

## A PREVIOUSLY UNKNOWN METEOROLOGICAL PUBLICATION OF GREGOR J. MENDEL FROM 1857

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*ABSTRACT - Gregor J. Mendel is today best known for his discovery of the so-called Mendelian laws that he published in a long article in 1866. Most of his scientific papers however deal with meteorological topics. Of his overall 13 known articles written by him, 9 are devoted to meteorological or climatological observations. Since the first compilations of his work, this basically formed the core of his scientific publication work without any significant contributions extending the list. Here we report on an additional article that he published in 1857 reporting on a thunderstorm he observed in Brno on Friday, 7<sup>th</sup> August.*

Gregor J. Mendel is today best known for his experimental work and his subsequent and now famous article in which he presented a statistical analysis on crossing of different pea varieties which differed in binary traits.<sup>1</sup> This publication eventually resulted in the formulation of the so-called Mendelian Laws and subsequently laid the foundation for the new discipline of Genetics. It is therefore easy to think of him as a hobbyist scientist who rarely published results of his scientific studies and who did not publish as intensely compared to other 19<sup>th</sup> century researchers.<sup>2</sup> This is however somehow misleading. Already his list of primary research so far contained several known articles<sup>3</sup> with additional research of him published as part of research articles by other scientists.<sup>4</sup> Furthermore, it is known that Mendel published under various author abbreviations a large number of minor reviews, which have been only rarely mentioned in the literature. However, the core list of Mendel's scientific publications has not seen any addition in at least half a century.<sup>5</sup>

It was therefore a surprise when we discovered an additional article by Gregor Mendel in an issue of the *Brünner Zeitung*.<sup>6</sup> Published on Tuesday, 18<sup>th</sup> August 1857, Mendel therein describes his observations of a thunderstorm in Brno (Brünn) that occurred on Friday, 7<sup>th</sup> August and had been accompanied by large torrents of rain.<sup>7</sup> In style and form the short articles shows large similarity with his later articles on observations of storms from the 1870s and 1880s.<sup>8</sup> Most famously among those articles is Mendel's detailed description of the occurrence of a tornado that caused considerable damage in his hometown Brno. Based on this the article itself on a first glance is only

a minor addition to Mendel's work as his interest in meteorology was already well known. However, the article itself is in such of interest as it allowed us to reconstruct how Mendel became interested in such kinds of descriptive observations of natural phenomena. First, it highlights that Mendel's interest in meteorological observations continued for nearly 30 years ending only shortly before his death in 1884, when he was still performing on weather measurements in the abbey of Old Brno. Second, it shows that Mendel described a kind of whirl wind already thirteen years ahead of his meteorological most famous contribution from 1871.<sup>9</sup> Third, a contextual analysis of the local publications of 1857 allowed us to locate the probable origin for this kind of observations of natural meteorological phenomena by Mendel. His article very likely was a direct response by him to an article published shortly before by Carl Schwippel, who was working as teacher in Brno.<sup>10, 11</sup> In this article Schwippel, as a representative of the natural history section of the Moravian and Silesian Agricultural Society in Brno, asked "*all friends of natural sciences*" to report on unusual and "*special natural phenomena*". In particular, Schwippel wrote that he was interested in atmospheric observations such as heavy thunderstorms, rapid negative effects of weather on the vegetation or the occurrence of field pests such as unusual numbers of mice or insect-swarms. Mendel's report took up the very first of those topics and therefore seems to be a direct reply to Schwippel's request.

In the follow-up there has been a continuing collaboration between Mendel and Schwippel. The latter at the time had offered to work on several years of meteorological observations made by Paul Olexik<sup>12</sup> in Brno. Shortly afterwards, Mendel by latest December 1857 had agreed and promised to produce graphical representations of those measurements for the year 1856.<sup>13</sup> The described episode seems to have been the start of Mendel's active involvement in meteorological studies. Mendel would later continue for many years to compile overviews of meteorological observations of Moravia and Silesia that were sent to Brno.

