

LETTER TO THE EDITOR:**DO WE REALLY HAVE TO REPHRASE TWO OF THE MOST SENSITIVE PERIODS IN THE EARLY HISTORY OF GENETICS?**

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In their current article in the *Folia Mendeliana*, already available as preprint online, Van Dijk & Ellis discuss their most recent discovery of a previously unknown journey of Mendel to Leipzig in September of 1865. In this context, they also raise the possibility that this was only an in-between stop of Mendel on his visit of a gardening and horticultural exhibition in Erfurt that was held around this time. Furthermore, they also assume that there was a possible link between this visit and the existence of the Bamberg reprint, an only recently discovered early abridged version of Mendel's article that has been published in 1867, thus predating all previously known other reprints and the rediscovery of Mendel's work by more than 30 years.¹ Additionally, Van Dijk & Ellis pull on a few loose strings and footnotes in our own paper on the discovery of the Bamberg reprint, particularly linking to the offprints of Mendel's paper that have been printed in 1866. While we are ourselves intrigued by the new finding of Van Dijk & Ellis, we think a direct reply letter is now mandatory, as their article will add unnecessary confusion to readers and future researchers studying two of the most sensitive phases in the early history of genetics – namely 1.) the short initial phase between the initial lectures held by Gregor Mendel in February and March 1865 and the eventual publication and circulation of his printed article on 'Experiments in Plant-Hybrids' in the winter of 1866/67 and 2.) the brief period of the rediscovery. In particular four points, in our opinion, require a more thorough discussion and reassessment: I) the possible correspondents that exchanged information between Brno/Brünn and Bamberg relating to Gregor Mendel's paper; II) open questions on the special offprints of Mendel's paper that were printed at the end of 1866 in Brno/Brünn; III) the potential participation of Mendel on the travelling bee-keeping convention that was held in Brno/Brünn in September 1865; and IV) the possible objective of Mendel's journey to Saxony in September 1865. Our letter reports itself:

I. On the correspondence between Bamberg and Brno/Brünn in the timeframe of 1865 to 1867 and the identity of the potential editor of the Bamberg reprint

Van Dijk & Ellis conclude that the Bamberg reprint was based on one of the 40 special reprints that had been produced in Brno/Brünn, as it, as they claim, contains

several corrections that can be also found in the manual annotated corrections that were added by Gregor Mendel personally to at least some of those 40 reprints. However, as we will explain in more detail, this is a mistake that is based on mismatching different versions of Mendel's text by the authors. First of all, the smoking gun, presented by the van Dijk & Ellis 2023, is the following sentence from the Bamberg reprint: "*Je zwei differierende hiegegen vereinigen sich an der Hybride zu einem neuen Merkmale*". This sentence was then linked to the English translation: "*Two each of the differing traits itemized above were united by fertilisation*", which had been translated by of Müller-Wille et al. 2020. The latter English sentence is indeed linked to a manual correction which change the word "In [...]" to "Je[...]". However, this is a mismatch in the selected sentence of the original text, as the Bamberg sentences closely matches another sentence in Mendel's original text, which did not need a correction (see the correct matching in Tab. 1). In the Bamberg reprint the relevant sentence is not even included. Checking for the further corrections reveals, that there are indeed only two very minor corrections from the known offprints that one can find in the Bamberg reprint (see table 2). Both corrections, however, can also have been performed by the typesetter or editor without any knowledge of a special reprint manual corrections by Mendel. Van Dijk & Ellis though now assume that one of the manually corrected offprints was used as the source for the Bamberg reprint or "*negotiated with Mendel before the reprints became available*". However, as can be seen from the two tables below, while this is possible, it is not highly likely. Van Dijk & Ellis in their article also add two additional facts to support their hypothesis. First, that the article appeared quite early after the original publication of Mendel's article and the special offprints produced in Brno/Brünn, thus that it seemed likely to them, "*that Mendel sent a reprint to someone in Bamberg in January 1867*". Second, they also reference a footnote in our own article on the discovery of the Bamberg reprint (Mielewczik et al. 2017), from which they conclude, that we also had assumed that it might have been based on a reprint. We believe both assumptions require a clarification from our side now. First Van Dijk and Ellis are correct that we also considered this possibility. There were two particularly reasons for this. First, we also noticed the very early appearance in February 1867 only a few weeks after it is known that Gregor Mendel send offprints to Carl Wilhelm von Nägeli (1817-1891) and Anton Kerner (1831-1898). However, it should be noticed that at that time the full edition of the *Verhandlungen des naturforschenden Vereins in Brünn (VNV)* have been available in Bamberg at that time already as well. Van Dijk & Ellis highlight, that in some cases journal was only received in March 1867 for example by Royal Netherlands Academy of Arts and Sciences in Amsterdam and the German Geological Society in Berlin.² However, according to our own reconstruction of the publication process, the IV. Volume of the *VNV* was send out by Gustav von Niessl (1839-1919) in the last weeks of November 1866. While it is reasonable to assume that some foreign institutions only received the volume a couple of weeks later, in most instances it remains a reasonable possibility that the volumes were only added as received in later sessions of the individual natural history societies. In the special case of Bamberg, we believe, it is rather unlikely that the postage routine of the *VNV* took several months for a shopping to Bavaria. For example, from the letters exchanged between Gregor Mendel and C.W. von Nägeli in Munich it can be learned that shipping of living plants was possible by train and took a couple of days at maximum (see Correns 1906). Second, while Van Dijk & Ellis are correct that we very carefully raised in a footnote the possibility that the Bamberg reprint was based on a corrected offprint, we tried to be very careful in our final phrasing in the original article³, particularly, as there are additional unresolved major questions in regard to the 40 offprints. Therefore, it cannot be safely concluded in our opinion that Gregor Mendel himself send an offprint to Bamberg. Even

