

Graphical Grammar

A historical survey until 1955

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0.0.1 Simon Heinrich Adolf Herling: *Periodenbau* (1823)

[0.1] Simon Heinrich Adolf Herling (1780-1849) was a teacher in Frankfurt am Main and founding member, and later main organizer, of the *Frankfurter Gelehrtenverein für deutsche Sprache*. His analysis of multi-clause sentences is widely considered foundational for the grammatical analysis of German. A wide-ranging appraisal of Herling's work can be found in Elmentaler (1996).

[0.2] Herling is a close friend and colleague to Ferdinand Becker (see Section 0.0.2), who is also an active member of the *Frankfurter Gelehrtenverein*. A plan to write a joint grammar fell apart, indicating different opinions in their approach to grammatical analysis (Haselbach 1966: 69). Their relation remains amicable, as indicated by the fact that the first part of Herling's *Syntax der deutschen Sprache* (Herling 1830) is dedicated to Becker.

[0.3] Strictly speaking, the work of Herling does not include any graphical display of grammatical analysis. However, his work is still included here because he introduces some notation that will be expanded upon graphically by later authors, especially Lehmann and Götzinger. Herling's notational framework is first introduced in the *Grundregeln des deutschen Stils oder der Periodenbau der deutschen Sprache. Ein Lehrbuch für den stilistischen Unterricht* (Herling 1823), which later becomes the second part of *Die Syntax der deutschen Sprache* (second edition 1827, third edition 1832).

[0.4] In this book Herling analyses the different ways complex sentences are build from multiple clauses. He uses the term *Periode* for the complex sentence, a term that goes straight back to antiquity. Aristotle uses the term *περίοδος* 'periodos' to describe something akin to a complete sentence, consisting of multiple clauses (with *κῶλον* 'kolon' being used for something akin to a clause). Burkett explains that "the term *periodos* is one of Aristotle's visual metaphors, suggesting a circular motion or completeness of thought and rhythm." (Burkett 2011: 206).

λέγω δὲ περίοδον λέξιν ἔχουσαν ὀρχήν καὶ τελευτήν αὐτήν καθ' αὐτήν καὶ μέγεθος εὑσύνοπτον ("I call a period an expression having a beginning and an end in itself and a magnitude easily taken in at a glance," Aristoteles, Rhetorica III 9.3, translation by Burkett 2011: 206)¹

[0.5] The term *Periode* as a grammatical term for the complex sentence is widespread in German 18th and 19th Century grammatical texts, for example Meiner (1781: 446) or Heyse (1814: 491).

[0.6] In a short note, Herling proposes a special notation "um die Umformungen kürzer zu bezeichnen, und so leichter überschauen zu können" ('to succinctly mark the transformations and thus be able to survey them more easily' Herling 1823: 177). The usage of the term *Umformung* deserves its own discussion, but will not be pursued here. The special notation is summarized slightly clearer in the second and third edition (e.g. Herling 1832: 232), shown here in Figure 1, which can be translated as follows:

For the succinct marking of the sentences and their syntactic relationships may the following symbols be of use: *h* indicates grammatical main sentence; *b* adjective clause, *β*, when it is shortened; *a* adverbial clause, *α*, the same shortened; *s* nominal clause, *σ* the same shortened. The exponents, e.g. *a²* indicate the grammatical grade, to *h* e.g. *h²* the grade of the logical gradation; *h/2*, *h/3*, indicates that the main clause, or *a/2*, *a/3* that the adverbial clause is separated

¹Original online at the Perseus Digital Library <<http://data.perseus.org/citations/urn:cts:greekLit:tlg0086.tlg038.perseus-grc1:3.9.3>>.

into two or three parts. The coefficients e.g. $2h$ indicate the number of equivalent main clauses; with a, b, s their relationship to the main clauses, often their coordination. (Herling 1832: 232, translation MC)

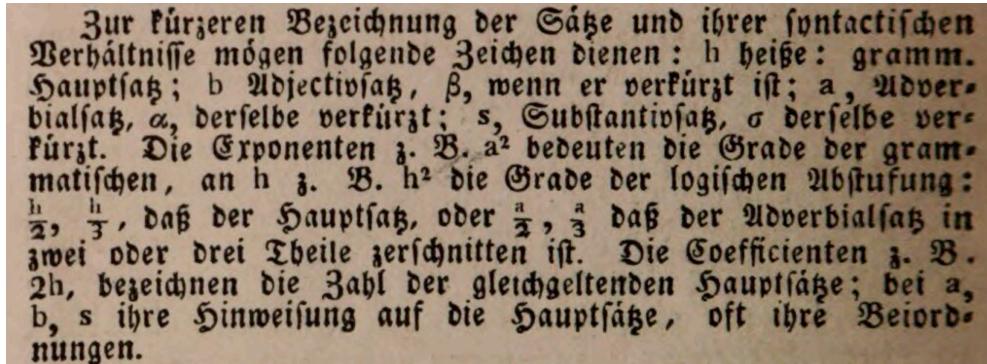


Figure 1: Notation for the analysis of sentence structure proposed by Herling (1832).

Herling does not use his notations consistently throughout his book. There are only a few [0.7] incidental examples and there are almost no sentences completely marked according to this system. The example in (0.1) is one of the more interesting and complex cases (Herling 1832: 233). Yet, in contrast to intended purpose, the abstract analysis with letters and numbers does not really ease the quick appraisal of the sentence structure, in my opinion.

- (0.1) Um (α) dem Soldatenstande zu entgehen, gegen den (b^2) er, ungeachtet (α^3) seinen unternehmenden Geistes und kräftigen Körpers, entschiedene Abneigung fühlte, verdingte er sich, (1h) im sechzehnten Jahre, bei einem Gastwirthe an der Gränze als Fuhrknecht, und (2h) kehrte erst nach sieben Jahren, da (2a) eben in seinem Geburtsorte ein nicht ganz unbedeutendes Grundstück feil geboten ward, in die Heimath zurück. (Herling 1832: 233)

Interpreting Herling's analysis in modern terms, his symbols can be seen as a constituency [0.8] structure. All clauses in the complex sentence are given a label and are related to each other in a hierarchical fashion, distinguishing coordination (viz. number in front) from subordination (viz. special letters for different kinds of embedding and superscript numbers to indicate deeper levels of embedding). Crucially, the clauses are linked to each other without using specific words as anchor points, like they would be in a dependency structure (cf. Becker's sentence analysis of a complex sentence, see Section 0.0.2). Figure 2 shows an interpretation of Herling's analysis from (0.1) in the form of a constituency tree.

