

## FROM THE ARCHIVES

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### The University of Iowa Tractatus Map

<http://tractatus.lib.uiowa.edu/>

#### **Abstract**

Drawing on recent work on the nature of the numbering system of the *Tractatus* and Wittgenstein's use of that system in his composition of the *Prototractatus*, the paper sets out the rationale for the online tool called The University of Iowa Tractatus Map. The map consists of a website with a front page that links to two separate subway-style maps of the hypertextual numbering system Wittgenstein used in his *Tractatus*. One map displays the structure of the published *Tractatus*; the other lays out the structure of the *Prototractatus*. The site makes available the full text of the German and the two canonical English translations. While we envisage the map as a tool that we would like a wide variety of readers to find helpful, we argue that our website amounts to a radically new edition of Wittgenstein's early masterpiece, with far-reaching implications for the interpretation of that text. In particular, we claim that our visually compelling presentation of the book's overall structure delivers on Wittgenstein's cryptic claim in a letter to his publisher that it is the numbers that "make the book surveyable and clear".

#### **1. The numbering system of the *Tractatus***

The University of Iowa *Tractatus* Map project arose out of the discussion in my Fall 2015 graduate seminar on the philosophy of Ludwig Wittgenstein. We spent several weeks looking at the recent debate over how to read Wittgenstein's *Tractatus Logico-Philosophicus*,

and much of our discussion focused on the question of how best to understand its structure, and the significance of its numbering system.

The *Tractatus* is very short, but it is also extraordinarily concise, and an intricate numbering system is used to indicate the relationship between its highly condensed parts. Wittgenstein later said that every sentence should be seen as a chapter heading. Even though the *Tractatus* has generated an enormous secondary literature, there is no scholarly agreement about even the most elementary exegetical matters. (For a brief history of *Tractatus* interpretation, see Stern 2003.) For the last twenty years, the principal focus of interpretive debate has been between supporters of a “traditional” argumentative reading, on which the book is construed as arguing for a systematic conception of the nature of language, logic, and representation, and “resolute” readers who contend that the traditional reading misses the whole point of the book: once we understand the author, we will see that the book – and the argument presented within – is nonsense. However, a few scholars on both sides of that divide have advocated a new way of reading the book, one that challenges a basic assumption that has previously been taken for granted by almost all interpreters on both sides of this debate, an assumption so obvious that it was very rarely explicitly articulated, and had seemed to need no defense (Bazzocchi 2007, 2014, 2014a, 2015; Hacker 2015; Kuusela 2015). The assumption in question is that the book should be read sequentially, from beginning to end. In other words, until very recently almost all readers have presupposed that one should start at the first sentence on the first page and end at the last sentence of the last page. The new alternative that has been proposed is that the book should be read as a hypertext, a tree-structure defined by the author’s numbering system.

Given that the *Tractatus* was written during the first world war, and published in 1922, and the term “hypertext” was first coined around 1965, the proposal that we approach that book as a hypertext is bound to seem incoherently anachronistic at first sight. Indeed, if one relies on the Wikipedia definition of hypertext as “text displayed on a computer display or other electronic devices

with references (hyperlinks) to other text which the reader can immediately access, or where text can be revealed progressively at multiple levels of detail” (<https://en.wikipedia.org/wiki/Hypertext>), it follows that the very idea of hypertext presupposes the existence of electronic computers. However, in a broader sense of the term, a hypertext is any non-linear text, any text “which contains links to other texts” (<https://www.w3.org/WhatIs.html>). The decimal numbering systems of the *Prototractatus* and *Tractatus* works in precisely that way: each remark begins with a number which indicates its relationship to those remarks above, below, or neighboring it in the tree structure which connects those remarks.