if the text would have overlapping manual corrections, the description of the provenances of all known offprints is not certain enough to conclude, that those corrections were not also sent out by the secretary of the society G. v. Niessl. Furthermore, a reasonably alternative seems to us, that the secretary of the Brno/Brünn local trading society (*Brünner Gewerbe-Verein*⁴), Robert Heym (1816–1866) was in exchange with the corresponding Bamberg Society.

II. On the fate of the 40 offprints and the problem of provenance

There exist only very few snippets of information on the fate of the 40 offprints of Mendel's article that have been printed in Brno/Brünn in 1866. By 1984, only 14 different issues had been discovered, whereby only 7 are known to contain manual corrections (see Table 2)⁵. Of those issues with hand written corrections two are currently available online. The Vienna reprint and a copy stamped TB, which is available at the Max Planck Institute in Berlin (MPI) and which was used for the text analysis by Van Dijk & Ellis 2023 (and also by us during the preparation of our article in 2017). Neither the webpage nor Van Dijk & Ellis 2023 provide any information on the provenance of the used text. However, as can be seen from our analysis (Tab. 2), the digital MPI edition does not match any of the editions that have been described by F. Weiling (Weiling 1984). With certainty it cannot be the Tübingen offprint nor can it be the one from Graz. If at all it shows similarities with the B I and B II editions Weiling has described, but even in this the similarities are not complete. When we first noticed these discrepancies, it was for us reason to not go into a word by word comparison in our annotated transcript of the Bamberg reprint, as we did not had a reasonable explanation for this oddity and were also unsure, if the handwriting was actually that of Mendel. In fact, we were later independently supported in our analysis, when another offprint of Mendel's 'Experiments in Plant-Hybrids' was offered by the auction house Christies, also containing the purple TB stamp mark, linking it to lot No. 11 on Weiling's list.⁶ To add to the confusion of those offprints the readers might assume that the stamp TB might refer to the provenance of the Mendel offprint owned by Theodor Boveri (1862–1915) (the Tübingen reprint), however, the abbreviation TB was actually the stamp of the collector who in the eighties found several offprints of Mendel's paper.⁷ Van Dijk & Ellis pull on a loose string in our footnote on the Tübingen reprint. However, the main point of this footnote was for us to inform the reader on potential unresolved issues on the Provenance of the Graz and Tübingen reprints. Information on their provenance is severely limited, and for the Tübingen reprint in particular it is only known that it was found in the scientific inheritance of Th. Boveri. Our comment in the footnote was rather meant less pretentious but reflected the irritating prospect that one of the most rare scientific documents of the 19th century has actually landed twice in the very close surrounding of the family of one of the fathers of the chromosome theory of inheritance. The comment, however, was rather meant less spectacular but only linking to the possibility that this offprint did not originate from the provenance of the estate of C. W. v. Nägeli that then came into the hands of Th. Boveri, but could have also been obtained by Boveri directly in his hometown Bamberg.⁸

III. The potential participation of Mendel on the travelling bee-keeping convention that was held in Brno in September 1865

As noticed by Van Dijk & Ellis the journey to Leipzig in September 1865 might potentially interfere with the previous assumption that Mendel participated in the Travelling Convention of German Beekeepers that was held at that very month in Brno/Brünn. It has been assumed previously that Mendel either directly participated in

this conference or at least had a chance to talk to some participants of the lecture which were then housed at the monastery in Brno/Brünn. Why Mendel should have become aware of Johannes Dzierzon's (1811–1906) work through the books of his then late friend Johann Nave (1829–1864) is however not clear to us from the article of Van Dijk & Ellis 2023. As a matter of fact, even if Mendel was himself not attending the meeting, which we believe is still in question, he possibly would have heard about it from other attendants, particularly because the then prelate of the monastery Cyrill F. Napp (1792–1867) was the chair and organizer of the meeting. In particular J. Dzierzon was attending the meeting in Brno/Brünn personally and each of his remarks was loudly celebrated during the meeting. Even before the meeting it would be possible for Mendel to have heard about Dzierzon's work that had been cause of some discussions. As a matter of fact, Mendel's own personal library contained practically all books on beekeeping that were presented at the conference. Therefore, he would not need to have been particularly relying on any books by Nave in this regard.

IV. The possible objective of Mendel's journey to Saxony in September 1867

Van Dijk & Ellis conclude that the journey of Mendel to Saxony in 1865 has been previously unknown and that he must have had a "significant reason for his journey to Leipzig". Accordingly, they highlight that the Horticultural Congress and Exhibition in Erfurt, which had been visited by 30,000 people, might have been this reason. We believe this is well possible. However, we also believe that there must be some doubt now, if this journey of Mendel to Saxony was indeed previously unknown. As we highlight in a parallel article in the current issue, there might have simply been a misdating of a previously known visit to Saxony. The visit was first mentioned by the plant physiologist Hans Molisch (1856–1937), who in the reminiscences of his life remembered that Mendel once had visited his brother Ferdinand in Dresden. The date of the travel was later linked by Oswald Richter (1878–1955) to the year 1871, however, as we discuss in our parallel article, this cannot be correct. The mention however might support the main conclusion of Van Dijk & Ellis 2023 that Mendel might have visited the Horticultural Congress and Exhibition in Erfurt. Nevertheless, we also think it might be important to highlight to also consider other reasons for Mendel's visit to Leipzig. As careful readers of our original article might have noticed, we already were wondering if Mendel at that time had possible connection to Leipzig, which we then could not prove. The underlying reason for our suspicion were two very simple questions that we had asked ourselves. 1.) What could Mendel have done to further improve his mathematical understanding of generational change inside a population and 2.) What could he have done to further promote the circulation of the rules found by him? Interestingly enough, both questions then led us to speculate on a potential link to Leipzig. In the first case the origin for our internal speculation was the fact, that we believed from the original newspaper articles published on Mendel's lecture in 1865 that R. Heym, the then secretary of the Local Trading Society (*Gewerbeverein*) in Brno/Brünn was one of the attendees of the meeting. Yet, as far as we could establish it so far, R. Heym came from Leipzig to Brno/Brünn after the revolution of 1848–49 and was a brother of the mathematician Karl Heym, who at that time was a pioneer in the creation of mortality tables for insurance companies. The latter one was actually an idea that was also promoted and established in the 1860s in Brno/Brünn. The generational calculation approaches on health data by K. Heym might have well drawn the attention Mendel to visit him at that time in Leipzig. Regarding the second point, our assumption was that Mendel's friend a monastic friar František T. Bratránek (1815–1884) at that time already had established connections with publishers in Leipzig and Karl Gutzkow (1811–1878) in

particular. As it is well known that Bratránek published several encyclopaedic articles for the latter, we assumed that this might also have been a potential reason for Mendel to visit Leipzig.

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NOTES

- 1 See Mielewczik et al. 2017 with the original presentation of the Bamberg reprint.
- 2 Similar results on the receipt by several Natural History Societies were also presented by us in Mielewczik et al. 2017. See there for example footnote 31 for the receipt in Bremen.
- 3 See Mielewczik et al. 2017.
- 4 Van Dijk & Ellis 2023 translate *Gewerbeverein* as Chamber of Commerce. This is, however, misleading and incorrect because the Chamber of Commerce (*Handelskammer*) was a separate official institution in Brno/Brünn, whereas the *Gewerbeverein* rather had the character of a society, even so there was some overlap in the invested persons involved in both.
- 5 A seventh version was found in Japan with a set of very different corrections, thus not considered here. See for comparison Weiling 1984.
- 6 Offprint with wormholes and further markings was eventually sold for 287,250 GBP in July 2019. See <<https://www.christies.com/en/lot/lot-6216731>>.
- 7 See for comparison Weiling 1984.
- 8 There is not true continuous provenance recorded for any of the offprints outside Brno/Brünn. In the case of the most prominent offprints from Vienna, Tübingen and Graz the information available seems to have been first collected for the centenary celebration of Mendel’s lectures in 1965 (see Kríženecký 1965, pp. 19–22) and then appended during the centenary celebration of Mendel’s death in 1984 (Weiling 1984). According to those reports the Tübingen offprint was found in the scientific estate of Th. Boveri. In the follow-up there seems to have been speculation, if Boveri had obtained the offprint during his time at the University in Vienna from C. W. v. Nägeli. However, this complete association seems to have been only based on speculation. Similarly, there must be at least some doubt on the provenance of the Graz reprint, which has sometimes been attributed to have been sent by Mendel to Franz Unger (1800–1870).