0.0.2 Karl Ferdinand Becker: *Deutsche Grammatik* (1829)

Karl Ferdinand Becker (1775-1849) one of the highly influential grammatical educators from [0.9] the start of the 19th Century.

(Haselbach 1966)

In the introduction to the 1829 *Deutsche Grammatik* (Becker 1829: xvii-xix), even before [0.10] he really starts the exposition of the grammar of German, Becker presents a few examples [0.11]

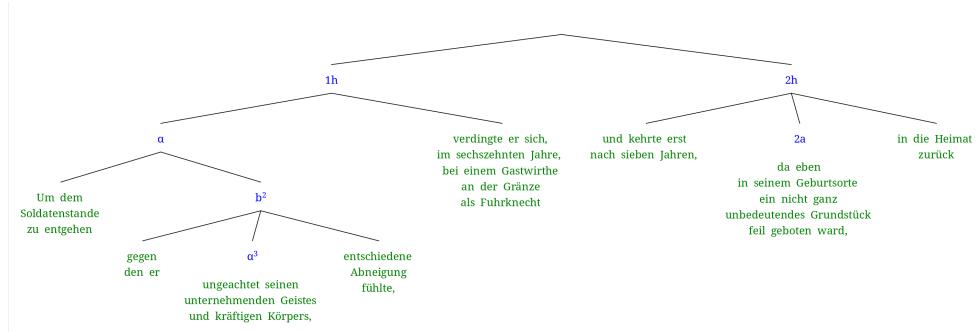


Figure 2: Constituency tree illustrating Herling's analysis (Herling 1832: 233) of the example in (0.1) using a modern visualization. Crucially, the clauses are linked to each other without attaching them to any specific words as would be the case in a dependency structure.

of how complete sentences should be analyzed.

- (0.2) Wallenstein wußte längst den Inhalt ihrer Sendung als die Abgesandten des Kaisers ihm vor die Augen traten.

	W o r t f o r m .	G r a m m a t i s c h e B e d e u t u n g .
1 Wallenstein	Substant. N.	Subjekt des Hauptauses.
2 wußte	Verb. Imperf.	Prädikat zu 1.
3 längst	Adverb	der Zeit zu 2.
4 den Inhalt	Substant. Akk.	Gethanes (Gewußtes) zu 2.
5 ihrerSendung,	Substant. G.	Attributiv zu 4.
6 als	Konjunktion	des Adverbialsages im Verhältnisse der Zeit zu 2.
7 dieAbgesandten	Substant. N.	Subjekt des Adverbialsages.
8 des Kaisers	Substant. G.	Attributiv zu 7.
9 ihm	Personalpron. D.	Persönliches Objekt zu 10, 11.
10 vor die Augen	Subst. mit Präp.	Ortsverhältnis zu 11.
11 traten.	Verb. Imperf.	Prädikat zu 7.

Figure 3: Tabular analysis of the complete sentence (0.2), from the introduction of Becker (1829: xvii).

[0.12] CoNLL-U table-format of Figure 3 with only slight cosmetic simplifications of the names for the dependency relations.

#	global.columns = ID FORM UPOS DEPREL HEAD			
1	Wallenstein Substantiv Nom.	Subjekt	0	
2	wußte Verb Imperf.	Prädikat	1	
3	längst Adverb	der Zeit	2	
4	den Inhalt Substantiv Akk.	Gethanes (Gewußtes)	2	

5	ihrer Sendung	Substantiv Gen.	Attributiv	4
6	als	Konjunktion	Adverbialsatz der Zeit	2
7	die Abgesandten	Substantiv Nom.	Subjekt	6
8	des Kaisers	Substantiv Gen.	Attributiv	7
9	ihm	Personalpronomen Dat.	Persönliches Objekt	11
10	vor die Augen	Substantiv mit Präp.	Ortsverhältniß	11
11	traten	Verb Imperf.	Prädikat	7

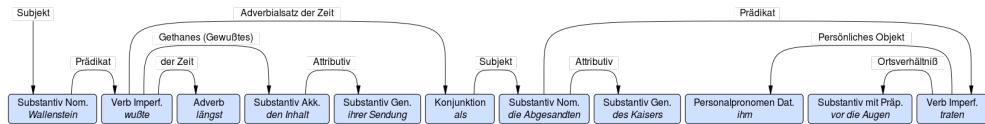


Figure 4: Graphical display of the CoNLL-U format based on Figure 3. Display is generated at <https://urd2.let.rug.nl/~kleiweg/conllu/>

subordinate sentences in (Becker 1833: 38-46) (*Eigenschaftssatz*=relative clause, [0.13]
Dingsatz=complement clause)

- (0.3) Jakob schickte seinen jüngsten Sohn nicht mit den übrigen nach Aegypten, weil schon einmal ein Sohn, den er ausgesandt hatte, nicht zurückgekehrt war, und weil er fürchtete, daß auch diesem ein Unfall begegnen möchte.

0.0.3 Gustav Billroth *Lateinische Syntax* (1832)

At the end of his short life, Johann Gustav Willhelm Billroth (1808-1836) became professor [0.14] for religion at the university in Halle. However, between his *Habilitation* in Leipzig in 1830 and the start of his position in Halle in 1834, he worked as a teacher for latin (Alwast 2000). In that context he wrote two latin grammars for use in schools, first the *Lateinische Syntax für die obern Klassen gelehrter Schulen* (Billroth 1832), later followed by the *Lateinische Schulgrammatik für alle Klassen* (Billroth 1834).

In these grammars there is a single graphical display of a grammatical structure, shown [0.15] below in Figure 6 (Billroth 1832: 102). There is not much known about the grammatical background of Billroth, nor is there any indication in his books about the inspiration for drawing a grammatical analysis. There are some indications that Billroth was influenced by Heyse's grammar of German (see below), specifically the fourth edition (Heyse 1827). However, the idea of drawing a sentence structure is nowhere to be found in Heyse's work, so this approach seems to be a genuinely new idea of Billroth.