Eventually it is quite remarkable that the article was not discovered earlier, as the thunderstorm of August 1857 was also mentioned in Mendel's later and somehow famous article on the occurrence of a tornado in Brno.<sup>14</sup> The reason very likely was caused by the fact that it was printed in a local newspaper. The only reference that we found on the thunderstorm in relation to Mendel in the literature after 1900 is a short mention in a summative list of newspaper articles from Vienna that briefly discussed Mendel's observations.<sup>15</sup> In any case the newly found report by Mendel is also an addition to the list of historical tornadoes that have been observed in the Czech lands since medieval times.<sup>16</sup>

## CONCLUSION

The newly found first meteorological article by Gregor Mendel sheds a new light on the early stages of his life-long work in the field of meteorology and the beginnings of the scientific collaboration between Gregor J. Mendel, Paul Olexik, and Carl Schwippel in the 1850s, which occurred in parallel to the early stages of Mendel's crossing experiments.

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## **APPENDIX: ON THE THUNDERSTORM IN BRNO ON THE 7<sup>th</sup> AUGUST 1857<sup>17</sup>**

### By GREGOR J. MENDEL

The imperial Central Institute for Meteorology<sup>18</sup> is grateful for receiving from the capitular Gregor Mendel, the following report on the outbreak of a thunderstorm over Brno, which hit the city at the 7<sup>th</sup> of the current month, which due to comparison to already published news gains a special interest:

“On Friday the 7<sup>th</sup> of the months at noon there were all sign to soon expect rainfall. Already at 2 o'clock vesp. a heavy thunderstorm stood on the northern sky, yet without approaching the city closer to a mile. At this time, it was noted at the barometer: 320,70 Parisian Lines (Minim.), thermometer: +26.0 R, vapor pressure: 6.91 Par. L., humidity: 43 %, clouds: FH<sub>0</sub> from WSW, wind: WSW<sub>4</sub>.

At 3:30 o'clock vesp. a deep black thundercloud arose, surrounded by high towering cumulus, over the western horizon and approaching quite fast. A few minutes before 4 o'clock the first raindrops came and afterwards for 10 minutes a medium rain, accompanied by thunder, fell while it was mostly calm and windless. Suddenly, a violent blow came from the west, that was followed by further wind blows from all direction of heaven, so that one could see the wind vane rotating in an uninterrupted dance; after ca. 40 seconds it came to rest pointing from the east. Simultaneously the clouds dropped true floods of water. (The writer does not remember to have ever seen something similar.) – With the storm ceasing, the down pour changed into a dense but calm thunderstorm rain, which after 20 minutes again was interrupted by a whirling hurricane<sup>19</sup>, which together with the terrible rain downpour, which accompanied him again, for 25 seconds. The wind vane once again came to rest from the east and maintained this direction of nearly complete calm throughout the whole turn of the storm, which only ended at 6:15 p.m.

Already in the first half hour the lower situated alleyways of the suburbs were flooded, and particularly those at the feet of the Spielberg. More than 30 houses had to be evacuated by their inhabitants and they were partly damaged so much, that their demolition will become necessary. The devastation of gardens, on fields etc. are very considerable; there was also the loss of one human life. The amount of rainfall in the mere span of 2 L hours reached the certainly rare height of 40.35 Par. Lin. – At half past 7 a new thunderstorm arrived from the west, which also hit part of city and continued until 11:30. The overall rainfall during this time amounted to 2.12 Par. L. The total precipitation of the day thus amounted to 42.47 Par. L., thus as much as the previous 105 days (starting from the 25<sup>th</sup> April, the snowy Markus day), together. – Despite the substantial cooling there was another thunderstorm on the 8<sup>th</sup> (10 o'clock man.), yet, without much rainfall (0.62”). Clouds approaching from west, wind direction from SE.

