In 1792, a priest in Germany consulted a young doctor about a buried corneal foreign body hidden in a small, hard mass that partly covered the pupil. During removal of the foreign body, the doctor inspected the corneal incision with a microscope to confirm the suspected presence of the foreign body. This may be the first use of a microscope in eye surgery.


James Wardrop, FRCSEd, FRS (1782-1869), surgeon to the Prince of Wales (later George IV, king of Great Britain and Ireland) at age 40 years and an irascible recluse in his later years, wrote the first English-language book devoted exclusively to the subject of the morbid anatomy of the eye. In its second edition,1 he cited what may be the first recorded case of ophthalmic surgery in which a microscope was used. In this 1798 report, D. Manniske (Figure 1) from Frankenhausen, a small town in Thuringia in central Germany, described his 1792 removal of a buried corneal foreign body.2 Wardrop's translation of Manniske's German article reads:

A priest requested my assistance concerning a speck on the eye. He had on the cornea of the right eye a dark speck, which greatly impaired his vision, and of which he gave the following account. Two years before, he found suddenly a little pain in the eye. By examination he remarked, on the white of the eye, below the upper lid, a black spot; it did not hurt his sight, and the pain soon went away, so he took no further notice of the accident. Some time having elapsed, he was aware that this spot had changed its situation, and appeared at the union of the cornea with the sclerotic coat. The speck continued its progress very slowly, but uninterruptedly; it came forwards on the cornea, approached towards the pupil, and at last covered a portion of it. The patient was in this situation when I saw him. There was a prominent spot above the cornea, which felt hard, and equalled (sic) the size of a small lens, but was longer than it was broad. Many small red vessels appeared like streaks around it. The patient had no pain. The undescribable (sic) hardness of the spot, along with its situation, made me think that it was a foreign body fastened in the eye. I made an incision on the spot from without inward, and saw, with the assistance of a microscope, a black body lying in the incision. I removed it with the point of the knife, from the small hole it had formed for itself in the cornea, and found it to be a hard wing case of a beetle.1

In Wardrop's translation, Manniske's handmicroscope appears as a shorter microscope.

Although Manniske was neither a well-known ophthalmic surgeon nor an academician, he was an important medical figure in the late 18th and early 19th centuries in Frankenhausen.

Frankenhausen became Bad Frankenhausen in 1927. The town had long been a health spa site. Salt has supported the economy of Frankenhausen since before its founding in 998 by Otto III, a German king and Holy Roman emperor (980-1002).

The present DRK Manniske Krankenhaus (German Red Cross Manniske Hospital) in Bad Frankenhausen was founded in 1799 by Wilhelm August Gottlieb Manniske, MD. Neither I nor Günther Hoffmann, MD, the current medical director of the hospital, have found a D. Manniske or any other medical Manniske from this era in this area other than Doktor Wilhelm August Gottliebe Manniske (G. Hoffman, written communication, January 2006). Hoffmann suggests that the initial, D, is an abbreviation for doktor rather than the author's initial, as I had supposed. It is likely

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Hoffmann is correct and D. Manniske must represent Dr Wilhelm August Gottlieb Manniske.

Wilhelm August Gottlieb Manniske (1769-1835) lived in a time awash with the ideals of the Enlightenment. He was born into a priest’s family; his deeply felt sympathy for the poor and disenfranchised, which led to his founding the hospital bearing his name, no doubt stemmed from such an upbringing.

Part of his 1791 University of Jena medical doctoral thesis on medicinal herbs confirmed Withering’s reported cardiac effects of foxglove extracts. Manniske remained committed to following advances in medicine and science. He published an article on the application of forceps in labor. His introduction of cow-pox vaccination led to his being considered one of the pioneers of immunization in Germany. He also studied the health of local salt workers. Possibly, these studies encouraged him in 1818 to found the still-extant spa, the Lower Bath.

Medicine in the 1790s was primitive. In the late years of the decade, an American president died of quinsy (peritonsillar abscess) after treatment by bleeding, and a heroic British admiral lost his right arm, which was amputated without anesthesia. Fischer described 18th century German surgeons as being scarcely able to even write or read German and being apprenticed to barbers (quoted by Billings). In light of this description, Manniske’s patient was very fortunate.

