# WITTGENSTEIN IN DIGITAL FORM: PERSPECTIVES FOR THE FUTURE

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## 1. The digital turn

We live in a time of rapid technological change which is revolutionizing the way information is stored, shared and put to use. This revolution is most notable in commerce, the professions (medicine, law, scientific research) and in the news and entertainment media. It is least notable in the humanities.

This trend reinforces itself over time. If (for example) professional schools and scientific research require more and more digital resources to function in a modern economy, and work in the humanities does not, this effects a shift in the allocation of fixed resources at universities towards the former from the latter. The result is to alter not only the relative availability of resources in these fields but also the relative prestige and attractiveness of these disciplines to teachers and students. Meanwhile, the accessibility of the humanities is decreased as the gap grows between its forms of expression and those of the society at large.

It is an important political and sociological question to wonder about this shift. What effects does it produce in the general culture of society? And what further effects are produced in fundamental social factors like family integrity, child-care, crime, environmental protection, and so on? These matters far transcend the narrow borders of advanced research in the humanities and yet are importantly related to it through their common connections to culture.

For these reasons, and also because the transmission of culture is dependent upon its periodic transformation into new media (as happened with the alphabet and with the printing press), the question of the relation of electronic media to the humanities, and to culture as a whole, is one to which focused consideration must be given.

Heidegger and McLuhan were already investigating this question around 1950. Heidegger's introductory 'Hinweis' to his 1949 'Einblick in das was ist' lecture series begins: "Alle Entfernungen in der Zeit und Raum schrumpfen ein. [...] Den Gipfel aller Beseitigung aller Entfernungen erreicht die Fernsehapparatur." (*Gesamtausgabe* Bd. 79, p. 3) McLuhan, who similarly predicted the transformation of the world into a 'global village', published *The Mechanical Bride*, his study of advertising as a cultural form, in 1951. His *Gutenberg Galaxy* (1962) and *Understanding Media* (1964) offer a history and a phenomenology of the cultural effects of new media which continue to deserve critical attention.[1]

In this context, Wittgenstein has an important role to play on account of three factors:

(a) Wittgenstein research has advanced further in the direction of digital research than has the research on any other figure in the philosophical tradition. Wittgenstein research is therefore able to function as a model for research elsewhere in the humanities.

(b) Wittgenstein's thought (as a way of thinking and as a body of texts expressing and exemplifying that way of thought) amounts to a critique of

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1. A Wittgensteinian strain in McLuhan's work may be seen in his 1960 'Report on Project of Understanding New Media' for the US Department of Health, Education and Welfare (HEW): "[Students] already live in a 'field' of knowledge created by new media which, though different in kind, is yet far richer and more complex than any ever taught via traditional curricula. The situation is comparable to the difference between the complexity of language versus the crudities of traditional grammars used to bring languages under the rule of written forms. Until we have mastered the multiple grammars of the new non-written media, we shall have no curriculum relevant to the new languages of knowledge and communication which have come into existence via the new media. These new languages are known to most people but their grammars are not known at all. We have 'read' these new languages in the light of the old. The result has been distortion of their character and blindness to their meaning and effects." (Cited in 'McLuhan: Hot & Cool', edited by G.E. Stearn, 1967, p. 156)

book culture both as regards its content and its form. Where print texts necessarily proceed step by step in linear fashion, Wittgenstein's thought is repetitive, disjunctive and often regressive. This complex and multi-layered way of thinking can be presented in digital form in ways which are difficult or impossible in print. Wittgenstein's thought is therefore itself located at just that junction of print and digital forms of media which requires our attention in ways which are fundamental to our present and future.

(c) Wittgenstein's work, it may be argued, amounts to an extended argument that the nature of the world, hence also the nature of human beings and of human experience, is *digital*, not *analog*. When he states, for example, that "Den verschiedenen Netzen entsprechen verschiedene Systeme der Weltbeschreibung." (*TLP* 6.341), he is putting forward the view that all intelligibility derives from co-ordinate systems, 'nets', whose internal qualities and whose external explanatory fit to the world, can be described only in further systems of the same type. No explanation could ever somehow reach 'beyond' such a system because intelligibility and coordinate systematicity are co-extensive. That such systems exist at all, and that they do in fact explain, are mysteries whose acceptance is always already in place when human beings speak or otherwise go about their business in the world. It is possible that the explosive consequences of the digital turn can be investigated and hence meliorated only by a thinking, like Wittgenstein's, which understands the enormous power of this turn by accepting, and working from, its fundamentality.

## 2. Wittgenstein as test bed for electronic humanities scholarship

Five years ago, InteLex (http://www.nlx.com) decided to build a 'research platform' for Wittgenstein scholarship. It was intended to be a first example of the sort of desktop which, we thought, would gradually become standard, in an electronic environment, for research into historical figures in the humanities. Such a research platform would be available on the internet and would be purchased by university libraries for scholarship in the humanities on the model of computer resources which are everywhere provided to the physical sciences, medicine, law and business. It would include cross-searchable content like the following:

- works (in original and translation)
- papers and drafts
- correspondence
- lecture notes
- conversations
- memoirs and other biographical materials
- secondary literature
- journal articles
- conference proceedings
- language dictionaries and other reference works
- related primary works from other authors (sometimes with their own research platforms)

Such a digital research platform would supply most of the functions of the traditional scholarly desktop with its journals and books from different print publishers and its photocopies from print and microfilm sources. Access to titles and the speed and accuracy of searches would, of course, be much improved, as would integration with word-processing programs.