The *Tractatus* consists of a series of numbered remarks, arranged in numerical order. The top level ones are numbered 1 to 7; decimal numbers are used to indicate the structure of the supporting paragraphs. When Wittgenstein’s publisher asked him if he would be willing to give up the decimal numbering he replied categorically: “the decimal numbers of my remarks absolutely must be printed alongside them, because they alone make the book surveyable and clear, and without this numbering it would be an incomprehensible jumble” (Wittgenstein, letter to von Ficker, 6 December 1919, translation from Hacker 2015, 652). A footnote attached to the first remark in the *Tractatus* explains the numbering system as follows:

The decimal numbers assigned to the separate remarks indicate the logical weight of the remarks, the stress laid on them in my exposition. The remarks *n.1*, *n.2*, *n.3*, etc., are comments on remark No. *n*; the propositions *n.m1*, *n.m2*, etc., are comments on the remark No. *n.m*; and so on. (TLP, p. 7, my translation)

Most interpreters have either ignored these instructions, or failed to understand their significance. The majority of *Tractatus* interpreters pass over them in silence. However, the footnote makes it quite clear that the numbering system has the structure of a logical tree, or a quite specific kind of hypertext. Recent research on the origins of the *Tractatus* has shown that Wittgenstein relied on the numbering system to organize his work on an earlier manuscript draft of the book (Wittgenstein, MS 104), rearranged

and published in numerical order as the *Prototractatus*, and that the hypertextual grouping of remarks is crucial for an understanding of his work on constructing and rearranging the text.<sup>1</sup>

## 2. Earlier maps – digital and others

Earlier attempts to construe the numbering system of the *Tractatus* that did not dismiss it out of hand, a tradition that goes back to de Laguna's review of the book (1924) and Black's *Companion to Wittgenstein's Tractatus* (1964, 2), either concentrated on the hierarchical, or parental, relationship between remarks that comment on one other, or looked for an arcane system hidden behind the numbers. In other words, they focused on the relationships between remarks such as  $n$  and  $n.m$ , and between  $n.m$  and  $n.m1$ , and so on, to use the terminology Wittgenstein introduced in his footnote to remark 1. There are a few exceptions to this general rule; the most striking and detailed is Mayer (1993) who concentrates on the origins of the numbering system. Both Mayer (1993) and Gibson (1996) provide helpful surveys of previous interpretations.

What the usual approaches to the numbering system of the *Tractatus* overlook is that Wittgenstein also draws our attention in that footnote to the sibling relations between remarks at the same level on the tree with a common parent, such as  $n.1$ ,  $n.2$ ,  $n.3$  etc., and  $n.m1$ ,  $n.m2$ , etc. Indeed, it is these *series* of sibling remarks that he characterizes as comments on the remark at the next level up. The series of remarks that go together to form the series of comments that Wittgenstein describes in his introductory footnote (remark  $n$  and the series of comments  $n.1$ ,  $n.2$ ,  $n.3$ ; remark  $n.m$ , and the series of comments  $n.m1$ ,  $n.m2$ ) are usually interspersed among other remarks, and are often on different pages of the printed text. As a result, it is very difficult to read the remarks in the order defined by the hypertextual numbering system while working with the traditional printed text. So a leading rationale for the design of any *Tractatus* hypertext is to bring out the importance of these

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<sup>1</sup> See McGuinness 1989, 2002; Mayer 1993; Bazzocchi 2007, 2010, 2014, 2014a; Hacker 2015, Pilch 2015, 2016.

connections between remarks that form part of a single branch of the logical tree.

Kraft (2016, 97, fn6) has argued that this attention to two kinds of relations between nodes shows that the tree reading of the *Tractatus* is “not a tree in the logical or mathematical sense.” The reason he gives is that mathematical trees contain only one type of relation between nodes, while Bazzocchi’s and Hacker’s diagrams need “two kinds of lines, solid and dashed, to represent the ‘comment on’ relation and the ‘belongs to the same set of comments as’ relation”. However, their use of a second kind of line to draw the reader’s attention to the sets of sibling remarks is purely a notational device, for the relationship of siblinghood can be analysed without residue in terms of the parental relation: two comments are siblings just in case they have the same parent.