The influence of Heyse on Billroth can be inferred by the usage of the peculiar tripartite basic sentence structure of subject, predicate and copula. Even more clearly, Heyse's influence is indicated by the metaphor of the *nackte* 'naked' and *bekleidete* 'dressed' sentence. The origin of this terminological distinction can be traced back to Meiner (1781: 446), who uses the terms *bloß* 'bare' for a minimal sentence and *ausgebildet* 'developed' for a sentence with additional modifiers. Contemporaneously, Adelung (1782: 572) uses the terms *einfach/nackt* 'simple/naked' and *ausgebildet* 'developed'. This terminology is slightly changed in the first edition of Heyse's grammar of German (Heyse 1814: 492-492) into *einfach/rein* 'simple/pure' and *ausgebildet/erweitert* 'developed/extended'. Then Heyse adjusted this again in the second edition by adding the term *nackt* 'naked, bare' as an alternative to *einfach* and *rein* (Heyse 1820: 598). Finally, in the fourth edition of 1827 he adds the term *bekleidet* 'dressed':

Solche Sätze [...] kann man AUSGEBILDETE, erweiterte, oder (im Gegensatze zu den nackten) BEKLEIDETE Sätze nennen. ('Such sentences can be called "developed", "extended" or (opposite to "naked") "dressed" sentences.') (Heyse 1827: 636)

- [0.17] In Billroth's syntax, the whole discussion of the structure of the sentence takes 11 pages (Billroth 1832: 91-102). The structure is really difficult to follow from the text itself, although on closer inspection there is a clear drawn-out structure. First he introduces the simple 'naked' sentence:

Ein Satz ist entweder: A. ein einfacher (oder nackter) d.h. ein solcher, welcher bloß aus Subject, Prädicat und Copula besteht. ('A sentence is either: A. a simple (or naked) one i.e. one such that it only consists of subject, predicate and copula,' Billroth 1832: 91)

- [0.18] It takes 8 pages of explanations of the simple sentence until finally the expected follow-up to the option A occurs. Innocuously on page 97 the option B is announced, using a rather strange sentence structure that only makes sense when it is read immediately after the option A as quoted above.

B. oder ein bestimmter (bekleideter) d.h. ein solcher, wo entweder ein einzelner Theil oder mehrere durch Zusätze näher bestimmt werden ('B. or a determined (dressed) one, i.e. one such, in which either a single part or multiple parts are further determined by additions,' Billroth 1832: 97)

- [0.19] Then it takes another 5 pages of explanations of different kinds of such 'dressing' of a sentence until finally this topic is closed with the conclusion quoted below. Billroth simply states (without explanation) that the example (0.4) is 'dressed' as shown in Figure 6. In this quote, Billroth takes the metaphor of the naked/dressed sentence even one step further by using the term *Körper* 'body' for the naked sentence.

Auf diese Weise wird z.B. folgender Satz (0.4), dessen Körper eigentlich nur aus dem Subj.: Miltiades und dem Prädicat (mit dem Copula) reddidit besteht, bekleidet: ('In this way, the following sentence, whose body only consists of the subject *Miltiades* and the predicate (with copula) *reddidit*, is dressed,' Billroth 1832: 102)

- (0.4) Miltiades, dux Atheniensium, toti Graeciae libertatem paene oppressam in pugna apud Marathonem reddidit.

- [0.20] Interpreting his graphical explanation in more detail, the naked sentence is depicted by a horizontal line, while the additional elements of the dressed sentence are all shown as vertical lines. Billroth very clearly intends the vertical lines to represent some kind of dependency, with multiple levels of modification being illustrated by subsequent vertical lines.

- [0.21] Exactly the same approach with the same picture is found in his extended grammar written two years later (Billroth 1834: 332-333). After Billroth's early death this grammar has seen various new editions. The second edition of 1838 is prepared by Friedrich Ellendt and uses exactly the same figure (Billroth 1838: 329). However, in the third edition, the picture is changed, erroneously, and has become completely incomprehensible, cf. Figure 7 (Billroth 1848: 358). Ellendt possibly did not completely understand what the figure is supposed to represent.

- [0.22] Billroth's grammar has an interesting afterlife, but unfortunately without any further development of his graphical innovation. Friedrich Ellendt writes a different grammar for

younger students based on Billroth's model, called *Lateinische Grammatik für die unteren Klassen der Gymnasien*. The discussion of *bekleidete oder erweiterte Sätze* is very similar to Billroth's, but it has different examples and it does not have a picture anymore (Ellendt 1838: 115-116). After the death of Ellendt, that grammar is in turn adapted by Moritz Seyffert as *Dr. Friedrich Ellendt's Lateinische Grammatik für die unteren und mittleren Klassen der höheren Unterrichtsanstalten*. This grammar has seen very many revisions, editions and reprints under the heading *Ellendt-Seyfferts lateinische Grammatik* far into the 20th Century. However, Seyffert was not very impressed by the syntactical analysis of Billroth (as noted in the preface of his revision), and he revised the discussion of syntax wholesale.

On a more positive note, Billroth's graphical display had a direct influence on Julius Hoffmann (see Section 0.0.6), but also that incarnation of graphical grammar did not catch on. [0.23]

0.0.4 Johann August Lehmann: *Allgemeiner Mechanismus* (1833)

Johann August Lehmann (1802-1883) worked as a teacher in Danzig (Gdańsk) and later as a school principal in Marienwerder (Kwidzyn). In this context, he prepared various educational texts, mainly consisting of literary commentaries, but also including songbooks, dialect analyses and some works on local history. Early in his career he wrote a linguistic treatise about the structure of complex sentences: *Allgemeiner Mechanismus des Periodenbaues, nebst einem Versuche, an ihn eine Kritik der deutschen Periode anzuknüpfen* (Lehmann 1833). His approach to the analysis of complex sentences is based on the work of Herling (Section 0.0.1), who is explicitly cited as inspiration (Lehmann 1833: xv-xvi). [0.24]

In the title of his book, Lehmann uses the term *Periode*, which is a term also used by Herling. This term stems from the domain of rhetoric and roughly indicates a coherent and well-structured utterance. Continuing the tradition of Herling, Lehmann uses the term *Periode* to designate a complex sentence that consists of multiple clauses. Herling introduced symbolic abbreviations for different kinds of clauses, but Lehmann takes it a step further and proposes a comprehensive visualization, which he calls a *Periodenbild*. [0.25]

[Die] innere Anschauung der Periode soll als auf äußere Anschauung begründet dargestellt werden. Die äußere Anschauung aber findet ihr Objekt in Bildern, welche das Skelet der Perioden wiedergeben. Ich nenne dies Periodenskelet ANSCHAUUNGSBILD DER PERIODE oder PERIODENBILD schlechtweg. ('The internal structure of the *Periode* will be depicted based on the outward appearance. The outward appearance shows itself as a picture, which reflects the skeleton of the *Periode*. I simply call this *Periode*-skeleton an IMAGE OF THE PERIODE or PERIODE-PICTURE.) (Lehmann 1833: xiv)

For the visualization of a *Periodenbild* Lehmann distinguishes three different kinds of subordination, indicated by different symbolic devices as shown in Figure 8 (Lehmann 1833: 58). These three notations basically indicate a subordinate position (1) after, (2) before and (3) internal to the superordinate clause, respectively. More precisely, [0.26]

- the first notation uses a horizontal brace, which indicates that the subordinate clause (below the brace) follows the superordinate clause (above the brace). This is called *Anfügung* or *Nachperiode*;
- the second notation uses a colon, which indicates that the subordinate clause (in front of the colon) is positioned before the main clause. This is called *Vordersatz*, *Vorderperiode* or *Vorausschickung*;

- the third notation uses round brackets, which indicates that the subordinate clause (inside the brackets) is positioned inside the superordinate clause. This is called an *Einschaltung*. The separated parts of the superordinate clause are indicated by repeating the same letter. Such repetitions of the same letter thus do not indicate multiple clauses, but separate parts of the same clause.