Yesterday on the 9<sup>th</sup> clouds and winds came from E. At 10:15 man. A heavy storm [occurred], that caused no less destruction in alleyways of the suburbs north of the Spielberg, as was the case of that on the 7<sup>th</sup>. The weather unloaded over the near Yellow Mountain with such a force, that the down pouring floods in a first impact crashed down fences and stonewalls before entering with a horrific uproar into the houses. Simultaneously a thunderbolt hit the roof of the institute for blind, yet without ignition. At 2 o'clock and 7:30 vesp. further thunderstorms arrived the latter accompanied by heavy shower. For all those storms the clouds travelled strikingly low.

Today, on the 10<sup>th</sup> bricklike cumulus clouds come from E, wind direction SE. Again there is a tendency towards storm formation; however, the clouds are now higher.

At Laurenzi, the weather proverb says, the thunderstorms go home. There seems to be some truth in this, as they move indeed, and certainly the incidents around Brno are no isolated occurrences.

From the Imperial Central Institute for Meteorology and Earth magnetism  
Vienna, the 12<sup>th</sup> August 1857 (W. Z.)

#### NOTES

- 1 MENDEL 1866. For a critically commented edition see also MIELEWCZIK et al. 2022a.
- 2 The perception of Mendel as a researcher who only published very few articles can be found in numerous early articles on his life. Notably even in 1965 the Geneticist L.C. Dunn in his Symposium Lecture commemorating the centenary of Mendel's lectures and publication referred to this point, highlighting that only four publications of Mendel were known (DUNN 1965). In Mendel's hometown Brno it was though long known that there were particularly more articles that were published by Gregor
- 3 MENDEL 1853, 1854, 1863, 1864, 1865, 1866a, 1866b, 1867, 1870a, 1870b, 1871, 1879, 1882. See for comparison *Bibliographia Mendeliana* in JAKUBÍČEK & KUBÍČEK 1965.
- 4 See for example LIZNAR 1882, 1886, TOMASCHEK 1879, 1880. For a complete list of publications from the 19<sup>th</sup> century containing information on experimental data by Gregor MENDEL see MIELEWCZIK et al. 2022a. The updated publication list also contains an extensive overview of other short reports that are thought to have been published by Gregor Mendel during his lifetime. For comparison see also OREL 1971 and MIELEWCZIK 2017 for his later reports on bees.
- 5 See for example RICHTER 1943, p. 105. For comparison see also MUNZAR 1971 with an overview to Mendel's first unpublished meteorological report that he wrote as a student.
- 6 For comparison see the *Bibliographia Mendeliana* in ILTIS 1924; RICHTER 1943, p. 105–106; JAKUBÍČEK & KUBÍČEK 1965; JAKUBÍČEK 1970, 1976 and WEILING 1970; DUBEC & OREL 1980, S. S. 242; CZIHAK 1984, S. 62–63; OREL 1984 in the appendix [without page-numbers]; NUNEZ 2000) in which the article is not mentioned.
- 7 MENDEL G (1857) Ueber das Gewitter in Brünn am 7. August. *Brünner Zeitung*, 18. August 1857 (No. 186): 1. For an English translation see the Appendix. The abbreviation "W.Z." at the end of the article refers to the "Wiener Zeitung", which had published Mendel's report on the front page of its evening edition of the 14<sup>th</sup> August 1857 (No. 185). A slightly differing version of the article had also appeared a day earlier on the 13<sup>th</sup> August 1857 in the *Ost-Deutsche Post (Wien)*, No. 184. Furthermore, a significantly shortened version of the report had been published on the 12<sup>th</sup> November 1857 in "Die Presse", p. 6. Mendel's report eventually was also reprinted in the *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Classe* Vol. 27 (1858), Appendix, page IV. Even though it had first appeared in a daily newspaper it was clearly written as a scientific report.
- 8 See MENDEL 1871, 1879, 1881.
- 9 For a comparison to historical mentions of tornadoes occurring in the Czech lands see for example BRÁZDIL et al. 2004, p. 26.
- 10 Carl [Karl] Schwippel (1821–1911) was a teacher and geologist. He was born on the 4<sup>th</sup> June 1821 in Prague as son of an economic magistrate. In Prague he studied at the local Gymnasium, later at the philosophical faculty of the Prague university and then for two years at the Prague Polytechnikum. However, particularly

