

ELISABETH VON MATT (1762–1814), AN ENLIGHTENED PRACTITIONER OF ASTRONOMY IN VIENNA¹

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Abstract: Driven by her personal interest, Baroness Matt erected a private observatory in Vienna, bought and ordered precise instruments and carried out astrometric and geodetic observations at several places in Austria and in western Bohemia. Unfortunately her activities were hampered by the Napoleonic wars and were cut short by her early death.

Keywords: Elizabeth von Matt, astrometry, surveying

1 INTRODUCTION

For many members of the aristocracy of the late eighteenth century it was fashionable to own a telescope and to roam here and there through the night sky—certainly this was a greater pleasure than today, since the sky was dark in those days.

Elisabeth Marie Josepha von Matt, née von Humelauer, was more than just an occasional viewer of the heavens. In this paper we recall briefly what is already known about her (Angetter and Pörr 2009; Bode, 1814; Ma-Kircher and Brosche, 2001; Firneis, 1993; Lindenau, 1816: 116) and then we present some new material. A part of it—especially pictures—was kindly provided by a direct descendant, Mr Kurt Albert of Heidelberg.

In the title of this paper, why do we call Elisabeth von Matt ‘enlightened’? It is because she devoted herself to the rational aspects of our science (including geodesy), to the type of research pursued by professional astronomers at that time, that is, the tedious labor connected with the determination of celestial and terrestrial positions. For these purposes, she erected a

private observatory at her house in Vienna, purchased precise expensive instruments, and received guidance from local astronomers, but especially from Johann Tobias Bürg (1766–1834). At her house in Vienna she erected a private observatory. She carried out surveying operations near Vienna and in western Bohemia. Although she obviously overcame the obstacles of her sex, other adverse circumstances, especially the Napoleonic wars and her fading health, did not allow her to realize her full potential.

2 THE ‘SPECULA DOMESTICA’

Elisabeth von Matt’s house was in the centre of Vienna at Schulerstraße 18-20, on the corner of Kumpfgasse, not far from St. Stephen’s Cathedral. The surviving plans of her house do not show the roof, so we are left in the dark with regard to the design of her observatory. The bird’s eye view of Vienna by Huber drawn in 1778 reveals that almost all of the houses around St. Stephen’s Cathedral had gabled roofs (see Figure 1).

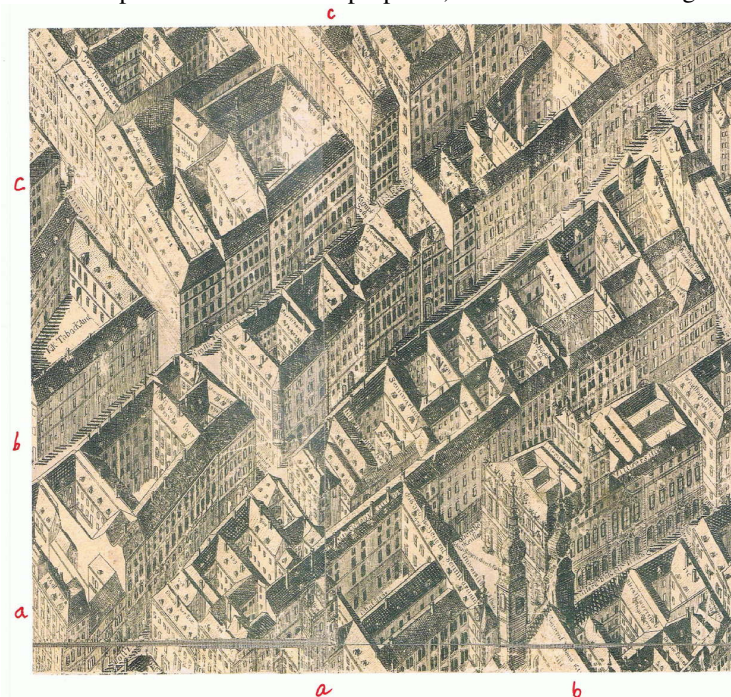


Figure 1: A few decades before Matt bought her house, Huber (1778) drew the area of the observatories discussed here, where (a-a) is the Jesuit Observatory, (b-b) the University Observatory, and (c-c) our choice of the location of Baroness von Matt’s ‘specula’. North is approximately to the right.