The real problem with such logical tree representations of the *Tractatus*, however, is not a matter of logic, but the fact that the need to draw so many lines, connecting a parent with each of its offspring and each sibling with the ones that come before and after, makes it impossible to legibly represent more than a small fraction of the whole structure on a single page. While it is, of course, possible to depict the numbering system of the *Tractatus* by drawing a tree with 1, 2, 3... 7 arranged horizontally at the top, as the trunk of the tree, and then draw roughly vertical links downwards from each of them to each of the related remarks with one decimal, and so on, the upside-down tree that results rapidly becomes extremely complicated if one tries to include all the remarks. It is not only difficult to draw such a map, but more important, almost impossible to fit more than a small fragment into a single frame. Bazzocchi’s many diagrams of the tree structure of the *Tractatus* in his publications are always very selective. His diagram of the tree structure of the several dozen remarks on the first five pages of MS 104 (2014, 83) is fairly close to the limit of what can conveniently fit onto a single page.

Laventhol (1996), the oldest surviving *Tractatus* map, includes a link to an extraordinarily long, narrow, and unobtrusive map which serves as a good illustration of the problems faced by any attempt to map the *Tractatus* using a conventional approach. See:

<http://www.kfs.org/jonathan/witt/mapen.html>

A very similar map is included on Bazzocchi's *Tractatus* site:  
<http://www.bazzocchi.net/wittgenstein/tractatus/eng/mappa.htm>

Pasin, who has designed several imaginative *Tractatus* sites, provides a more compressed rendition of the whole as a logical tree by using polar co-ordinates and a shifting center, but despite this ingenuity, one can only look at a small fraction of the whole at any one time:

<http://hacks.michelepasin.org/witt/spacetree#.WC4P5Mk-KX8>

### **3. Mapping the *Tractatus***

The original motivation for the University of Iowa *Tractatus* Map was to find a way of representing the structure of the *Tractatus* numbering system in a more compact and simple way. It is built as a subway-style map which displays each remark as a station, and each series of remarks which comment on a parent remark as a subway line branching off a junction station. This makes it easy to examine the arrangement of the various series of remarks described in the introductory footnote, together with the remark that they comment on. The site consists of three main pages: a brief introductory front page, with links to two separate maps. One map displays the structure of the published *Tractatus*, while the other lays out the structure of an earlier draft, known as *Prototractatus*. It also provides access to the full text of each line on those maps, in German and the two canonical English translations.

Phillip Ricks drafted the first version of the *Tractatus* map, using a pencil and graph paper, while taking part in my graduate seminar on Wittgenstein's philosophy. I turned it into an Excel spreadsheet, and suggested that we use it as the basis for an online map of both the *Tractatus* and the *Prototractatus*. Landon Elkind, another seminar participant, joined us in working on the design of the online map, and made a crucial contribution to the *Prototractatus* part of the project. The construction and design of the website was done by Matthew Butler and Nikki White at the University of Iowa Library's Digital Scholarship and Publishing Studio. We are grateful to Kevin Klement for his careful editorial work on the public

domain English and German editions of the *Tractatus* used on the site (Wittgenstein 2016).

We strongly recommend looking at our web-based interactive maps of the [Tractatus](#) and [Prototractatus](#) to see how the map performs this orientational function, and the next two paragraphs are intended to be read while looking at those maps. The yellow main line at the top of each of the full-map pages, represents the series of whole-numbered remarks, (1, 2...7), each of which is represented by a station on that line. The red and pink lines, branching off each of the first six remarks (1.1, 1.2, 1.3; 2.1, 2.2, 2.3; 2.01, 2.02, 2.03... and so on) represent the series of remarks that comment on the whole-numbered remarks. Further levels of comments are represented by lines in orange, green, aqua, blue, purple and grey. Lines containing one or more zeros are in fainter versions of the corresponding colour. Readers can zoom in on any part of the map, and then move around in it, or zoom out to see the whole. Clicking on the individual numbered stations, each of which stands for a remark in the text, brings up a panel containing the associated text. Clicking on the lines connecting the stations, each of which stands for a series of sibling remarks and the remark that they comment, brings up a panel containing the text of those remarks. For instance, clicking on the line that includes *n.3* brings up the text of the whole of that branch (e.g., *n.1*, *n.2*, *n.3...*), with the text for the junction station, the remark that it comments on, namely *n*, at the top. The default text is the German original, but a dropdown menu in each text panel allows the reader to choose either of the canonical English translations.