interested in natural sciences he eventually ended his technical studies and studied mineralogy, botany and Geology at the Prague University, where he obtained his doctoral degree in 1849. In 1851 Schwippel became a suppl. Professor at the Brno Gymnasium. A year later he held an identical teaching position in Vienna at the Theresian Academy. In Vienna he successfully completed his teaching exams for physics and natural history. In the following he worked as a teacher in Olomouc (Olmütz) until he returned in 1856 to Brno, where he worked for the overall 13 years as a teacher. During this time, he was highly active in the local agricultural society, for some time secretary of the natural history society and multiple times vice-president in the local Werner Society. He later became director at the Gymnasium in Znojmo (Znaim) in 1869 and Brno in 1871 and from 1872 onwards he worked as a school inspector. After retirement in 1882 Schwippel relocated to Vienna. He was the author of several papers and particularly interested in geological and paleontological topics. Biographical information is given according to CERNAJSEK & SEIDL 2001.

11 SCHWIPPEL 1857a.

12 Paul Olexik (1801–1878) was epidemiologist and meteorologist. He was born in the Slovakian Klin as the son of a farmer. From 1820 onwards he studied medicine in Vienna, where he obtained his doctoral degree in 1826. During the late 1820s he worked at the General Hospital in Vienna and accompanied an expedition to Russia to study local measures against the then raging cholera epidemic. In 1832 he gained a position as doctor in a local hospital in Brno. He there worked there for many years and already in 1844 he became a member of the meteorological section of the Moravian and Silesian Agricultural Society. For many years he was responsible for the daily meteorological measurements at his station in Brno, which were fully taken over by Gregor Mendel after the death of Paul Olexik. Biographical information is given according to VÁVRA 1977.

13 SCHWIPPEL 1857b.

14 MENDEL 1871, p. 242. The article there also mentions another previous thunderstorm on the 28<sup>th</sup> July 1861. However, for this date we were not able to identify another publication by MENDEL. Newspapers from Vienna from the summer of 1861, however, describe the occurrence of tornadoes in several places in Austria and Moravia. Interestingly the storm is also mentioned briefly in a phenological observation that was published in the *Brünner Zeitung* which was issued on the 3<sup>rd</sup> August 1861 and signed with the author abbreviation [J. G.]. The latter article is a typical example of phenological observations that were frequently published throughout the 1850s and 1860s in Brno. The author of the observations, in all likelihood, was Johann Gans who seems to have been the main author of this kind of reports with the column titled “*Aus dem Gesenke*”. It is quite interesting though, that two recently found newspaper articles from 1861, which discussed Mendel’s experiments in the context plant breeding and acclimatization experiments were published exactly around the time when the second mentioned storm occurred (see for comparison VAN DIJK et al. 2018 & MIELEWCZIK et al. 2022b).

15 See VOLLMANN & MATALOVÁ 2016a and 2016b. The thunderstorm was mentioned there in an article from the 12. August 1857 in *Die Presse* and referred to a direct report by Gregor Mendel given to *Centralanstalt für Meteorologie und Erdmagnetismus*. The note comprised however only a few lines and as far as we know was never discussed in detail.

16 See for comparison LACINOVÁ et al. 2007; BRÁZDIL et al. 2012.

17 Translation by the authors from the original.

18 *K.k. Centralinstitut für Meteorologie und Erdmagnetismus*.

19 Mendel here uses the term ‘*Wirbelorkan*’ while in his paper from 1871 he speaks of a ‘*Windhose*’. Older sources often used numerous other different terms for tornadoes in Moravia, Bohemia and Austria including also other terms such as “*Wasserhose*”, “*Wirbelsturm*” or “*Wirbelwind*” (see for comparison also LACINOVÁ et al. 2007).