[0.27] At first glance it seems curious that there are completely different notation for the placement in front (colon) and the placement behind (horizontal brace). However, there is clear rationale for this difference arising from the structural possibilities of the German language (although this rationale is not explained by Lehmann in his book). The German main clause has a special initial position (today mostly called *Vorfeld*) that can contain a single subordinate clause. So each main clause can only have a single *Vordersatz*, which Lehmann indicates with the colon. Internal and final subordination can be recursively repeated (which is illustrated with numerous examples throughout his book).

[0.28] Lehmann's book completely focusses on the analysis of complex sentences into their constituting clauses, using his graphical display to summarize the relationships between the clauses. There are hundreds of examples of different kinds of complex sentence structures discussed, but there is no clause-internal structural analysis at all. He appears to be much more interested in the number of possible schemas that could exist, which are all *Umformungen* of a sentence. For example, he discusses an example of a particular schematic analysis (apparently without any real linguistic example) that could theoretically have 37,632 *Umformungen* (Lehmann 1833: 116-118). Lehmann immediately notes “*Es wäre thöricht, bei dieser oder ähnlichen Perioden, die zu den Verwickeltsten gehören, all möglichen Veränderungen darzustellen.*” (‘It would be foolish for such or similar *Perioden*, that belong to the most complex, to illustrate all possible changes.’ Lehmann 1833: 116-118).

[0.29] Clauses are indicated by using letters, an approach that was also used by Herling (cf. Section 0.0.1). However, Lehmann has a completely different approach to the use of the letters. Lehmann is only interested in the relative ordering of the subordinated clauses and he completely ignores what kind of subordination is used. In contrast, Herling uses different letters for different grammatical kinds of subordinated clauses, for example *a* for adverbial clauses. When there are three adverbial clauses in a sentence, then they are all called *a* by Herling. The letters are thus indications of the grammatical kind of the clause. Lehmann instead uses a different letter for each subordinate clause, giving each clause a label, but omitting any indication of the internal structure.

[0.30] This difference between Herling and Lehmann also concerns the use of Greek letters. Herling uses greek letters for non-finite subordinate clauses (using *zu*-infinitive or participial verb forms in German), but Lehmann does not consider non-finite clauses at all. He uses greek letters for doubly-embedded subordinate clauses (Herling uses numerical superscripts for multiple embedding).

[0.31] Lehmann uses different kinds of scripts to distinguish different grades of embedding. He uses capital letters for main clauses, lower-case letters for subordinate clauses and greek letters for doubly-embedded clauses. Third-grade embedding uses Fraktur capital letters (e.g. ☒, ☓) and fourth-grade embedding uses Fraktur lower-case letter (e.g. ☐, ☑). There is even a short discussion of a fifth-grade embedding, which is indicated with numerals (Lehmann 1833: 232).

[0.32] In contrast to Herling, Lehmann's approach ignores a large part of the grammatical analysis of a sentence. However, his focus on the relation between clauses allows him in return to tackle really complex sentences. Consider, for example, the long and complex sentence in (0.5), which is a sentence from Immanuel Kant's *Anthropologie in pragmatischer Hin-*

sicht (Lehmann 1833: 125-126). The internal structure of this sentence is summarized by Lehmann with a relatively simple *Periodenbild* as shown in Figure 9.

- (0.5) Daß ferner, wenn es (das Kind) nun zu sprechen versucht, das Radbrechen der Wörter es für Mütter und Ammen so liebenswürdig macht, es beständig zu herzen und zu küssen und es auch wohl durch Erfüllung alles Wunsches und Willens zum kleinen Befehlshaber zu verziehn: diese Liebenswürdigkeit des Geschöpfes im Zeitraum seiner Entwicklung zur Menschheit, muß wohl auf Rechnung seiner Unschuld und Offenheit aller seiner noch fehlerhaften Aeußerungen, wobei noch kein Hehl und nichts Arges ist, einerseits, anderseits aber auf den natürlichen Hang der Ammen zum Wohlthun an einem Geschöpf, welches einschmeichelnd sich der Willkür eines andern überläßt, geschrieben werden, da ihm eine Spielzeit eingewilligt wird, die glücklichste unter allen, wobei der Erzieher dadurch, daß er sich selber gleichsam zum Kinde macht, diese Annehmlichkeit nochmals genießt. (Lehmann 1833: 125-126, citing Immanuel Kant *Anthropologie in pragmatischer Hinsicht* 1798: 5)

The different clauses in Figure 9 are listed below, exactly as explained in the text by [0.33] Lehmann:

- A: [clause *a* preceding] *diese Liebenswürdigkeit des Geschöpfes im Zeitraum seiner Entwicklung zur Menschheit, muß wohl auf Rechnung seiner Unschuld und Offenheit aller seiner noch fehlerhaften Aeußerungen* [clause *b* internal] *einerseits, anderseits aber auf den natürlichen Hang der Ammen zum Wohlthun an einem Geschöpf* [clause *c* internal] *geschrieben werden* [clause *d* following]
- Subordinate clause *a*: *daß ferner* [clause *α* internal] *das Radbrechen der Wörter es für Mütter und Ammen so liebenswürdig macht es beständig zu herzen und zu küssen und Willens zum kleinen Befehlshaber zu verziehen*
- *α*: *wenn es (das Kind) nun zu sprechen versucht*
- *b*: *wobei noch kein Hehl und nichts Arges ist*
- *c*: *welches einschmeichelnd sich der Willkür eines andern überläßt*
- *d*: *da ihm eine Spielzeit eingewilligt wird, die glücklichste unter allen* [clause *β* following]
- *β*: *wobei der Erzieher dadurch* [clause *⊗* internal] *diese Annehmlichkeit nochmals genießt*
- *⊗*: *daß er sich selber gleichsam zum Kinde macht*

Although Lehmann's book does not appear to have been reprinted after the first edition from 1833, it has influences later, more widely read, works by Götzinger (Section 0.0.5) and especially Bauer (Section 0.0.7), whose graphical displays will be reprinted up to 1935. Götzinger's acknowledgement indicates that Lehmann's approach might have had some real influence in didactic circles: [0.34]