Approaching the *Tractatus* as a hypertext in this way is not just a matter of coming up with a striking way of representing the numbering system. It amounts to a radically new edition of a canonical text, with a number of far-reaching implications for the interpretation of that text. In the past, it has been taken for granted that the text should be read sequentially, in numerical order. But the hypertext consists of a series of branching and interconnected groupings of remarks, represented by the lines that connect the stations on our subway map. For instance, if we read the text sequentially, remark 2 is preceded by 1.21 and succeeded by 2.01.

But if we take the author's footnote seriously, it should also be seen as (a) coming after 1, and before 3, 4, 5, 6 and 7 (b) being commented on by two further series that branch off from it, namely 2.1, 2.2, 2.3 and 2.01, 2.02, 2.03... 2.07.

#### **4. Mapping the Prototractatus**

Thanks to the work of Brian McGuinness (1989, 2002) we know that the source manuscript for the *Prototractatus* (Wittgenstein 1971) provides a chronologically ordered log of the polished paragraphs that would later be rearranged and revised in the production of the *Tractatus*. While a facsimile of MS 104 is included in the first and second editions of the *Prototractatus*, the published text does not include an edited text of the manuscript in the order it was written. Instead, the remarks were rearranged by the editors in numerical order. Indeed, in the critical German-language edition of the *Tractatus*, which includes the full published text of the *Prototractatus*, together with detailed information about how each remark was revised (Wittgenstein 1989), and there is no information about the original order of the remarks, and no tables or other apparatus that would aid the reader in studying MS 104.

When Wittgenstein began to assemble the material that would ultimately be rearranged and reorganized in the familiar numerical order from 1 to 7, he had not yet finished writing it, and had not yet worked out how to arrange the parts that he had written. Consequently, the manuscript of the remarks that we now know as the *Prototractatus* could not be written up in the sequential, numerical order in which the book was published. However, sometime during World War I, Wittgenstein worked out the ingenious numbering system that enabled him to organize, review, and repeatedly reorganize his work in progress, despite the very limited resources available to him while serving as a soldier. As a result, the manuscript containing the first known draft of his book (MS 104 in von Wright's numbering system, sometimes known as Bodleianus, because it is owned by the Bodleian Library in Oxford), began with the first six whole-numbered remarks on the first page of the main text (Pilch 2015), and then repeated that



series, together with almost all the remarks with a single decimal through 4.4, on the next page.

After that, remarks were written down as Wittgenstein decided to make use of them, and each remark prefaced by a decimal number indicating its ultimate location in the sequence. The next page contains double decimal remarks appended to the whole number and single decimal remarks that formed the initial backbone for the growing book draft. Progressively higher-numbered remarks soon make an appearance, but throughout the process of construction recorded in MS 104, remarks are added to the tree-structure, not to a numerical sequence.

In October 1915, Wittgenstein wrote to Russell that he had recently done a great deal of work, and that he was “in the process of summarizing it all and writing it down in the form of a treatise (*Abhandlung*). ...If I don’t survive [the war], get my people to send you all my manuscripts: among them you’ll find the final summary written in pencil on loose sheets of paper” (Wittgenstein 2012, 84-85). That loose-leaf “final summary” has not survived, but it is likely that it consisted of some kind of a tree-structure arrangement of his book in progress, as a sequentially-ordered arrangement would have involved constant and extensive additions to what had already been composed, while inserting material into sheets containing remarks arranged in a tree structure would have been simple. Certainly, it would have been impracticable to take in either the hypertextual structure or the sequential arrangement of the projected treatise by reviewing MS 104, the bound ledger containing a chronological ordered record of his additions to the book draft.