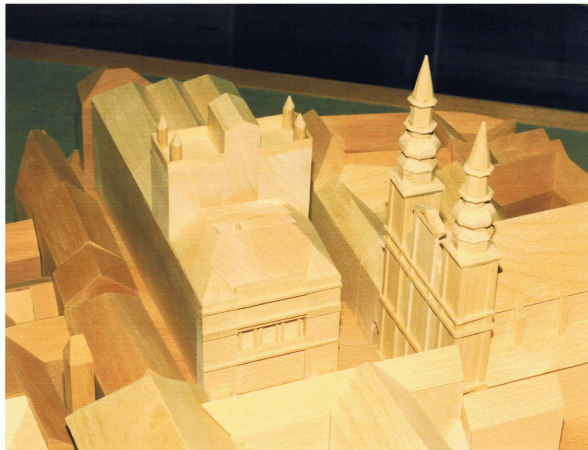


Figure 2: The (old) University Observatory of Vienna (wood model from University Archive, photographed by Franz Kerschbaum).

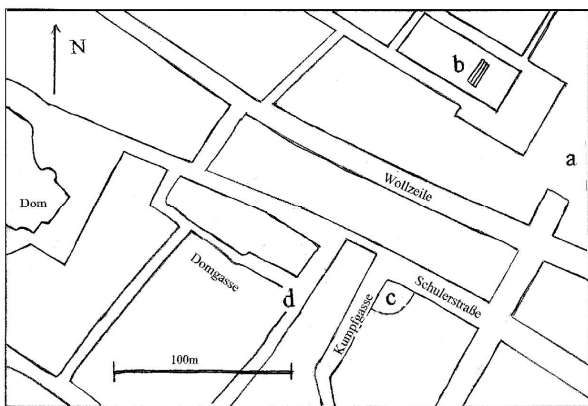


Figure 3: Sketch of the present situation. Meaning of the letters as in Figure 1; in addition Matt's house as derived from the relative coordinates is marked by the 'd'.

Although in theory Matt could have observed from another house—especially one of the few tower houses with flat roofs in the area—we can safely assume that she observed from her own house on the basis that her first published paper (Matt, 1805) refers to her “specula domestica” (= home observatory). Supporting this conclusion is the following statement by Karoline Pichler (1769–1843) that appears in her memoirs:

“... and she [Matt] had erected an observatory in her house.” (Pichler, 1914; our English translation).

The location of Matt’s observatory in Vienna can be identified in two ways. First, we have the information from Harrer’s house register (1950) that around 1800 the building at Schulerstraße No. 18/20 (the modern numbering) belonged to Elisabeth von Matt (and not to her husband). Second, we have the latitude and longitude of her ‘specula’, which are given in the title of her first paper (Matt, 1805); the same values are also cited by Triesnecker and Seeber (1805: 126). The longitude of her observatory is given as $\frac{1}{3}$ of a second of time to the west of the University Observatory which itself was positioned with respect to the nearby Jesuit Observatory (Zach, 1801: 553). According to Zach’s *Monatliche Correspondenz*, Joseph Liesganig’s value of $48^\circ 12' 36''$ was used for the latitude of the University Observatory, although in 1808 Augustin obtained a somewhat different figure (Augustin 1808; 1813; Zach, 1813: 138, 146). Hence the latitude of Matt’s observatory was 4 arcseconds south of the University Observatory. We are perfectly aware of the location of the latter Observatory on the building which at present houses the Austrian Academy of Sciences (see Figure 2) and can therefore pinpoint the relative position of Matt’s observatory on a map of the city.

