

Beethoven's terminal illness and death

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ABSTRACT There is dispute about the cause of Beethoven's death; alcoholic cirrhosis, syphilis, infectious hepatitis, lead poisoning, sarcoidosis and Whipple's disease have all been proposed. In this article all primary source documents related to Beethoven's terminal illness and death are reviewed. The documents include his letters, the report of his physician Andreas Wawruch, his *Conversation Books*, the autopsy report, and a new toxicological report of his hair.

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His terminal illness was characterised by jaundice, ascites, ankle oedema and abdominal pain. The autopsy data indicate that Beethoven had cirrhosis of the liver, and probably also renal papillary necrosis, pancreatitis and possibly diabetes mellitus. His lifestyle for at least the final decade of his life indicated that he overindulged in alcohol in the form of wine. Alcohol was by far the most common cause of cirrhosis at that period. Toxicological analysis of his hair showed that the level of lead was elevated. During the eighteenth and early nineteenth centuries, lead was added illegally to inexpensive wines to sweeten and refresh them. These findings strongly suggest that liver failure secondary to alcoholic cirrhosis, associated with terminal spontaneous bacterial peritonitis, was the cause of death. This was complicated in the end stages by renal failure. If the presence of endogenous lead was verified by analysis of Beethoven's skeletal remains, it would suggest that the lead was derived from wine that he drank. Lead poisoning may account for some of his end-of-life symptoms. There is little clinical or autopsy evidence that Beethoven suffered from syphilis.

KEYWORDS Alcoholism, Beethoven, cirrhosis, history of medicine, lead poisoning, terminal illness

DECLARATION OF INTERESTS No conflict of interests declared.

Since Beethoven's death in March 1827 at the age of 56 years, his health and the cause of death have been the topic of extensive debate. Much of the health data is derived from Beethoven himself. He was an inveterate letter writer and he frequently refers to health in his correspondence.¹ Additional information is available from the writings of his friends and his physicians. These indicate that, in addition to gradually progressive hearing loss, he had problems affecting his vision and gastrointestinal, respiratory, and musculoskeletal systems. He also experienced periodic psychiatric problems throughout his life.²

Most of his physicians' notes and reports have disappeared, but some crucial ones are extant. These include the narrative report of Dr Andreas Wawruch, the physician who treated him during his final illness. There are a handful of letters addressed to Beethoven by his physicians, some medical interviews conducted with the aid of his *Conversation Books*,³ and the autopsy report, the original written in Latin.

The aim of this paper is to describe Beethoven's final illness, to present a new translation of his autopsy report,

and to interpret the clinical and pathological findings in the context of a recent toxicological analysis of his hair.⁴ The source materials are his letters, Wawruch's report,⁵ the *Conversation Books* and the autopsy report. There are also two eyewitness accounts written by contemporaries, Anton Schindler and Gerhard von Breuning who were in attendance during much of his terminal illness, although these add little descriptive material.^{6,7} Only the terminology used by the original primary source observers, in English translation, will be used.

BEETHOVEN'S TERMINAL ILLNESS

During the autumn of 1826, Beethoven spent ten weeks on the country estate of his brother Johann at Gneixendorf, about 60 Kms from Vienna. He returned to the city on the 1–2 of December and spent the night of the 1st en route at an inn. Beethoven caught a cold on this trip, and after arrival developed symptoms of a dry 'hacking' cough, thirst, and 'cutting' pains in his sides. Wawruch saw him three days later, by which time he had 'symptoms of inflammation of the lungs'. He 'spat' blood, his respirations 'threatened suffocation' and he had a

'painful stitch' in his side that made lying on his back difficult. Because of a 'lucky crisis' his symptoms improved on the seventh day, and he was able to get out of bed, walk, read and write. A few days later he developed vomiting and diarrhea, and his 'whole body' became jaundiced. He developed severe abdominal pain, swelling of his feet, 'dropsy' and 'violent anger', and he had 'nocturnal choking attacks'. Because of progressive abdominal swelling caused by the accumulation of fluid, a paracentesis was performed with initial good symptomatic relief. The paracentesis was repeated on three further occasions during the remaining three months of his life.