Thus, while the published *Prototractatus* looks very similar to the final *Tractatus*, the source manuscript on which that book was based was put together in a very different way. From each of the first six whole-numbered remarks, numerical sequences branch, starting with one-decimal series such as 1.1, 1.2; from these nodes, further branches stem.

When MS 104 was first discovered by von Wright in 1965, who took charge of preparing the text for publication over the next few years, the full significance of the order in which the remarks were

written down was not yet appreciated. As a result, the focus of that book and of von Wright's introductory essay (1971), is on the path to the *Tractatus*, not the composition of MS 104. This is already made clear in the wording of the book's subtitle: "an early version of *Tractatus Logico-Philosophicus*". Consequently, the text of the first 103 pages was printed in the familiar numerical order, while last fifteen pages of "corrections" were left out, as they belonged to a later stage of revision that could not be fully reconstructed from the available evidence. The immediate result of this enormous amount of careful and conscientious scholarly work was very disappointing: it was hard for the first generation of readers of the *Prototractatus* to see what, if anything, there was to be gained or learned from this edition. The edited text looked too much like the familiar text of the *Tractatus* to be instructively different, while the facsimile of the original seemed quite opaque.

Most reviewers damned the book with faint praise. W. D. Hart's review in the *Journal of Philosophy* is exemplary in this respect:

This volume has been handsomely and thoroughly wrought. Indeed, the book may even have been overdone. I suspect that its hefty price tag may be due in no small part to the inclusion of a 120-page photocopy of Wittgenstein's handwritten manuscript; yet I have some doubt that the facsimile of the master's original text is of sufficient scholarly utility to justify the heavy tariff its inclusion occasions. ... In preparing the printed German text, the editors rearranged the numbered remarks in the manuscript in Wittgensteinian numerical order, though they have included page references to locate the remarks in the manuscript; it *might* prove interesting to know in which "contexts" which remarks were inscribed by Wittgenstein. (Hart 1973, 19)

Over and above remarks present in the one text but not the other, the *Tractatus* and the *Prototractatus* differ considerably in the orderings of those remarks they share. On page four of his historical introduction, von Wright says that these "are probably the most interesting differences between the two works". Unfortunately, von Wright says nothing to arouse any such interest in his readers. (Hart 1973, 24)

At this point, it may be helpful to take a step back and consider the similarities between scholarly editing of philosophical texts in general, and Wittgenstein texts in particular, and home

improvement projects. In both cases, one can draw a very similar graph of happiness over time. Both start out with great enthusiasm and excitement over the promised results; there is then a steady decline as one becomes aware of all the problems involved; and finally satisfaction rises again as results are achieved. But while, in the case of home improvement, morale usually recovers as the project is completed, in the case of scholarly editing, it can take much longer to fully appreciate what has been accomplished. Often, it is only too easy for critics to point out how much better the job could have been done, without taking into account the fact that we can only see how it could be improved because we can make use of the work already done by our predecessors. If we can see so much further than the previous generation, it is because we are standing on their shoulders, or building on their accomplishments, when we do so. Indeed, while von Wright did not himself provide any further discussion of the “the most interesting differences between the two works”, his work made those materials available in a form which provoked others to identify those differences, and this may well have been one of his most important contributions to our understanding of the complex relationship between MS 104, the *Prototractatus* and the *Tractatus*.

However, until very recently only the most ardent scholars have been in a position to study even the principal earlier stages, usually known as the ‘core’ *Prototractatus*, which ends at a dividing line on page 28 of the manuscript, and the so-called *Proto-Prototractatus*, which ends at a similar dividing line near the bottom of page 70. Researchers can consult Schmidt (2016) and Pilch (2016) for facsimiles and transcriptions of many of the key documents, and there is a wealth of information about the structure of MS 104 and its relationship to both the *Tractatus* and *Notebooks 1914-1916* in Geschkowsky (2001). However, all this material is only available in German, and its overall structure is far from easy to take in.