Die von Herrn Director Lehmann in Marienwerden zuerst aufgestellten Periodenbilder haben bei vielen Schülern Beifall und Anwendung gefunden, und es macht mir große Freude, durch meine Lehrbücher zur Verbreitung dieser Methode, deren Verdienst ganz allein Herrn Lehmann gebührt, beigetragen zu haben.
(Götzinger 1842: x, Vorrede zur fünften Auflage)

0.0.5 Max Wilhelm Götzinger *Die deutsche Sprache* (1839)

[0.35] Max Wilhelm Götzinger (1799–1856) worked as a teacher, mainly in Schaffhausen (Switzerland). He wrote extensively about grammar, literature and dialectology, see Olsson (2009) for an extensive appraisal of his work. Götzinger also provided material for Grimm's dictionary project (Olsson 2009: 37) and he was awarded a doctorate *honoris causa* from the University of Basel in 1838 (Olsson 2009: 36), probably through his personal contact with Wilhelm Wackernagel (the father of Jacob Wackernagel of *Wackernagel's law*-fame).

[0.36] Götzinger's first major linguistic work was the *Deutsche Sprachlehre für Schulen* (Götzinger 1827), which does not contain any graphical analysis of linguistic structures. However, this work was revised and reissued multiple times up to an eleventh edition in 1875 under the auspices of his son. Starting with the fifth edition (Götzinger 1842), the graphical analysis of Lehmann is included (see Section 0.0.4).

[0.37] 1827: extensive discussion of *Periode* in the tradition of Herling, but without graphics. Götzinger is interested in possible syntactic structures Figure 10.

[0.38] The first inclusion of Lehmann's graphical display is found in Götzinger's magnum opus *Die deutsche Sprache und ihre Literatur*. Book one, part two of this multi-volume work (Götzinger 1839) includes the syntactic and stylistic analysis of german sentences.

Ein Satz, der nur aus dem Spruche und einfachen Bestimmungen besteht, heißt *nackt*. [...] 2. Hat aber einer dieser Bestandtheile wieder nähere Bestimmungen erhalten, so heißt der Satz ein *bekleideter* oder *ausgebildeter*. (Götzinger 1827: 163)

[0.39] auch schon in *Anfangsgründe* <https://google.de/books?id=IwluroIG9NkC&pg=PA168>
printed in Leipzig, first edition 1825 Periode added in fourth edition 1841: <https://google.de/books?id=IwluroIG9NkC&pg=PA168>

[0.40] meiner (1781: 446): bloßer Satz, ausgebildeter Satz, Periode <https://google.de/books?id=thZgAAAACAAJ&pg=PA446>

[0.41] Influence on Kern? (Forsgren 1998: 63) only circumstantial evidence

0.0.6 Julius Hoffmann *Neuhochdeutsche Schulgrammatik* (1839)

[0.42] Karl August Julius Hoffmann (1812-1869)

"Unter den Grammatiken der fremden Sprachen verdanke ich der Lateinischen von Billroth am meisten." (p. xiii)

[0.43] nackter und umkleideter Satz 146-148

[0.44] complex sentence p. 224

[0.45] second edition (Hoffmann 1853), basic example the same, on p. 137

[0.46] extended complex sentence on page 216-217

[0.47] new: discussion of *Periode* p. 240: (use of letters like Lehmann)

Von Perioden kann man Bilder entwerfen, indem man die Hauptsätze mit A B C, die Nebensätze ersten Grades mit a b c, die Nebensätze zweiten Grades mit α β γ , die Nebensätze dritten Grades mit δ ϵ ζ bezeichnet. So ist z.B. das Schema der eben unter Nr. 5 aufgeführten Periode folgendes: [A a α A b β : B c.]

(0.6) Es ist für denjenigen, der mit sich selbst noch nicht recht eins geworden ist, was er denn eigentlich suche und wolle, äußerst beängstigend, wenn er auf seinem Wege auf Sätze stößt, die allen seinen bisherigen Meinungen und den Meinungen seiner Zeitgenossen und der Vorwelt widersprechen: und gewiß ist diese Ängstlichkeit eine der Hauptursachen, warum die Menschheit auf dem Wege zur Wahrheit so langsame Fortschritte gemacht hat. (Hoffmann 1853: 239, citing Fichte)

[0.49] Neuhochdeutsche Elementargrammatik mit Rücksicht auf die Grundsätze der his-

torischen Grammatik

6. Auflage 1865 <https://www.digitale-sammlungen.de/view/bsb10583851?page=5>
 images: <https://www.digitale-sammlungen.de/view/bsb10583851?page=194>

Kern cites Hoffmann (Kern 1888), but only in the second edition after he already published his “tree” metaphors. The idea for the “trees” is already in “Satzlehre”, finished in December 1882, and practically applied in “Methodik” of 1883. [0.50]

0.0.7 Friedrich Bauer: *Grundzüge* (1850)

Friedrich Bauer (1812-1874) studied theology and became the founding director of a [0.51] missionary education centre in the Bavarian city of Neuendettelsau. This institute is still active today as *Mission EineWelt*. Among other duties, Bauer also taught religion and German grammar at his institute. In that context he wrote the *Grundzüge der neuhochdeutschen Grammatik für die unteren und mittleren Klassen höherer Bildungsanstalten*, which was first published in 1850. Bauer himself delivered various editions of this book up to his death in 1874.

After Bauer’s death, the (now infamous) German dictionary maker Konrad Duden kept [0.52] producing new editions of this grammar with only very minor changes. The *Grundzüge* remained popular and has seen at least 25 editions, the last one from 1908. However, that was not the end, as Bauer’s text was given a second life. After the death of Duden in 1911, Duden’s dictionary lived on and became a household name in Germany for everything related to the German language. In 1935, under the auspice of Otto Basler, the 11th Edition of the Duden dictionary was expanded with a German grammar (Basler 1935), which was basically a new edition of Bauer’s *Grundzüge* (without clear attribution to Bauer). Only after the Second World War was the grammar completely rewritten and new editions of that Duden grammar are still popular today. The graphical display is gone in this rewritten Duden grammar.²

In the grammatical analysis of complex sentences, Bauer (1850: 94-97) uses a graphical display in the tradition of Lehmann (see Section 0.0.4), although he does not explicitly cite him (Maybe Bauer got it from Götzinger?). The first similarity is that Bauer’s analysis only deals with the relation between main and subordinate clauses, not clause-internal structure. Second, and most telling, Bauer follows Lehmann’s convention to use capital letters for main sentences and lower-case letters for subordinate sentences. And finally, after a few pages of examples, Bauer comments, almost as an afterthought, that this analysis is called PERIODE, a clear implicit reference to Lehmann (and his inspiration, Herling (1823)). [0.53]

Die künstmäßige Gliederung mehrerer Sätze in beigeordneter oder untergeordneter Verbindung zu einem ganzen heißt man Periode (“The artful arrangement of multiple sentences in coordinate or subordinate juncture into a whole is called *Periode*,” Bauer 1850: 97, translation MC).