APPENDIX

Table 1: Comparison of selected sentences in the Bamberg reprint (1867), Mendel's original article as it appeared in the *VNV* (1866), the Brunn reprint (1866) with manual corrections and the latest English translation by Müller-Wille et al. 2020. Differences between the corresponding sentences are underlined by us.

Bamberg reprint	Mendel 1866 in <i>VNV</i> 4: 3-43. (see page 7 & 9.)	Mendel 1866 special reprint with corrections (see page 7 & 9)	English Translation by Müller-Wille et al. 2020
<p>[...] je zwei differirende <u>hiegegen</u> vereinigen sich an der Hybride zu einem neuen Merkmale, welches gewöhnlich an den Nachkommen der selben <u>Veränderung</u> unterworfen ist.</p>	<p>[...]; je zwei differirende <u>hingegen</u> vereinigen sich an der Hybride zu einem neuen Merkmale, welches gewöhnlich an den Nachkommen der selben <u>Veränderungen</u> unterworfen ist.</p>	<p>[...]; je zwei differirende <u>hingegen</u> vereinigen sich an der Hybride zu einem neuen Merkmale, welches gewöhnlich an den Nachkommen der selben <u>Veränderungen</u> unterworfen ist.</p>	<p>[...]; two differing traits, in contrast, unite on the hybrid to form a new trait that usually is subject to changes in their descendants.</p>
	<p><u>In zwei</u> von den angeführten differirenden Merkmalen wurden durch Befruchtung vereinigt.</p>	<p><u>Je zwei</u> von den angeführten differirenden Merkmalen wurden durch Befruchtung vereinigt.</p>	<p><u>Two each</u> of the differing traits itemized above were united through fertilisation.</p>

Table 2: Comparison of different corrected reprints of Mendel's article from 1866 dealing with different printing errors (X = corrected; see details in the main text. Table modified from Weiling (WEILING 1984, p. 261). The numbers of the known reprint specimens are given according to the same paper (WEILING 1984, pp. 257–259). The Vienna reprint (1) and the Tübingen reprint (2) are given as analyzed by Weiling (WEILING 1984) but were cross verified by us against the available online versions (*). The Bamberg reprint (13) was shortened and follows a different numbering scheme and was analyzed by comparing the corresponding sentences (**). Sentences with corrections in the other offprints that were not included in the Bamberg reprint due to shortening of the text were greyed out by us. The analysis all other reprints shown is given as originally provided by Weiling (WEILING 1984). For the different corrections: page 3 (line 3): “her” was corrected to “hier”; page 6 (line 36): “geschrieben” was corrected to “beschrieben”; page 9 (line 3): “In “ was corrected to “Je”; page 12 (line 25): “völlige” was corrected to “völlig gleiche”; page 15: unknown; page 21 (last line): “jede” was corrected to “jedes”; page 22 (line 12) “Entwicklungsreihe” was corrected to “Entwicklungsreihen”; page 31 corrected a serious error in the last equation substituting on of the “+” signs with a “=”; page 33 (line 7): “windenden” was corrected to “windendem”; page 34 (line 1): “darstellen” was corrected to “darstellten”; page 40 (line 16): “demselben” was corrected to “denselben”; page 46 (eights line from the bottom): “Es” was corrected to “Er”.

Page of error / No. reprint specimens	3	6	9	12	15	21	22	31	33	34	40	46
1. Vienna*	X	X	X	X		X	X	X	X	X	X	X
2. Tüb.*	X	X	X	X		X	X	X	X	X	X	X
3. Graz	X	X	X	X		X	X	X	X	X	X	X
7. Lilly	X	X	X	X		X	X	X		X	X	X
11. B I	X	X	X	X	X		X	X	X	X	X	
12. B II	X	X	X	X		X	X	X		X	X	X
D1. Vienna	X	X	X	X		X	X	X	X	X	X	X
D2. MPI ^a	X	X	X	X			X	X	X ^b	X	X	
13. Bamberg**	X ^c											X ^d

- a The digital edition of the MPI reprint, in contrast to the table in Weiling 1984, does not contain the correction on page 21 and 46 that are included in the Vienna reprint.
- b The scan quality in the digital specimen (2) was too low to make any assumptions whether the “m” was printed or a manually corrected “n”.
- c See the cover page of the first article of the Bamberg print (line 8).
- d See the second article of the Bamberg reprint (eleventh line from the bottom), p. 12.