



Medical history: news about Beethoven, Empress Elisabeth, and Maximilian II

Roland Sedivy

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On one hand, this special issue deals with historical, but not ancient, specimens that have been stored in Vienna's Narrenturm as a pathological-anatomical collection for almost two centuries. Interestingly, there is no specific term for that period of time. Therefore, such studies belong to the specific field of paleopathology, which is actually concerned with the prehistoric and ancient remains of human and animal tissues. The author of these lines used the term "cenopathology" instead [1] some time ago, which is derived from the New Earth Age, the Cenozoic. Cenopathology may therefore deal with specimens from the past hundred years; paleopathology, however, with those from the past thousands of years.

In the first article, Winter et al. have undertaken a study to categorize the immense number of cenopathological specimens of the Vienna pathological-anatomical collection in the Narrenturm of the Natural History Museum in Vienna. A historical overview of the collection can also be found in this article.

The subsequent articles deal with the great musician Ludwig van Beethoven (1770–1827), to whom the *WMW* dedicated a special issue in his anniversary year (December 17, 2020, his 250th birthday), which was published in 2021 [2]. This year we will also be celebrating the 200th anniversary of the first performance of the 9th Symphony on May 7, 2021. Today the European Anthem, also known as Ode to Joy, is a piece of instrumental music adapted from the prelude of

the final movement of Beethoven's symphony No. 9 composed in 1823.

The article about Beethoven by colleague Dr. Reiter deals with the skull fragments that supposedly belong to the brilliant composer. These were donated by Paul Kaufmann to the Medical University of Vienna in July 2023. He had once taken over the fragments from his mother's estate, who, in turn, had received them from the estate of her great-uncle Franz Romeo Seligmann. Franz Romeo Seligmann (1808–1892), Viennese doctor, medical historian and anthropologist, acquired the pieces of bone in Vienna in 1863 during the reburial of Beethoven's bones for study purposes [3]. The bone pieces known as Seligmann fragments will now be included in the rich collections of the Josephinum.

The second article deals with Beethoven's alcohol consumption, which for many years was thought to be the cause of his liver cirrhosis. However, the article herein appeared online before the remarkable work of Begg et al. was published. In this article, Begg et al. decoded Beethoven's genome and were able to distinguish real from fake hair samples of the great musician. They also discovered that Beethoven had a genetic predisposition to liver disease and found DNA from the hepatitis B virus in his hair. His liver cirrhosis undoubtedly stems from hepatitis B, based on a genetic predisposition that increased the harmfulness of his alcohol consumption [4].

The next two articles are dedicated to Persian medicine. Forty-two medicinal plants are described as natural pest control agents. After introducing the pest control properties of each plant, Avicenna explained the appropriate strategies for their use. The other article presents that knowledge of bioterrorism has already existed since antiquity. Biological and toxicological agents were used for legal execution, in battles, or to eliminate political rivals.

Univ.-Prof. Dr. R. Sedivy, MLS (✉)
 Chair of Clinical Pathology und Molecular Pathology,
 Sigmund Freud University Vienna, Vienna, Austria
 Institute of Pathology, Cytology und Microbiology Dr. Kosak
 GmbH, Mariannengasse 14, 1090 Wien, Austria
 roland.sedivy@med.sfu.ac.at; r.sedivy@qm.dr-kosak.at

This is followed by two articles that deal with the fate and illnesses of two Habsburgs: Maximilian II and Empress Elisabeth. Heusinger and Stolberg show that although Maximilian II's medical history and autopsy reports have been preserved, his heart condition was inadequately investigated. In their article they now explain what the ruler suffered from.

The 195th anniversary of the death of Empress Elisabeth was on September 10, 2023. In the article of the author of these lines, her death is reconstructed and reassessed. Using the post-mortem report, the partial autopsy of the thorax and heart was recreated to show, e.g., the puncture canal. In addition, the entire autopsy findings are presented in English for the first time in a scientific medical journal.

Finally, colleague Dr. Flamm draws attention to the findings of Edwin Klebs (1834–1913) that have not been taken into account. Klebs was one of the first to point out the infectious genesis of wound diseases, even before Robert Koch (1843–1910) and Theodor Billroth (1829–1894). Klebs also defined the requirements for the first time and named criteria for clarifying and proving the nature of the pathogen.

Conflict of interest R. Sedivy declares that he has no competing interests.

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