How did this venturesome young doctor manage to perform corneal surgery without anesthesia? The foreign body apparently covered only part of the pupil, thus his patient must have seen the knife. How did Manniske control his patient’s movements? What sedation did he use? What knife did he use? What handmicroscope did he use? Could he have used the microscope to see the operative field when he made the incision or when he picked out the foreign body?

Although Manniske was not a trained eye surgeon, he may have known the general principles of eye surgery of the time. Possibly, he used an arrangement similar to the one Charles St Yves (1667-1736, surgeon oculist of the City of Paris) described in 1749 to perform his surgical procedures:

...let the patient be placed fronting the light, the operator must be seated directly before him, and somewhat higher. They must be both so placed, that the head so the operator may not shade the eye which has the cataract; let him put the patient's legs between his own, in order to be very near him; let an assistant, placed behind the patient, lay his left hand on his head, and his right under his chin, (supposing the operation is to be performed on the left eye:) then, leaning the patient's head on his breast, let him hold it firm, that the patient may not give it any motion.

Surgical pain relief in preanesthetic days included alcohol intoxication and the use of “extracts of the poppy, henbane and mandragora root” (henbane is hyoscyamus and mandragora is a solanaceous plant containing alkaloids acting like belladonna) and “conjuration and incantation, hypnosis, and acupuncture.” Their use in Frankenhausen in 1792 must remain conjectural.

Manniske described neither the knife nor the microscope he used. Because Manniske used the sharp point of the knife to remove the foreign body from its depression, he likely would have used a narrow, pointed scalpel as Scarpa illustrated in 1801. What handmicroscope did Manniske use? Commonly used microscopes available to Manniske included the Nuremberg box, the compass, and the botanic types.

The Nuremberg box microscope rests on a box stand into which a paper tube slides. The tube's width, which severely interferes with illumination, and the close focus make it quite unsuitable for looking at a living human eye.

The compass microscope name refers to the design of the instrument. A clamp at the tip of one arm of the

![Figure 1. Wilhelm August Gottlieb Manniske, MD. Picture courtesy of Günther Hoffmann, MD, DRK Manniske Krankenhaus, Bad Frankenhausen, Germany.](https://archopht.jamanetwork.com/)

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A knurled knob on a screw connecting the 2 arms regulates the distance from the lens to the specimen. This instrument behaves very much like a handheld magnifier fitted with a handle. However, when the microscope is held in the normal position, the remaining section of the specimen support arm still interferes with focusing on a human eye.

An arm perpendicular to the handle of the botanic type microscope supports a moveable specimen holder (Figure 2). The specimen holder may be removed but the arm is fixed. This makes it impossible to focus on a human eye with the instrument held in the normal position. With the scope reversed, not only is the observer able to see at a satisfactory distance, but the illumination of the eye is better. Having used historic models of both a botanic scope and a compass scope in the reversed position, I find that either one could have served Manniske’s purpose.

Manniske could not have used any microscope available to him to make his incision or to remove the wing case because of the very short focal distances of contemporary instruments and difficulties caused by poor illumination and lack of anesthesia.

In 1792, Manniske, then a young, recently graduated medical doctor, encountered a challenging eye case. The history was that conjunctival foreign body of some duration had migrated across the limbus to occupy the center of the cornea. There it presented as a hard, superficial corneal mass. Uncertain there was a corneal foreign body buried in the mass, he incised the mass and used what he described as a handmicroscope to inspect the depth of the wound. Seeing a black object deep in the wound, he enlarged the incision and successfully removed the mass with the tip of his knife. Although he did not use the microscope either while he made the incision or to remove the foreign body, I suggest we should credit him with appreciating the need to see better when performing eye surgery and for using an available instrument to help him perform a simple eye procedure. Perhaps this was the first use of a microscope in eye surgery.

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Figure 2. Photograph of a botanic microscope.

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Intraocular Tooth
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A 16-year-old boy after self-inflicted gunshot wound to the face.
A. 3-Dimensional computed tomography facial reconstruction demonstrating intraocular and intraorbital tooth fragments. B. Intraoperative photograph showing a large fragment on the retinal surface. C. A 16-mm tooth fragment removed from the vitreous cavity. Patient currently has hand motions visual acuity after intraocular foreign body removal.