound is treated, as [described] above\(^19\).

Robert Burton, in his still-in-print classic Anatomy of Melancholy (1652), similarly prescribed boring a hole in the head for melancholy:

> Tis not amiss to bore the skull with an instrument, to let out the fuliginous vapors... Guinerius cured a nobleman in Savoy by boring alone, leaving the hole open a month together by means of which, after two year’s melancholy and madness he was delivered\(^20\).

Thomas Willis, Professor of Natural Philosophy at Oxford, one of the founders of the Royal Society and author of Cerebri Anatomie (1664), the first comprehensive monograph on the brain (dealing with anatomy, physiology and clinical neurology) noted that:

> Threatening, bonds or strokes were ‘Curatory’ for madmen [but] Specific Remedies such as St. John-wort as well as Chirurgical Remedies such as Trephining or opening the skull [were also indicated]\(^21\).

It is interesting to note the reference to the use of St John’s Wort to treat ‘madmen’ in the 17th century. The mechanism of action of this herb is still unknown over 400 years later, although it is used by many to treat depression and anxiety.

Figure 4 is a 1573 woodcut showing a trephination in progress in a home operation\(^22\). When the operation was moved into hospital settings in the beginning of the 19th century, the mortality rate was so high from the rampant infections characteristic of contemporary hospitals that trephination, for any reason, declined markedly until the introduction of modern antisepsis at the end of the century\(^22\).
Bosch and medical practice

Trepanning or trephining, was a standard surgical procedure during the periods in which the various depictions of ‘stone operations’ were made such as those in Figs 1–3. Furthermore, the procedure was used to treat behavioral disorders as well as head injuries. Thus, it seems likely that Bosch, and the other artists who produced the various pictures of stone operations, knew of the existence of the actual contemporary medical procedure of trepanning. Indeed, the details of their portrayal of the ‘stone operations’ were often very close to the detailed instructional diagrams on trephining found in surgical handbooks such as Joannis Scultetus’ Armamentarium Chirurgicum shown in Fig. 5.

Thus, whatever the abstruse symbolism in Bosch’s Cure of Folly, whether he was ridiculing the church, the medical profession, trepanning or all humanity; or whether it advocates some religious cult, some wild sexual practice, the advantages of trepanning or nothing at all, it seems indisputable that the writings of art historians on this and similar works contain a great deal of folly. Apparently, unknown to many of these historians, Bosch’s painting and derivatives by Bruegel and others, were based on a very real medical practice of their time.

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