In mid-January 1827, Anton Schindler, who was Beethoven's secretary, arranged 'a Council of Physicians' meeting at which frozen punch, containing alcohol, was recommended. This resulted in good symptomatic improvement, and he 'became cheerful and full of witty comments'. According to Wawruch, however, he began to 'abuse' the prescription, grew 'soporously', and breathed 'stertorously', like an 'intoxicated person', so Wawruch discontinued the punch. Subsequently his condition deteriorated. He became depressed, frustrated, and emaciated, and had increasing difficulty in concentrating. In late March, Wawruch and Beethoven's friends, with his approval, arranged for a visit by a priest for the last rites of the Church. Some bottles of Mainz wine were later brought to him as gifts and placed on his bedside table. He looked at them and murmured, 'Pity, pity – too late'.⁸ These were his last words. He lost consciousness, became delirious, and expired late in the afternoon of 27 March 1827, in the midst of a thunderstorm.

The above description is taken principally from Wawruch's report, but some data can be added from other sources. Beethoven himself refers on two occasions to having dropsy,^{9, 10} and he describes weakness,¹¹ insomnia,¹² and distress at his inactivity.¹³ In none of his letters does he refer to having pain. There are references to bedbugs that interfere with sleep,¹⁴ and bedsores.¹⁵ Although not mentioned directly in any primary source, it may also be that he suffered from anaemia due to poor nutrition and bleeding from possible esophageal varices, although the presence of varices was not mentioned in the autopsy report.

THE AUTOPSY

On the day following his death, a Dr Seibert performed an autopsy.¹⁶ The following is a recent translation from the Latin original.¹⁷ For the purpose of clarity, I have provided subheadings that were not in the original report.

BEETHOVEN'S AUTOPSY REPORT

General appearance

The body of the deceased was emaciated, and the

skin was dotted with black petechiae especially at the extremities; the abdomen was swollen and the skin was stretched because of fluid in the abdominal cavity.

The external ear

The aural cartilage appeared large and was of irregular shape; the fossae of the helix (scapha) and the concha were larger and deeper than usual by about one half. The crura and notches were more prominent than usual. Shiny scales of skin lined the external auditory canal, especially around the tympanic membrane, which they concealed.

The middle and internal ear

The Eustachian tube was thickened, and its mucus membrane was swollen, but it became shrunken near its bony section. The mastoid process was sectioned and a vascular membrane lined the cellular structures within. Similarly, the petrous bone was covered by many blood vessels, especially towards the cochlea. The membranous part of the spiral lamina of the cochlea appeared redder than usual.

Both facial nerves were thickened. On the other hand, the two auditory nerves were wrinkled and lacked a central core. The auricular arteries encircled the auditory nerves, and were larger in size than a crow's feather. They also were cartilaginous. The left auditory nerve was much thinner than the right nerve, and had three dull white streaks on its surface; the right auditory nerve had a thick white streak of a substance having a dense consistency. It was vascularized as it curved around the floor of the fourth ventricle.

Brain and cranium

The convolutions of the brain were softer and moister, and appeared to be deeper and more numerous than usual. In general, the bones of the cranium showed increased density and were almost one half inch thick.

The thorax

The thoracic cavity, and the organs it contained, appeared normal.

The abdomen

The abdominal cavity was filled with four quarts ['measures'] of a reddish, cloudy fluid. The liver was half of its usual size. It was compact and leathery in consistency, blue-green in color, and its surface was covered by nodules the size of a bean. Its vessels were very narrow and thickened and there was no blood in them. The gall bladder contained a dark colored fluid, and much gravel-like sediment.

The spleen appeared twice its usual size, and was compact and black in color.

The pancreas also appeared larger and more compact, and the end of the pancreatic duct was the width of a goose feather.

The stomach and the intestines were both distended with air.

Both kidneys were pale red and soft in consistency. They were covered by cellular tissue about one inch in thickness, and this tissue was filled with a dark cloudy fluid. In each calyx there was a calcareous concretion approximately the size of half a pea.

RECENT HAIR ANALYSIS

A toxicological analysis on a lock of Beethoven's hair was carried out in 1996.^{18a} The origin and epic wanderings of this lock, taken shortly after he died, have been described.¹⁸ It was acquired by a group of investigators from the US, and they arranged for a few strands of the hair to be analysed chemically.⁴ This showed that the hair did not contain opiate derivatives, mercury or arsenic, a finding that is consistent with Wawruch's report that Beethoven refused most medications during his final illness. However, the analysis did show that the hair contained an average of 60 parts per million of lead. The authors concluded that Beethoven had 'plumbism' (lead poisoning) and that this had contributed to his death. They speculated that the lead could have originated from drinking mineral water at spas, and/or from dishes or wine stored in lead-lined flasks or crystal.

INTERPRETATION

Clinical data

The symptom complex associated with the onset of Beethoven's terminal illness – cough, hemoptysis, pain in his side, and fever lasting seven days, with improvement following a 'crisis' – is consistent with pneumonia. Beethoven smoked a pipe, and had had a productive cough over the previous few years. This may have predisposed him to pneumonia when his resistance was lowered by exposure to the elements during his return to Vienna from Gneixendorf.

The onset of jaundice is consistent with liver failure, probably precipitated by the pneumonia. Five and a half years previously Beethoven had had a six-week episode of jaundice and this attack appeared, from his own description, not to have been associated with pain.^{19, 20} Ankle oedema and abdominal ascites developed with the second attack, suggesting a metabolic cause for his liver failure. The 'painful stitch' in his side that prevented him from lying on his back was likely pleuritic and related to his pneumonia. The later occurrence of 'severe abdominal pain' may have been intestinal, hepatic, pancreatic or renal

in origin. No further details are provided about its character or location. Later, Wawruch mentions that Beethoven had 'colic and diarrhea' but does not provide additional details. Wawruch does not describe the stool character, but it may have been melena from esophageal varices, if the latter were present. The absence of blood in the gastrointestinal tract at autopsy indicates that, if varices were present, bleeding was not the immediate cause of death.

The episodes of 'nocturnal suffocation' are suggestive of paroxysmal nocturnal dyspnoea caused by fluid accumulation in the lungs. It appears that neither the pain nor the dyspnea continued, although the jaundice and ascites were progressive until death. Difficulty with concentration suggests some cognitive dysfunction but otherwise his consciousness remained clear until a few days before he died.

Autopsy data

The most striking abnormalities were found in the abdominal cavity. The peritoneal cavity was filled with fluid which was described as 'cloudy' and 'reddish'. This strongly suggests that a terminal spontaneous bacterial peritonitis associated with some bleeding was present. Peritonitis, therefore, was likely the immediate cause of death. This is common in end-stage liver failure. The causative organism could have come from the respiratory tract, reaching the peritoneum via the blood stream. The liver was reduced in size, had a compact and leathery consistency, was 'blue-green' in colour, and its surface was covered in bean-sized nodules. These features, including the 'bean-sized' dimension, is consistent with micronodular cirrhosis. The spleen was twice its normal size indicating that portal hypertension was likely present. The autopsy does not describe oesophageal varices, but if the spleen was enlarged due to portal hypertension, it is possible that varices were present, but not observed.

The pancreas was larger than normal, and firm in consistency, and the kidneys were embedded in 'cellular tissue' one inch in thickness, filled with a dark cloudy fluid. Each calyx contained a small calcareous concretion. The changes in the pancreas may indicate pancreatitis, and Davies considered that those in the kidney were pathognomonic of renal papillary necrosis.²¹ He felt that Beethoven probably also had diabetes secondary to pancreatitis. However not all medical historians support this conclusion.²²

Abnormalities were also found in his cranium, the bones of which were noted to show increased density and were thicker than normal. It has been suggested, originally in 1927 by Neumann, and subsequently by others, that these are the changes associated with Paget's disease.²³ Although Beethoven may have had Paget's disease, it is an unlikely cause of his deafness because this started in his

late twenties, well before the usual age at which Paget's disease first presents.

Liver cirrhosis

During the nineteenth century, alcohol misuse was by far the most common cause of cirrhosis. Some medical authors have suggested that the cirrhosis may have been post-hepatic.^{24,25} This is improbable because hepatitis B and C, the types that can cause cirrhosis, was not known to exist before the twentieth century. The mode of transmission of these two viruses is most commonly by percutaneous penetration, such as occurs with needles and blood transfusion, and these techniques were not used during the early nineteenth century. If a virus had caused the earlier episode of jaundice that Beethoven experienced in 1821, it would have been hepatitis A, and infection with this virus does not result in cirrhosis. Although hepatitis A infection is possible, it appears more probable that the 1821 attack of jaundice was caused by alcohol-induced hepatitis.