Irrespective of whether the terrestrial transfer is made by inspection of a map or just by pacing the intermediate streets, the errors of $\Delta\lambda$ and $\Delta\phi$ should be only rounding errors (this would not be true in case of astronomical measurements). For $\Delta\phi$ this is then simply half a second of arc corresponding to ± 15 m. For $\Delta\lambda$ we assume that the given $\frac{1}{3}$ of a second of time means it is between $\frac{1}{2}$ and $\frac{1}{4}$. A second of time in longitude corresponds at the latitude of Vienna to 308.6 m, the $\frac{1}{3}$ second to 103 m and $\frac{1}{2}$ and $\frac{1}{4}$ to 90 m and 120 m. If we use the two coordinate differences and their possible errors for fixing Matt’s position on a map of Vienna we arrive at a place which agrees in the north-south direction with Schulerstraße 18/20 but not so in the east-west direction. As Steinmayr (2010) notes, it would lie at the crossing of Domgasse and Grünangergasse. At present we cannot account for this discrepancy but we would prefer to stick with Schulerstr. 20 since the whole difference relies on that “1/3” which could already be a typographical error. This position is shown as ‘d’ in Figure 3.

We also may refer to an older map of the area which shows the names of the proprietors of the various properties in 1684. According to Harrer (1950) the owner of Schulerstraße No. 18/20 was Maria Katharina Orelli. On the map shown in Figure 4 we find the name ‘Maria Chatharina Aurelin’ which we believe is merely the latinized form of Orelli (the root meaning ‘gold’ in both versions).

The consecutive house numbers introduced in the Josephinic era have been changed twice so that three versions must be recognized. The ones in the Huber (1778) plan belong to the first version, while the ones provided by Harrer (1950) to the last. The number 824 of Harrer corresponds to 840 in the first version. We cannot read a number for our choice of Matt’s house in the Huber plan (the name is ‘Grüne[s] Rößl’), however the next but one building (a ‘Wirtshaus’) to the south-east carries the number 838, thus supporting our identification. According to note 698 in Pichler (1914),

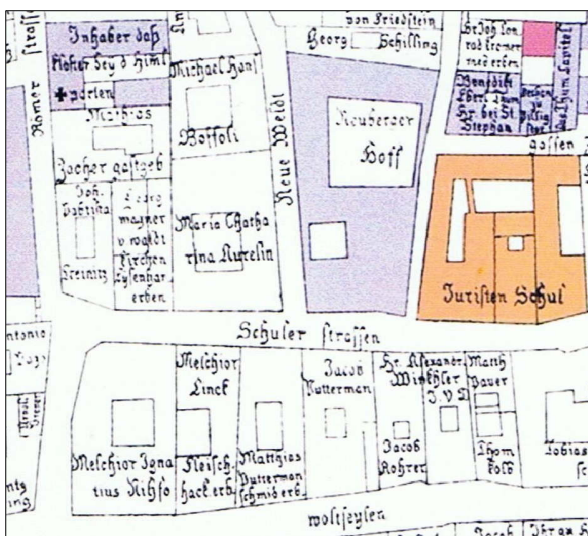


Figure 4: Houses and their owners in Matt’s neighborhood in the year 1684 (after Suttinger, 1684).

Matt's house number was 874.

Further suggestions for the location of Matt's observatory neither fulfil the latitude nor the longitude condition, but may be motivated by the existence of a tower-like part of a building on the Huber plan. If we trust that Huber was precise in the representation of the roofs, even for private houses, then there was no 'tower' on Matt's house before she bought it. But Mr Albert has found a drawing from the inner court and representing the house in the late nineteenth century (Figure 5). It shows a nice turret with windows towards the south, hence well suited for astronomical observations! The name 'Stainhofersches Haus' is another house name collected by Harrer (1950) and goes back to a book printer of the sixteenth century who was perhaps the first owner. The drawing is also reproduced by Kisch (1883), who comments on the ancient nature of the house constituting the corner to the Kumpfgasse.