It was clear from the start that the tastes and habits of individual researchers would not always take to this new possibility immediately. Other significant hurdles to be surmounted would include the need to reach electronic licensing agreements with multiple publishers, to digitize works previously available only in print to an exacting (and therefore expensive) standard, to provide powerful search tools which would function over the internet with a variety of browsers and operating systems, and, finally, to convince librarians that digital resources for the humanities should receive the same sort of funding as they do in other fields of research.

Now, in late 2004, a progress report may be made. What has been accomplished? What remains to be done?

Wittgenstein was chosen for an initial attempt at a research platform for a variety of reasons. InteLex already had his 'published works' available in digital edition from Hans Kaal and Alastair McKinnon,[2] and the outstanding *Bergen Electronic Edition* of the *Nachlass* was about to join it under a distribution arrangement with Oxford University Press.[3] InteLex had also licensed the OUP/Duden English-German dictionary. Together, these databases already provided a unique basis for a research platform, since no other phi-

losopher had such relatively complete electronic resources available at the time. Claus Huitfeldt and his colleagues in Bergen had recognized the possibility of a digital edition of the *Nachlass* already in the late 1980s and had then worked for over a decade to provide a tool for Wittgenstein scholarship which was, and remains today, unparalleled in the field.

Then, too, a research platform for Wittgenstein seemed particularly appropriate since all but one of his 'works' are selections from his *Nachlass* made after his death by editors. It is highly important for research into these works that they be seen against the background of the original texts from which they were excerpted. Following and evaluating such editorial intervention is possible using digital technology in ways which are either difficult or impossible on paper. Perhaps even more important, Wittgenstein's way of thinking through philosophical issues was often to revise, reorder and generally revision his previous work. Again, digital technology allows these involuted paths as they are represented in the *Nachlass* to be specified and emulated in ways which are otherwise impossible.

Building out from this base, the next step was to approach Blackwell and the Wittgenstein Trustees in regard to the translated Wittgenstein titles. Happily, agreement was eventually obtained to license both the Blackwell translations of Wittgenstein's primary works (i.e., everything except the *Tractatus*) and Blackwell's secondary texts including collections of letters, lectures, conversations and memoirs. Since some of these titles were out of print, another advantage of the digital desktop became apparent: keeping works in circulation which publishers had decided, or been constrained in some way, not to reprint.

At the same time, InteLex began association with the Brenner-Archiv at the University of Innsbruck. A database of *Tagebücher und Briefe* was pub-

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2. This edition included, in their original language, all of the individual Wittgenstein titles which have been issued as books or in journals. In the meantime, this edition has unfortunately become unavailable due to copyright confusion between the English and German publishers. But nearly all of its content remains available in the *Nachlass* and *Collected Works* databases.

3. The *Nachlass* is available from InteLex and Oxford University Press on CD, with and without facsimiles, but also, in the normalized version only, and only from InteLex, on the internet.

lished with Wittgenstein's diaries from the 1930s and a selection of corre-spondence from the *Gesamtbriefwechsel* project which the Brenner-Archiv had been pursuing since 1988.

Now the entire *Gesamtbriefwechsel* is finished and published (as of October 2004). This important database includes more than 2300 pieces of corre-spondence to and from Wittgenstein and is fully compatible with the *Bergen Electronic Edition* and with the other Wittgenstein databases from InteLex.[4] Besides detailed commentary on every letter elucidating names, places and dates, the edition provides some 300 biographies of persons appearing in it. The commentary also includes a detailed chronology of Wittgenstein's movements and activities throughout his life, as well as indices of the litera-ture and music which are mentioned in the correspondence.

With its mixture of primary texts and multiple levels of linked commen-tary, the *Gesamtbriefwechsel* is an event not only in Wittgenstein scholarship, but also in digital scholarship at large. As discussed below, it can and should provide a model for the presentation and annotation of texts across the humanities.

Five cross-searchable databases of Wittgenstein texts are therefore cur-rently available online: the *Bergen Electronic Edition*; the *Gesamtbriefwechsel*; the *Collected Works*; *Letters, Lectures, Conversations, Memoirs*; and *Tagebücher und Briefe*.[5] At the same time, InteLex has been building out its online *Poiesis* philosophy journals project. At present, over 1000 issues and 100,000 pages of text from 53 journals are in the *Poiesis* database: a search for 'Wittgen-stein' returns almost 7000 paragraphs where the name is present at least once. *Poiesis* has licensed more than 70 journals for the project, which will ultimately contain 100 journals with 10,000 or more issues.

Further, InteLex is digitizing the *Schriftenreihe* from the Austrian Ludwig Wittgenstein Society with the proceedings of the International Wittgenstein Symposium in Kirchberg. The series features original contributions from some of the foremost philosophers of the last quarter century.

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4.  All are cross-searchable on CD or on the web.

5.  There is a small overlap between the *Gesamtbriefwechsel* and the other two databases with letters.

A number of the pieces required for a Wittgenstein research platform are in place. What remains to be done? As regards additional content, a series of new or augmented databases will be added to the existing resources in the next few years. