SPECIAL ARTICLE

The Eyes of Johann Sebastian Bach

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Johann Sebastian Bach's only physical problem seems to have been his vision. Myopia seems most likely, and it is probable that he developed cataracts at an older age. In addition to the cataracts, his worsening vision may have been due in part to some other eye problem. During the last year of his life, Bach's vision became so poor that he decided to have his eyes operated on. Two operations were performed in 1750 by the traveling English eye surgeon John Taylor. Most likely the first operation was Taylor's standard couching procedure. About 1 week after the first operation, Bach had to be operated on again because of a reappearance of the cataract. Many painful and/or vision-reducing complications could have been induced by these intraocular operations: uveitis or endophthalmitis, secondary glaucoma, hemorrhage, retinal detachment, and even sympathetic ophthalmia. Bach was "completely blind" after the operations, and he died less than 4 months after the final operation. *Arch Ophthalmol. 2005;123:1427-1430*

Johann Sebastian Bach (1685-1750) is probably the most famous composer of all time, and his music is still the gold standard for many practicing musicians as well as for listeners of classical music. Unfortunately, an unknown but substantial amount of his work is lost. The same applies to information about Bach's private life. In contrast to Wolfgang Amadeus Mozart, for example, who had a vivid and abundant correspondence with his family members, only a few of Bach's letters have survived.

Two biographies have been written by persons who knew Bach, or who interviewed people who had known him personally.[1,2] Bach's biographies are *Nekrolog auf Johann Sebastian Bach* (1754), by Bach's eldest son, Carl Philipp Emanuel, in collaboration with a former pupil of Bach's, Friedrich Agricola[1]; and *Ueber Johann Sebastian Bachs Leben, Kunst und Kunstwerke* (1802), by Johann Nikolaus Forkel.[2] The writers of the *Nekrolog* did not themselves witness much of the last years of Bach's life. They no longer lived in Bach's home; both had worked since 1747 as musicians in Potsdam. Forkel relied heavily on the *Nekrolog* in writing his biography but also interviewed many persons who had known Bach, including Bach's sons Carl Philipp Emanuel and Wilhelm Friedemann. All later biographies of Bach are based on these works.

Furthermore, only one portrait of Bach is undoubtedly authentic. The portrait commissioned by Bach and painted by Elias Gottlob Haussmann (1695-1774), dated 1746, shows Bach holding his trademark: a triple canon for 6 voices (BWV 1076) as proof of his highly developed skills as a composer. Bach's second wife, Anna Magdalena, considered the portrait a good likeness. Unfortunately, when the painting underwent major restoration in 1913, the details of the portrait were altered considerably.[3] In 1950, a studio copy of the original portrait was discovered in the United States, also by Haussmann, signed and dated 1748 (**Figure 1**). This copy gives a rough idea of Bach's appearance.

Dubious resources of uncertain authenticity are interesting but not reliable. For example, a skeleton alleged to be Bach's

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Figure 1. The 1748 painting of Bach by Elias Gottlob Haussmann (courtesy of William H. Scheide, Princeton, NJ).[4]

Figure 2. Detail of the eyes of Bach according to Haussmann, 1748 (courtesy of William H. Scheide, Princeton, NJ).[4]

was found in 1894 and examined by Wilhelm His, professor of anatomy at the University of Leipzig, Leipzig, Germany, and father of Wilhelm His, Jr, who discovered the atrioventricular muscle bundle in the heart that is named after him, the bundle of His.[5] Another example is the pair of reading glasses (+2.5 diopters [D] sphere and –0.5 D cylinder; the axis cannot be given as the lenses are freely movable within their frame) that supposedly belonged to Bach, but these also can never be proven to have been in his possession.[6]

This article comments on the ophthalmologic aspects of Johann Sebastian Bach, as viewed by a present-day ophthalmologist.

THE YOUNG BACH

Bach's only physical problem seems to have been his vision. His eyes had "naturally bad vision" (*Sein von Natur blödes Gesicht*), and "this was further weakened by a lot of studying, sometimes even all night long, especially during his youth."[1(p167)]

Myopia has been suggested by several authors on the basis of Bach's appearance in the Haussmann painting, which shows "the vertical furrows running upward from the bridge of the nose as well as the narrowed eyes, the result of myopia."[7(p1797)] The word *myopia* is derived from Greek and means "squeezing." However, other refractive errors such as hyperopia and astigmatism can also cause narrowing of the eyelids.

Myopia is generally preferable to hyperopia, since myopic people have adequate near vision. For a musician who has not yet matured and is still mastering his art by extensive note reading and writing, near vision is essential. This suggests that Bach was probably myopic. Hyperopia or astigmatism would have been much less compatible with his daily activities. Furthermore, Bach was at risk for myopia; as he was a scholastic success (one of the best students in his school, and he even skipped a year), he performed a lot of near work and he read considerably.[8]

Bach's myopia can only have been moderate. With a refractive error of –2 D, his far point would have been 50 cm. A higher refractive error of, for example, –5 D would have given Bach difficulty playing the church organ, his favorite instrument. He used both feet for playing the pedals of the church organ, and this required leaning back on the seat to free the legs for this action. Bending forward to read a music score at the church organ while also using both hands at the keyboard calls for at least one foot on the ground to maintain balance; the greater the refractive error, the worse this problem would become. Recognizing faces on the street certainly would have been a problem for a moderately myopic individual in the era before spectacle correction. Spectacles could have solved this problem, but the use of spectacles for anything other than reading was not widespread until a century after Bach's death.[9] Biographies do not mention the use of glasses by Bach at all.

Amblyopia is another theoretic possibility, but there is no evidence to support this. Bilateral amblyopia from severe hyperopia or astigmatism is also a theoretical possibility, but it would have also impaired near vision. Bilateral amblyopia due to myopia is exceedingly rare, but some near vision might be retained.

BACH IN HIS OLD AGE

It seems that in general Bach was in good health, except in his final year. Considering the amazing amount of music he wrote, the almost continuous demand for performances, the care of the 20 children he had with his 2 successive spouses, his concern for numerous students who lived in his house, and the vigorous appearance of Bach in his 61st year in the Haussmann painting, it is most unlikely that he could have suffered any serious or chronic diseases. Furthermore, biographies explicitly mention Bach's strength and healthy constitution: *seinen übrigen noch sehr muntern Seelen— und Leibeskräften* (his lively soul— and body strengths).[1]

The only known period of sickness occurred between 1730 and 1740, when Bach had to cancel a journey to Halle, Germany, to meet George Frideric Handel, a contemporary composer who was also born in 1685.[1] Nothing is known about the nature and duration of this illness. Additional information about Bach's physical appearance is given by the Haussmann portrait, which shows that Bach was obese.

Another striking feature is his narrowed eyelids (**Figure 2**). A closer look seems to give the impression of dermatochalasis; this has no serious clinical implications except that it can sometimes restrict the superior visual field.

According to his contemporary biographies, Bach's eyesight deteriorated as he aged. There are many possible explanations for this, with cataract being the most logical. There are no clues suggesting or excluding other diseases, such as glaucoma or age-related macular degeneration. It seems unlikely that his vision deteriorated as a result of a sequela of myopia, because his myopia seems to have been only mild.

THE OPERATIONS

During the last year of his life, Bach's vision became so poor that he decided, after persuasion by his friends, to have his eyes operated on. Two operations were performed in 1750 by the traveling English ophthalmiater "Chevalier" John Taylor

(1703 or 1708-1772), who happened to be in Leipzig.

Taylor had completed a surgical training in England; he also attended lectures by Hermann Boerhaave in the Netherlands and learned the art of couching from Jean Louis Petit in France.[10] After his training, Taylor started practicing in Switzerland, where he blinded hundreds of patients, he once confessed. During his working life, he spent most of his time traveling around in a coach painted all over with eyes and the words *qui dat videre dat vivere* (giving sight is giving life). His travels took him over the greater part of Europe and beyond, to Russia and Persia, where even kings and emperors were among his patients. More than once he was robbed and almost killed during his travels. Taylor knew a lot about ophthalmology and left scientific articles in several languages. He was the first to describe keratoconus, which he also illustrated in a recognizable way. In the surgical approach to strabismus by means of cutting an eye muscle, he was ahead of his time. This made Taylor a rare combination of a man of serious science and a charlatan in daily practice.

Patients in the second half of the 18th century were operated on while seated upright in a chair and held tightly by a helper, who made sure the patient did not move at crucial moments in this era without anesthetics being in common use (**Figure 3**). The only anesthetics were alcohol and opiates. Taylor was known to use a spatula to press the upper eyelid against the orbital wall, a technique used by other surgeons as well.[12] By pressing the deep tissues of the superior orbital quadrants through the upper sulcus with this spatula, it would be possible to achieve some anesthesia. Parts of the nasociliary nerve or its branches that form the short posterior ciliary nerves were damaged. These latter nerves supply sensory innervation to the cornea, iris, and corpus ciliare, and hence some pain was reduced in these areas. A resultant advantage to this approach was fixation of the bulbus.

Because Taylor was right-handed, he preferred operating on the left eye of the seated patient, even if this was the healthy one! Even physicians in his time, such as Eschenbach, who wrote a whole book about Taylor and his operations, criticized this approach.[13] Taylor's habit of covering the wounds he made with a bandage was also criticized because it increased the risk of infection. Patients were allowed to remove the bandage only after 5 to 6 days, when Taylor had already moved on to the next town to operate on new victims. Often he charged exorbitant amounts of money for these interventions, depending on the wealth of the patient. If they were not able to pay cash, he also accepted valuables like gold watches.