A 'specula domestica' could be anything from a formal observatory to just an ensemble of a telescope, a clock and an ephemeris. From what we know about Elisabeth von Matt's instruments (see Firneis, 1993 and Angetter and Pörr, 2009), they could be summarized as 'small but beautiful', but it should not be forgotten that her major instrument arrived too late to be useful (see Figure 10 in this paper). At least three items were used after her death: her Arnold chronometer (which is today owned by the Vienna University Observatory); a small (20-inch focal length, lens diameter 29 lines = ~65 mm) Fraunhofer refractor; and a nine-inch multiplication circle from Baumann. The last two items were used by Bürg in 1820 (see Bürg, 1821: 120).

3 ELIZABETH VON MATT: THE PERSON

Kurt Albert (pers. comm., 2010) has compiled a genealogical tree from information passed down through the pertinent families, and according to it Elisabeth von Matt's maiden name was Humelauer. Her paternal grandfather was a tailor, while her father, being a medical doctor, climbed the social ladder and reached the rank of a physician-in-ordinary ('Leibarzt') at the court in Vienna. He was ennobled in 1760 becoming 'Edler von Humelauer'.

From an inspection of the official death records a more precise date of birth for Elisabeth von Matt is obtained than was hitherto known: 20 August 1762. Likewise, we can eliminate the uncertainty over the date of birth of her husband, Ignaz von Matt: he was born on 6 July 1740 in Konstanz on Lake Constance. The age difference of more than 20 years makes the mistake of the 'Wurzbach' (Austrian biography) more understandable, namely referring to Ignaz as Elisabeth's father! Instead, they married on 2 October 1784.² He became a baron (Freiherr) in 1793 and according to the official death records and the *Wiener Zeitung* (1814) he died on 29 July 1814 (not June); he was 74 years of aged. While we presented in our previous paper (Ma-Kircher and Brosche, 2001) evidence for two daughters, we see now that these two had an elder sister, Maria Regina, born in 1786 in Vienna, and, like Wilhelmine, married to a Count Finckenstein. These two Finckensteins were brothers.

Harrer (1950) tells us that Elisabeth von Matt (and not her husband!) bought the house in the Schuler-



Figure 5: The inner court showing Elisabeth von Matt's house. It is presumably the multi-storey tower on the left plus the building at the back with the balconies and gateway. From a drawing by Emil Hütter (1835–1886). Copyright: Wien Museum.

straße on 9 February 1793 and bequeathed it to her daughters Karoline and Wilhelmine, but this is not completely correct. Since Wilhelmine died shortly before her mother, the daughters Maria and Karoline and a son of Wilhelmine inherited the house.³ From them, parts of the house came into the possession of the Finckensteins, the Capellinis and the Pachters von Theinburg before it was razed in 1896. Our informant, Kurt Albert, is a descendant of the Pacher von Theinburg line.



Figure 6: Elisabeth von Matt, née Humelauer (1762–1814), in rococo style during her younger years (reproduced by kind permission of Franz Pacher-Theinburg).



Figure 7: Ignaz von Matt (ca. 1740–1814); one of a pair of miniatures with the painting in Figure 6 (reproduced by kind permission of Franz Pacher-Theinburg).

It is not surprising then that in such families portraits have survived up to the present. With kind permission of the owners we present here portraits of both Elisabeth von Matt and her husband (see Figures 6 to 8).

It seems appropriate to include here also a portrait of Johann Tobias Bürg (1766–1834),⁴ who was the advisor and collaborator of Elisabeth von Matt in her astronomical work (see Figure 9).



Figure 8: Elisabeth von Matt as a middle-aged matron, wearing a kind of Biedermeier (reproduced by kind permission of Franz Pacher-Theinburg).

Zach (1800: 541) and Seetzen (1802: 487) describe some of Bürg's activities. When passing through Vienna in 1802, Seetzen seems to have mentioned all persons there who were at that time actively engaged in astronomy or geodesy, but Elisabeth von Matt is not amongst these. This gives us an earliest possible date for the start of her astronomical activities while her first publication, in 1805, provides an upper limit.