The first few basic examples of Bauer’s syntactic analysis are shown in Figure 11 (Bauer [0.54] 1850: 95). These examples are also found in exactly the same layout 85 years later in Basler (1935: 254). Each sentence is analyzed in two ways: the text itself is subdivided into clauses, with subordinate clauses shifted down vertically and connected with lines (is this inspired by Hoffmann?). Additionally, there are structural analyses in the form of letters, with capital

²more biographical info: Jahnel. Fachbereichsbibliothek Evangelische Theologie (381): C XVII Ce 93

letters for main clauses and lower-case letters for subordinate clauses. First-level subordination is separated by a comma, while secondary or deeper subordination is indicated by vertical lines (and sometimes numerical superscripts). The vertical arrangement is clearly borrowed from Lehmann (although Bauer leaves out the horizontal brace from Lehmann), but the superscripts indicate that Bauer also took notice of Herling's notation (cf. Section 0.0.1).

[0.55] This analysis is rather similar to a constituency analysis with the abstract letters indicating the node labels and the clauses being the leaves. Specifically, subordination is not linked to an explicit superordinate word (i.e. to a head as in a dependency analysis), but to a superordinate abstract entity.

[0.56] A more complex example discussed by Bauer is the sentence (0.7), analyzed as Figure 12 (Bauer 1850: 97). Again, there is both an analysis of all main and subordinate clauses, written out with subordination marked by vertical lines, and there is a structural pattern with letters and symbols in the bottom right. This structural pattern has two cases of coordination (marked by a plus symbol), an internal subordination (marked by the brackets), a secondary subordination (marked by a vertical line) and a subordination at the end of the sentence (marked by a comma). I have attempted to combine both these analysis into a single constituency tree as shown in Figure 13. The structural pattern has been used as the node-labels, while the text itself are the leaves in the tree. Probably it would have been more accurate to analyze the subordination *c* as a simple frontal embedding of the second conjunct, using a comma in the analysis instead of brackets for a clause-internal embedding (viz. *A+c,A,a+a* instead of *A+A(c)A,a+a*), but that is some minor nitpicking.

- (0.7) Er schenkte ihr 300 Rubel und als er erfuhr, daß sie in Petersburg einen Vetter habe, stellte er ihre frei, ob sie ihre Reise fortsetzen oder ob sie umkehren wolle. (Bauer 1850: 97)

I. Hauptsatz.	
1. Jakob	Subjekt.
2. schickte	Prädikat zu 1.
3. seinen	Attribut zu 5.
4. jüngsten	Attribut zu 5.
5. Sohn	Leidendes Objekt zu 2.
6. nicht	Aussageweise zu 2. (Leitf. §. 41).
7. mit den übrigen	Bestimm. Objekt. Gesellschaft zu 2.
8. nach Aegypten,	Bestimmendes Objekt. Ort zu 2.
II. Bestimmungssatz des Grundes zu 2 in I.	
1. weil	
2. schon einmal	Zeit zu 4.
3. ein Sohn,	Subjekt.
III. Eigenschaftssatz zu 3 in II	
1. den	Leidendes Objekt zu 3.
2. er	Subjekt.
3. ausgesandt hatte, Prädikat zu 2.	
Zu II.	
4. nicht zurückgekehrt war, Prädikat zu 3 in II.	
IV. Bestimmungssatz des Grundes zu 2 in I.	
1. und weil	
2. er	Subjekt.
3. fürchtete,	Prädikat zu 2.
V. Dingsatz. Leidendes Objekt zu 3 in IV.	
1. daß	
2. auch diesem	Ergänz. Objekt. Personens. zu 4.
3. ein Unfall	Subjekt.
4. begegnen möchte. Prädikat zu 3.	

Figure 5: Tabular analysis of complex sentence (0.3) with various subordinate clauses, from Becker (1833: 43).

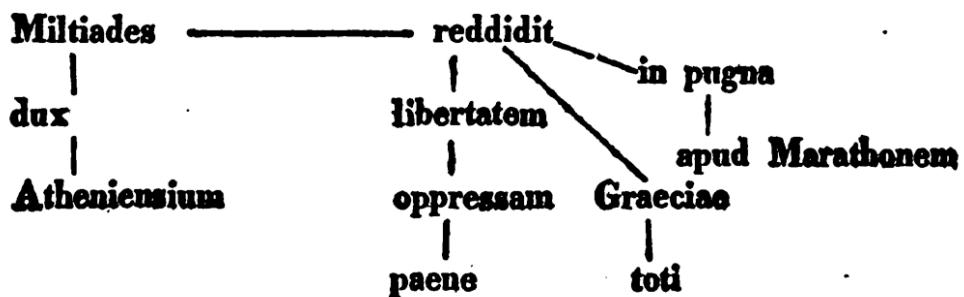


Figure 6: Graphical sentence analysis of (0.4) from Billroth (1832: 102).