The first operation on Bach took place between March 28 and 31, 1750, and the second one was performed between April 5 and 7.[14] Most likely the first operation was Taylor's standard couching procedure, which took him 9 pages to describe in his book *Cataract and Glaucoma* (1736).[10] In this operation, an incision a little larger than 4 mm was positioned about 3.5 mm posterior to the limbus. With a planoconvex needle, the posterior capsule was opened and followed by anterior and downward movement of the needle so that the opaque lens was displaced inferiorly into the vitreous. In the dissertation by Johann Philipp Schnitzlein dated 1750, this technique of cataract surgery is illustrated by an artist's impression (**Figure 4**).

About 1 week after the first operation, Bach had to be operated on again because of a reappearance of the cataract (*wieder aufgetreteten Stahrs*).[13] It is possible that the couching was followed by an anterior displacement of the lens, pupillary block, and glaucoma.

What exactly took place during the operations will never be known, but Taylor's general approach included bloodletting, laxatives, and eyedrops of blood from slaughtered pigeons, pulverized sugar, or baked salt.[13] He sometimes made periocular incisions, which then were covered with bandages that incorporated baked apple or a coin. In cases of serious inflammation, Taylor prescribed large doses of mercury. This all took place in the pre-

Figure 3. Impression of couching in the 18th century, showing the surgeon and a helper to hold the patient tightly, as was necessary in the preanesthetic era (Lorenz Heister, 1718).[11]

Figure 4. Ideal method of couching by toppling and pushing down the lens via a posterior (scleral) approach, according to J. P. Schnitzlein in his 1750 dissertation.[11]

antiseptic era. Many painful and/or vision-reducing complications could have been induced by these intraocular operations: uveitis or endophthalmitis, secondary glaucoma, hemorrhage, retinal detachment, and even (after 4-8 weeks) sympathetic ophthalmia.

We will never know whether Taylor operated on one or both eyes on both occasions. He may have operated the second time because the result was not quite as he wished the first time, or he may have operated on the second eye on another date just as these days we operate on the 2 eyes with an interval.

According to the newspaper *Vossische Zeitung* (1750, No. 41), Bach was able to see much better after the first operation, supporting the suggestion of cataract displacement giving a little or some improved vision.[15] However, the newspaper might have been influenced by Tay-

lor himself, who had a very well-developed sense of public relations and who often advertised in local newspapers to announce his arrival and miraculous operations.

The biographies indicate that Bach was completely blind after the second operation, and that he felt ill and experienced painful eyes.[1,2] However, Forkel[2] stated that Bach's eyes were painful even before the operations took place. Since Forkel wrote his biography more than half a century after Bach had died and gained most of his information indirectly, it seems possible that this description was erroneous.

The blindness and pain after Taylor's interventions are compatible with most of the possible postoperative complications described, especially the ones concerning inflammation and/or secondary rise of pressure.

Because Bach was "completely blind" after the second operation, it can be postulated that this was due to operations on both eyes. This is a possibility, but it is also possible that one eye was already (almost) completely blind before the operations took place. If this was true about his right eye, he could indeed have lost vision completely by Taylor's preference for operating on the left eye. Furthermore, the expression *completely blind* used by medical laymen who wrote his biographies might not have been the interpretation of modern ophthalmologists.

Bach never recovered fully after the operations. The sources mention a sudden return of his vision a few days before his death, which was followed by a stroke. This was followed by *hitsiges Fieber* (burning fever), leading to his death on July 28, 1750, at 6:15 PM, in the 66th year of his life, despite the care of 2 of the most skillful physicians in Leipzig.[1] Bach died less than 4 months after his final operation.

A sudden, brief, spontaneous return of his vision seems unlikely after a prolonged period of inflammation and/or elevated intraocular pressure. It may have been a hallucination or the Charles Bonnet syndrome, in which patients experience complex visual hallucinations.[16] This syndrome is associated with impairment or loss of vision due to deafferentation that causes sensory cortex to exhibit spontaneous independent activity with resultant conscious imagery. *Stroke* in those days was a nonspecific term and may have indicated merely that Bach lost consciousness.

The fever suggests an infection. It is very difficult to make a clear connection between the operations and the illness that killed him. It seems unlikely that a postoperative endophthalmitis would have smoldered for 4 months before causing a fatal sepsis. Certainly the operations, bloodletting, and/or purgatives would have weakened him and predisposed him to new infections.

It is also worth remembering that the old expression *hitsiges Fieber* has been variously translated as "fever as convulsion of the soul" or "fever as spasm of the blood vessels accompanied by tachycardia."[17]

Bach was buried anonymously, as was Mozart, 3 days after his death, in a grave without any obvious stone or mark, near the St Johannes Kirche in Leipzig. When the church was rebuilt in 1894, the alleged mortal remains of Bach were reburied in the church itself. After this church was heavily bombed during World War II, the alleged remains were moved to the St Thomas Kirche in Leipzig, where they still remain.

One can only speculate about the fate of this great composer. The only inarguable fact is the body of music Bach left us, sounding still as fresh today as it did the day he put it on paper. Whatever eye diseases Bach might have suffered during his life, they never stopped him from creating divine music.

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