Handwriting is sometimes thought to give insight into a person, so here we present a page from the letter (Figure 10) that Matt sent to the instrument-maker Georg von Reichenbach (1772–1826) in 1809. She had ordered a transit instrument from him in about 1806, and was still awaiting its arrival in 1813 (see Matt, 1813). In order to understand her statements one has to recall that French troops occupied Vienna in May 1809 and that the state of war ended only with the peace of Schönbrunn in mid-October.

Reichenbach had the rank of a captain ('Hauptmann') and Elisabeth's title of 'Reichsfreyin' means baroness (of the Holy Roman Empire). An English translation of part of the letter follows:

... and do not believe that the thunder of cannons and the clash of arms which sent threatening flashes into our eyes, in the least bit interrupted my passion for the noble science [of astronomy].

4 MATT'S ASTROGEODEITICAL WORK

While her first paper (1805) refers to observations of the minor planets Pallas and Juno from her home observatory, all of her subsequent papers originate from other places and mainly deal with astrogodetic work. One can probably associate this with the all-too-long seven year wait for the 6-foot transit instrument ordered from Reichenbach. She may have learned from Zach (with whom she was in contact, e.g. see Matt, 1808) that in the meantime one should not twiddle one's thumbs but could produce a considerable scientific harvest by using small transportable instruments to obtain geographic coordinates of many different places. Matt did this in collaboration with the professional Viennese astronomer, Johann Tobias Bürg, from about 1804 right up until her death (Bürg, 1814). Here we also see a certain parallelism with Zach and his duchess; however, the Duchess of Saxe-Gotha-Altenburg preferred to assist in private while Elisabeth von Matt did not hesitate to appear in public. One could surmise that Bürg performed the complicated reductions of her observations since on page 121 in his introduction to Matt's first 1810 paper Lindenau wrote that Bürg derived the results. On the other hand, Matt (1809) reported that she calculated lunar occultations, and later that she was waiting for Pasquich's book on computational astronomy (Matt 1811a). Her remarks on lunar tables and their coefficients (Matt, 1813) indicate familiarity also with such theoretical aspects. Bürg had only a subaltern position at the University Observatory, hence his cooperation with Baroness Matt may have given him the feeling that he was involved in an independent area of activity. After her death, Bürg (1814: 175) remarked on their ten-year friendship and his feeling of a great loss. He even went so far as to say that she was the only woman who remained his friend during the years when he was deaf.

Matt and Bürg observed at various places in Austria and Bohemia (Figure 11), mainly in connection with

summer vacations or while visiting spas. In Austria, places in the ‘Wiener Wald’ were chosen, as well as Bruck an der Leitha, east of Vienna. The first include the famous Baden south of Vienna, Heiligenkreuz, more inside of the ‘Wald’, and smaller spots like the castles of Araburg und Bergau, and in Fridau, south of St. Pölten. At the Hocheck mountain (1037m), Bürg observed alone, while Matt participated from her possession ‘Rehhof’ to the north.

In Western Bohemia, we notice latitude and longitude determinations for Maria-Culm (a place of pilgrimage), Franzensbad, Elbogen and Engelhaus (represented by nearby Schödel’s inn). West of the border, in Ansbach-Bayreuth (which since 1806 was a part of Bavaria), Bürg operated on the highest mountain of the Fichtelgebirge, the Schneeberg (1051m). In order to determine its altitude, he registered barometer readings there, and before at the nearby town of Weißenstadt. Father David, the leading astronomer of Bohemia, assisted in some of the measurements. He belonged to the order of ‘Kreuzherren’, and they had a central convent in Tepl and the one in Maria-Culm. David earlier had made the acquaintance of Franz Xaver von Zach (1754–1832) in Karlsbad, while Bürg worked with Zach several months on the Seeberg in each of the years 1801 through 1804. Hence Matt’s references to Zach are natural.