In addition to providing a subway-style map of the complete text of the *Prototractatus*, or the first 103 pages of MS 104, our map site also provides parallel access to the earlier stages, or “strata” of composition, contained within the source manuscript for the *Prototractatus*. By choosing different start and end pages at the top

of that map, one can look at different stages in the construction of the *Prototractatus*: the chosen pages are in color, the others are greyed out. In this way, one can look at the text of different stages in the construction of the *Prototractatus*, and map the changing arrangement of the project as it was gradually assembled. However, because the site is intended as a resource for interpreters with very different approaches, and the dating of these stages is a matter of debate (see von Wright 1971; McGuinness 1989, 2002; Geschkowski 2001; Kang 2005; Potter 2013; Bazzocchi 2015; Pilch 2015), we do not build in any particular hypothesis about the dating of the various stages of composition of the *Prototractatus*. Instead, we simply provide information about the page on which each remark first appears, and leave it to the reader to explore the various layers.

The principal goal for the next stage of the University of Iowa *Tractatus* Map project is to connect up our maps of *Tractatus* and *Prototractatus*, in order to provide an equally graphic and accessible map of the process of revision that led from *Prototractatus* to *Tractatus*. Because very little wording is added or removed at this late stage in the composition of the final text, the vast majority of remarks in the *Tractatus* have a clear antecedent in one or more *Prototractatus* remarks, and very few remarks in *Prototractatus* have nothing corresponding to them in *Tractatus*. In other words, the alterations in question are primarily a matter of rearrangement and reorganization of a highly structured text. The overarching organization is largely retained: the top seven whole-numbered remarks are left unchanged, and while many remarks are moved around by changing their decimal number, very few are moved to a different whole-number category. There are no structurally significant changes to the remarks grouped under 1 and 7, so the task of mapping the changes from *Prototractatus* to *Tractatus* can be broken down into five independent sub-tasks: showing the process of revision with groups 2, 3, 4, 5 and 6. A surveyable map of the various stages of composition and rewriting involved in Wittgenstein's construction of the *Prototractatus*, and ultimately the final text of the *Tractatus* should tell us a great deal about the structure of the book.

## 5. Conclusion

Our site's innovative map of the *Tractatus* provides a new and visually compelling presentation of the book's overall structure. It thus delivers on Wittgenstein's cryptic claim in the letter to the book's publisher that the numbers "make the book surveyable and clear". "Surveyable" (*übersichtlich*, literally, overview-able) is a key term of art for Wittgenstein, and carries the sense of making it possible to take in a complex structure at a glance, in the way that one can grasp the lay of the land by looking at a landscape from a well-placed hill or tower. Crucially, it is possible to look over our subway-style maps as a whole, and to examine the structure of each part. Conventional tree diagrams are much more visually complicated, so much so, that they are normally only used to show a small part of the book's overall structure at one time. In other words, our map is far easier to take in visually, and it is possible to look at the whole thing at once.

As previously mentioned, the great majority of readers of the *Tractatus* take it for granted that it should be read and interpreted in sequential numerical order, as published. Very recently, Bazzocchi, Hacker and Kuusela have argued against this approach, contending that one should only read the text as a logical tree, or a hypertext, in the order of the lines on our map. They also contend that separate branches of the tree do not cross-refer, or inform each other. The first full-blown defence of a sequential reading that responds to their construal is published in the present issue of this journal (Kraft 2016).