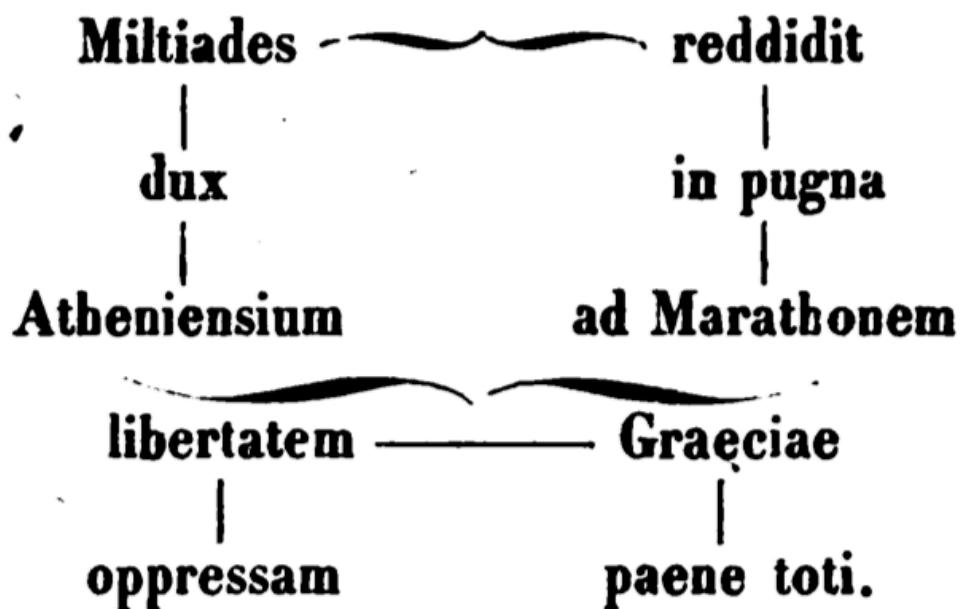


Figure 7: Revision from 1848

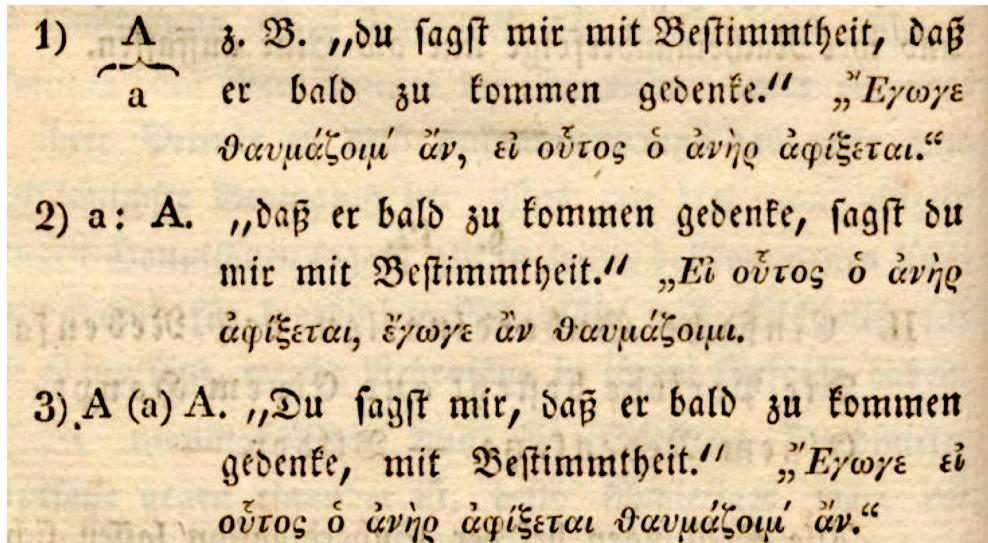


Figure 8: Three basic structural mechanisms of subordination from Lehmann (1833: 58). The first (with a horizontal brace) indicated that the subordination follows, the second (with a colon) indicates that the subordination precedes, and the third (with round brackets) indicated that the subordination is positioned internal to the superordinate clause.

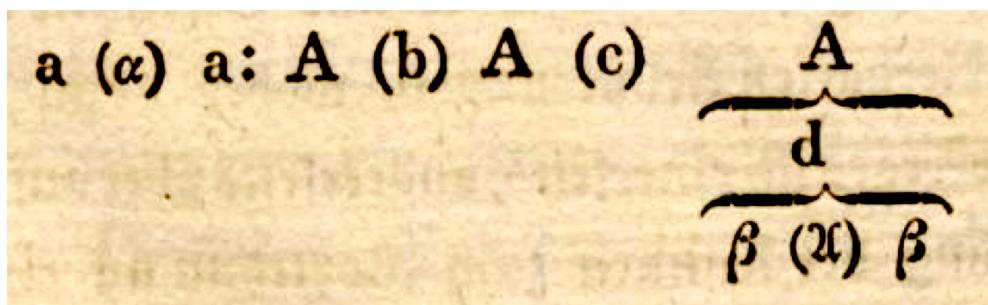


Figure 9: Lehmann's (1833: 126) analysis of Kant's sentence (0.5). The main clause is designated with a capital letter **A**, which is interrupted twice by subordinated clauses designated by lower-case letters, **b** and **c**. A further subordinated clause **a** comes before the main clause, and is itself interrupted by a second-order subordination designated by greek letter **α**. After the main clause there is yet another subordinated clause **d**, which is followed by a secondary embedding **β**, which is interrupted by a tertiary embedding indicated by a Fraktur capital letter **ϒ**.