In 1810 the editor of the *Monatliche Correspondenz* was officially still Zach, but *de facto* it was his disciple and follower at the Seeberg, Bernhard von Lindenau (1779–1854). He continued Zach’s practice of placing long footnotes under his authors’ text. Supplementing Matt’s first 1810 paper (Matt, 1810a), his multi-page note starts on page 123 and runs until page 128, where he signs it as “v.L.”. In the first part, he reduces Bürg’s barometer observations, arriving at a new and more trustworthy altitude for the Schneeberg (1047 m as compared with the modern value of 1051 m, while the earlier value was 1196 m!). Then von Lindenau reports his own experiences on the neighbouring Ochsenkopf (on pages 126f.). At the request of the French Government he was concerned with a trigonometric connection between his Seeberg and the (Ober-)Pfalz, which had just been transferred by the French to their ally, Bavaria. And Lindenau’s Saxe-Gotha-Altenburg, as a member of the Rheinbund, was also obliged to comply with any wishes of the French authorities. This part of Lindenau’s biography is independently confirmed by his biographers Ebart (1896) and Volger (1896).

Ebart provides a fragment of a diary, which in August 1808 ends with Lindenau’s departure for measurements in the Werra region. The main source of the Werra is not far from the Fichtelgebirge. Volger (1896) then tells us that Lindenau was working in Thuringia and Franconia for the *depot de la guerre* (obviously this institution also took care of the maps). In any case, the bad weather on the Ochsenkopf in October made Lindenau suffer, but not Elisabeth von Matt (who was only in Bohemia during the summer months). But her campaigns also included adventurous elements: when we read that she observed in Maria-Culm beside a charnel-house and a chapel situated on a former robber’s den, it is comforting to note that this was during the daytime.



Figure 9: Johann Tobias Bürg (after *Monatliche Correspondenz* 1 (1800), begin of May issue, facing page 435).

If we compare the considerable intervals in latitude ($\sim 2.2^\circ$) and in longitude ($\sim 4^\circ$) of the two areas in which Matt and Bürg were active with the intervals of measurements of the degree before and around 1800 (Wolf, 1892), we are led to the suspicion that they may have had in mind a modest measurement of a degree. That concepts of a larger scale were under discussion is confirmed by Matt’s reaction to a proposal by Lindenau: “Your proposal to connect the Seeberg with Prague by powder signals seems to me quite feasible.” (Matt 1811a: 294). A list of mountains which could be used as intermediate points follows. The method of

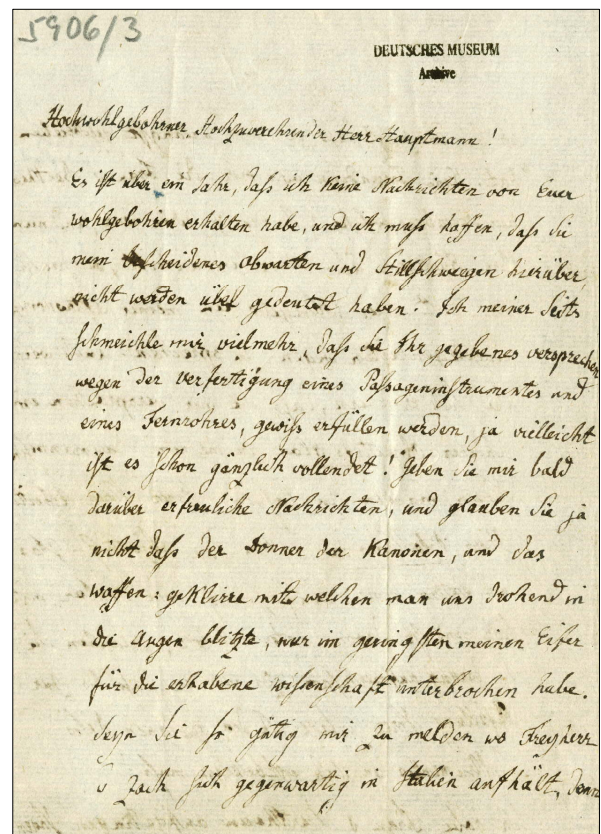


Figure 10: Part of the letter from Matt to Reichenbach dated 30 September 1809 (with kind permission of the Deutsches Museum München; its accession number is HS 05906).

powder signals was subsequently reactivated by Zach in order to transfer local time and determine longitude (see Brosche, 2009: 169ff.)

Elisabeth von Matt furthered astronomy by allowing Bürg, and also F.W. Seeber from Karlsruhe, to use her Vienna observatory (see Triesnecker and Seeber, 1805). She also assisted with the exchange of books (Matt 1808; Triesnecker, 1807) and the ordering of instruments (Matt, 1808: 261), and her astrogeodetic data were later used by Wurm (1827).

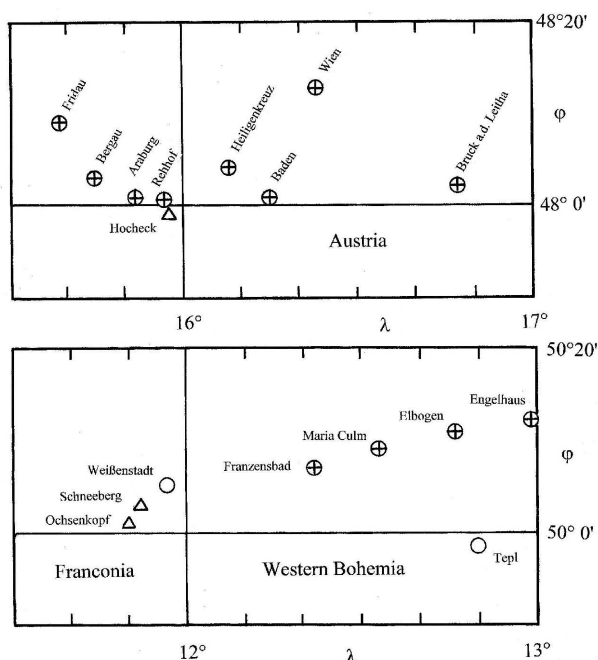


Figure 11: Diagrams showing the latitude and longitude of places in inner Austria and in western Bohemia surveyed by Elisabeth von Matt (circles with crosses). Other towns mentioned in the text are shown as open circles, and mountains whose altitudes were determined by Bürg and von Lindenau as triangles.

The wider interests of Elisabeth von Matt are best characterized by a full quotation from Karoline Pichler's (1914) memoirs, which are given here in translation:

Already quite some time ago we had presented in our house plays by Goethe, Schiller, and others with much delight. Now, in March 1813, it was decided to read "The Bride of Messina" [a drama by Schiller] at the house of Baroness von Matt, a very learned, even erudite lady, who occupied herself with astronomy and had built an observatory in her house. Once every week the same circle of mutual friends gathered with this lady, among them very literate ladies and several excellent scholars were found, like Hammer, Schlegel, Adam Müller, a circle that had gathered in the past in the house of my departed lady friend Flies. Baron Hormayr and a Mr. Rupprecht, who himself was a brave poet, had taken over the roles of the two sons; a very pretty lady, to whom a very vivid interest in one of these gentlemen was ascribed, should read the role of Beatrice, and I myself the role of the mother.

The minor planet 9816 von Matt named in her memory was discovered in 1960 by C.J. van Houten and I. van Houten-Groeneveld on Palomar Schmidt plates. The name was suggested by Hermann Haupt of Graz.

5 NOTES

1. This paper is dedicated to Hermann Haupt (Graz) on

the occasion of his 85th birthday.

- Information kindly provided by Domarchivar Reinhard Gruber. The reference is: Domarchiv St. Stephan, Vienna. Trauungsbuch der Dompfarrei St. Stephan zu Wien, Tomus 75, folio 238 recto.
- Verlässenschaftsakten* in *Allgemeines Verwaltungsarchiv* of the *Österreichisches Staatsarchiv*. This was partly destroyed by the great fire of 1927.
- Since the day and the year of the death of Bürg vary in the literature (without an authority), it may be welcome here to quote the information from the diocesan archive in Klagenfurt (Mag. Ch. Salcher, letter dated 10 June 2010): Bürg died 25 November 1834 from pneumonia.

6 ACKNOWLEDGEMENTS

We are indebted to Mr Kurt Albert for generously sharing with us the results of his genealogical investigations.

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