There is much evidence that Beethoven misused alcohol. The *Conversation Books*^{26, 27} and his letters^{28, 29} contain frequent references to his enjoyment of, and need for wine. The four physicians who treated him during the last 20 years of his life, Drs Staudenheim,³⁰ Malfatti,³¹ Braunhoffer³² and Wawruch³³ all advised him to reduce or stop drinking wine and he was not able to do so. The alcohol-containing punch that he was given during his final illness provided good symptomatic relief suggesting physiological habituation. He probably had chronic pancreatitis and renal papillary necrosis, and possibly also diabetes mellitus during his final illness and these also may have been alcohol-related.

Lead toxicity

What role (if any) did lead poisoning play in his demise? It is possible that the lead found in his hair was a contaminant from compounds used for hair washing, or for cleaning and preparing the body for burial after death. The only method to verify whether it was derived from ingestion before death would be to carry out a lead assay of his skeletal remains, because 90% of lead taken into the body is deposited in the bones. To my knowledge this has not yet been done.

There are difficulties in interpreting the results of hair-lead analysis. Trace element analyses of human hair are known to show wide discrepancies depending on the number of hairs analysed, and the level (distance from the root) at which the hair analysis was carried out.^{34–37} There is not always a good correlation between hair and blood level concentrations, and blood lead levels do not necessarily correlate with symptoms of lead poisoning.³⁸ The lead content of an organism is in a dynamic state determined by complicated kinetics, and

influenced by absorption, excretion and other physiological parameters.³⁹

The difficulties of interpreting the significance of high levels of trace elements in hair are well illustrated by the case of Napoleon Bonaparte.⁴⁰ Arsenic was found in his hair, and it was alleged that he had been poisoned. However, Hindmarsh showed that this allegation was not tenable, even though larger samples of Napoleon's hair were available for analysis than was the case with Beethoven. He considered that the arsenic probably originated from post-mortem contamination.

Beethoven did have many of the symptoms of lead poisoning, in particular colic and alternating periods of diarrhoea and constipation. He likely also had anaemia during his terminal illness, but there is no evidence that he had encephalopathy, at least until the last few days of his life, or wrist drop due to radial nerve palsy. It appears very unlikely that he would have had chronic lead poisoning over a 30–40 year period without causing these neurological features. Because of their long duration, it appears more likely that Beethoven's bowel problems were caused by other factors, such as irritable bowel syndrome or laxative abuse, possibly aggravated by lead poisoning only towards the end of his life.

Although there is reference in the literature to lead affecting the function of the olfactory and facial nerves, there is no reference to it interfering with auditory nerve function. It is highly improbable therefore, that lead was a cause of his deafness.

The toxic effects of lead were known in the early nineteenth century. In a monograph devoted to this topic, François Merat reviewed 57 cases of lead poisoning of whom five died from the condition (8.8%).⁴¹ Most worked as painters, but he referred also to poisoning from inhalation of toxic fumes. One chapter in his book is devoted to lead poisoning resulting from drinking wine that had been adulterated with 'litharge' (lead oxide). Apparently, during the eighteenth and early nineteenth centuries, wine merchants would illegally add lead oxide to wine to sweeten and freshen it. Merat describes an experiment in which he purchased a bottle of cheap wine that had gone sour, but became drinkable the day after lead oxide had been dissolved in it.

If it was shown by bone analysis that Beethoven's hair-lead was derived from ingestion before death, it likely originated from wines that had been adulterated with lead. This would be consistent with the conclusion that he drank wine in excessive quantities.

Syphilis

There has been much debate as to whether or not Beethoven suffered from syphilis.⁴² Hayden considered

that Beethoven's 'high risk' behaviour of consorting with prostitutes, and the multiplicity of his health problems made this very likely. She referred to a secondary source that cited William Osler stating that Beethoven had syphilis.

Not all scholars agree that Beethoven consorted with prostitutes.^{43,44} Beethoven had very few of the clinical and pathological features of this condition. For example, there is no mention that he had genito-urinary or skin lesions indicating infection during the primary or secondary stages of the condition. The autopsy makes no mention of gumma-like lesions or of macroscopic involvement of the brain, meninges or heart and major arteries, and Wawruch does not mention syphilis in his report. Despite an intensive search with the assistance of two Osler scholars, I was not able to find an original citation by Osler that Beethoven had syphilis. If such a reference were found, one would need to know the evidence that Osler was using, in particular whether he had access to information about Beethoven's medical problems that is not available to us.