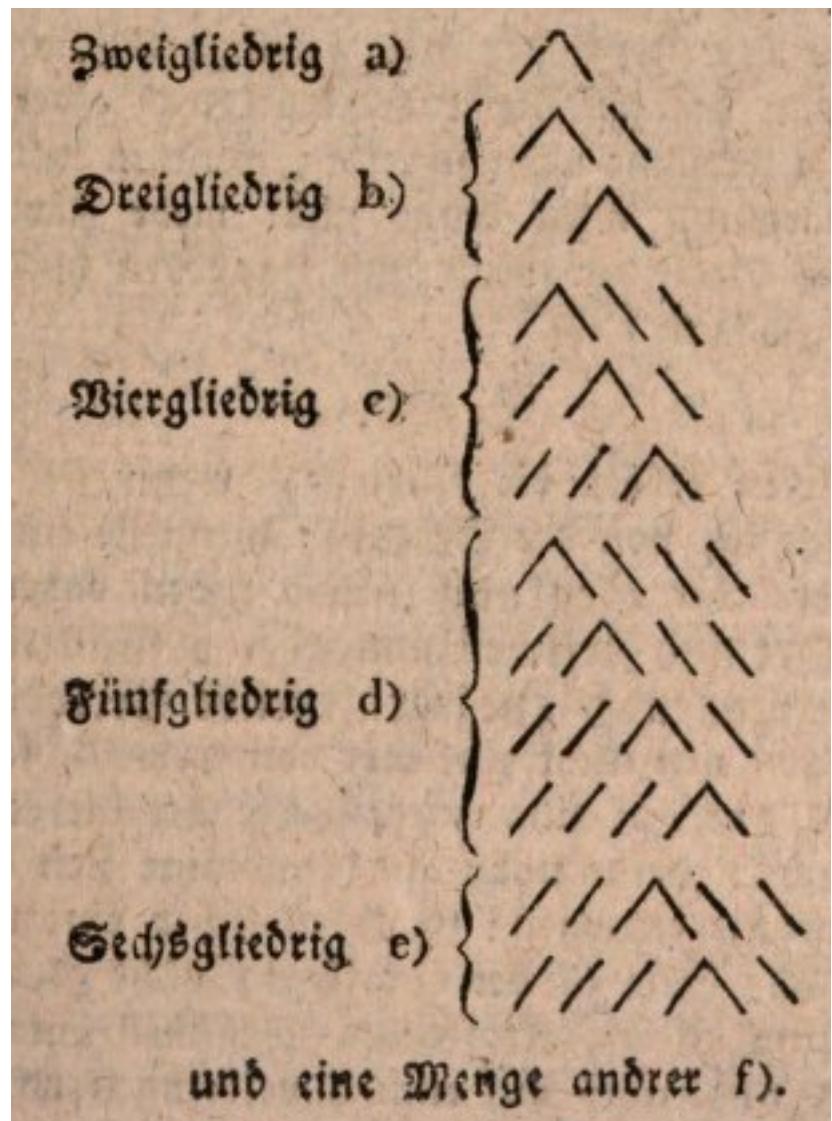


Figure 10: Götzinger's attempt to list different kinds of sentence conjunction

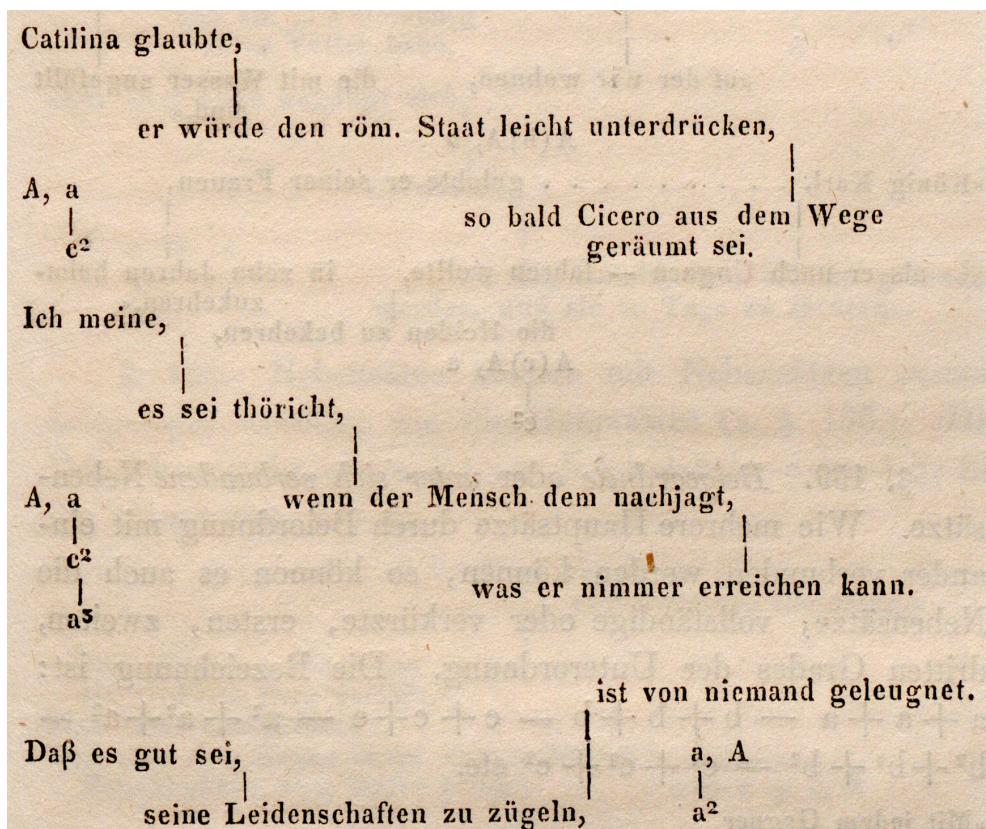


Figure 11: Basic examples of Bauer's sentence analysis (Bauer 1850: 95). There are three sentences analyzed in this excerpt, with subordination structure indicated by vertical lines and the structural patterns to the side, summarized with letters.

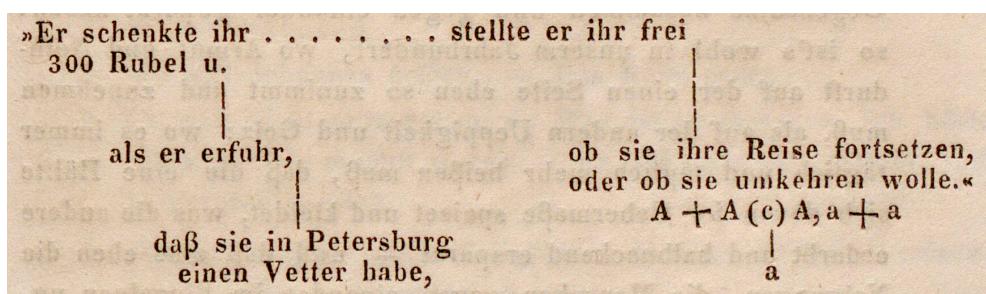


Figure 12: Analysis of the complex example in (0.7) from Bauer (1850: 97). Note both the use of vertical lines for subordination and the separate abstract analysis with symbols in the bottom right.

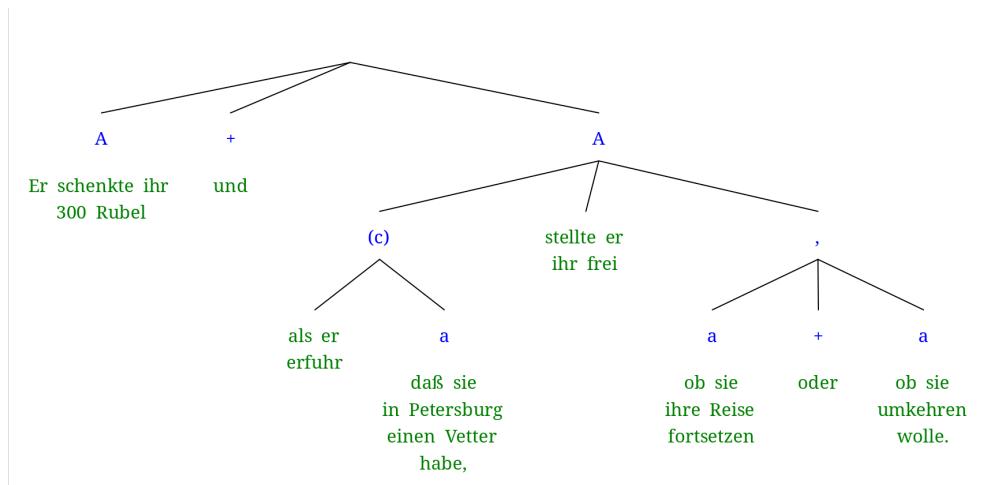


Figure 13: Display of the structure combining the text from example (0.7) and the structural letter-analysis from Figure 12 into a contemporary-style constituency tree.

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