Because we envisage the map as a tool that we would like a wide variety of readers to find helpful, rather than advocate for a particular scholarly interpretation, we do not take a position on these exegetical issues on the site. For this reason, the front page provides a bare minimum of introductory information about the site and the texts it presents. Our own considered view is that both of these are legitimate and appropriate interpretive strategies, while holding that either one of them is the only correct way to read the text is a mistake. We believe that we need to pay attention not only to the final sequential order in which the book was published, but also to the hypertextual arrangement determined by the book's

numbering system. Both Hacker (2015) and Kraft (2016), who seem at first sight to be on diametrically opposed sides in this debate, are actually somewhat equivocal on this very issue. Notably, after observing that

it is useful to distinguish between the thesis that the *Tractatus* can be read and interpreted as a tree and the thesis that it must be read and interpreted that way (Kraft 2016, 98, fn 8)

Kraft goes on to maintain that as “the weaker thesis is too non-committal”, and he construes the tree reading as defending the stronger thesis. He then points out that in the first full paragraph of his paper, Hacker states what is clearly a version of the weaker thesis, recommending that one “avoids reading the work only consecutively, and also reads it tree-wise” (2015, 649). Indeed, if one takes the very next sentence of Hacker’s paper out of context, it reads like an extremely insistent statement of the strong thesis:

The *Tractatus* must be read in accordance with the numbering system, and that demands that the reader follow the text after the manner of a logical tree... (Hacker 2015, 649)

In view of its setting, on the other hand, this sentence seems to be doing no more than insisting and demanding that one must not only read the work consecutively, but also read it as a logical tree. Nevertheless, shortly after making his observation about Hacker, Kraft makes a strikingly similar move. After expressing his conviction that where the tree reading and his own reading conflict, his own reading is clearly superior, he observes that it is not a bad idea

to keep in mind that both interpretations of the numbering system exist and can both be applied whenever discussing specific (series of) remarks. (Kraft 2016, 103)

In this paper I have appealed to two different, but related, reasons for reading the book as a hypertext. The first is an argument “from above”: we should take the author’s instructions at the beginning of the book about the relations between the remarks seriously, and respect his insistence that without the numbers the book would not be surveyable or clear. The second is an argument “from below”: we know that the author relied on the numbering

system to organize his successive drafts of the book when he wrote it down in MS 104, and looking at a map of the various stages makes it possible to survey that process. But neither these arguments, nor any other I have encountered in the literature on the numbering system of the *Tractatus* proves that it should only be read in this way. In the end, the question of how best to read those remarks is one that can only be settled passage by passage, by means of a close reading and evaluation of all the relevant texts.

In the last paragraph of the preface to the second edition of *Prototractatus*, Brian McGuinness expressed the hope that it would be possible

at a future date to supplement this facsimile and printed version by an electronic version which will facilitate the comparison of the various stages described here, as well as permitting a number of other analyses both of this and the *Tractatus* itself. (McGuinness 1996, xii)

In the final paragraph of a paper on the composition of the *Tractatus* presented at the 2001 Kirchberg Wittgenstein Symposium, he observed that:

the execution and still more the presentation of such analyses are much facilitated by the use of electronic devices, search engines, data bases, Excel and so on. In an ideal world we could all have access to one another's constructions of this kind on the Internet, whether promiscuously or as members of a club. It is important that they should be accompanied by rationale, by discussion, and interpretation. (McGuinness 2002, 282)

When I heard him give that paper, that world seemed very distant from our own. In the recent past, it has become much closer.<sup>2</sup>

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<sup>2</sup> Earlier versions of parts of this paper were presented at the “Von Wright and Wittgenstein in Cambridge: von Wright Centenary Symposium”, held at Strathaird, Cambridge, UK, at a session on early analytic philosophy organized by the Society for the Study of the History of Analytic Philosophy at the American Philosophical Association’s Central Division, held in Kansas City, and (via videolink) at the 9th Summer School on Mind and Language, organized by Luciano Bazzocchi at the University of Siena, Italy. I learned a great deal from the discussion at all three events, and my Fall 2015 graduate seminar at the University of Iowa, and want to express my gratitude to everyone who took part.

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