Sarcoidosis⁴⁵ and Whipple's Disease⁴⁶ have also been proposed as possible causes of Beethoven's death.

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- 3 The Conversation Books are the writing pads that Beethoven used to communicate with others when speech was no longer audible to him. Questions or comments were written in the pad and he would reply verbally. His comments and replies are therefore not available. The complete writing pads are available only in German: *Ludwig van Beethovens konversatione hefte*. 9 vols. Leipzig: Deutscher Verlag fur Musik, 1976. A partial French translation is available: Prod'homme J-G. *Cahiers de conversation de Beethoven*. Paris: 1946. The extracts cited in this text represent my translation from the French edition.
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Sarcoidosis is unlikely because of the apparent absence of pulmonary, skin and lymph node involvement, and the rarity of terminal liver failure in this condition. Although Beethoven had multisystem involvement consistent with Whipple's disease, death in this condition results from malabsorption or infection rather than from liver failure, hence it is improbable that he had Whipple's disease. Both Davies²¹ and Keynes²⁵ in their comprehensive recent reviews of this field, considered that sarcoid and Whipple's disease were an unlikely cause of his death.

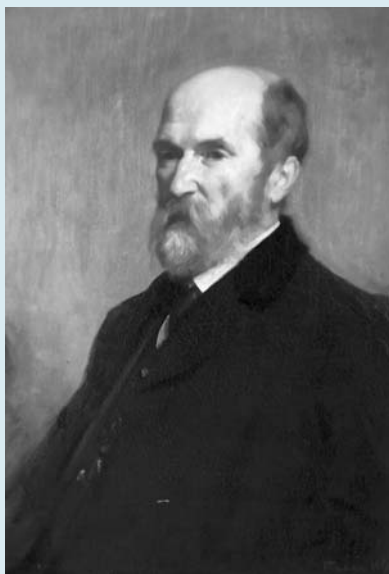
The clinical and autopsy evidence supports liver failure due to alcoholic cirrhosis, complicated in the terminal stages by spontaneous bacterial peritonitis, as being the cause of Beethoven's final illness and death.

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- 16 The assistance of Father Frank Morrissey OMI of St Paul University, Ottawa is gratefully acknowledged in the translation of the autopsy report.
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- 30 Wawruch writes in his final report: 'Dr Malfatti aided me with his advice. [He was] a friend of Beethoven's for many years and aware of the latter's inclination for spirituous beverages'.
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PAST PRESIDENTS

Sir Thomas Smith Clouston (1840–1915)

Clouston was born in Orkney into a family able to trace its history since the first millennium. He was educated at Aberdeen Grammar School and Edinburgh University where his teachers included Goodsir, Syme, Simpson and, in particular, Laycock. Laycock was Professor of Medicine who gave a

series of lectures on mental illnesses, in which he sought to improve the care and treatment of conditions about which very little was known or understood at that time.

A brilliant student, Clouston graduated MD with gold medal in 1861, his thesis being on the nervous system of the lobster. He immediately started work with psychiatric patients, serving as an assistant to Dr Skae Superintendent of the Royal Edinburgh Asylum since 1846, after which, aged only 22, he was appointed Superintendent of Westmoreland Asylum, Carlisle. Ten years later he returned to Edinburgh as Physician Superintendent of the Royal Edinburgh Asylum where, in 1894, he oversaw the building of Craighouse with its great hall, and wonderful views over Edinburgh, a far cry from the squalid Bedlam whose last inmates had been moved to the new hospital in 1844. He gave the Morison lectures, some of which he had written, on behalf of Skae who was ill. His lectures were described as brilliant and he soon found himself appointed as the first University Lecturer in Mental Diseases. His many papers and

books are credited with changing the attitude of the medical profession to psychiatric illness and earning him international acclaim. Even his annual reports to the Asylum directors were given wide press coverage, probably helping to change society's attitudes as well as the profession's.

He was President of the College 1902–4, was awarded honorary degrees by Edinburgh and Aberdeen Universities and, in 1911, was knighted during King George V's annual visit to Edinburgh. The honour which most pleased him, however, was being made Freeman of the town of Kirkwall in his beloved Orkney.

Until the 1990s his most visible memorial was the Thomas Clouston Clinic in Craighouse, described above, a psychiatric unit that more resembled a Scottish baronial mansion than a hospital. It was sold in 1994 and is now a campus of Napier University.

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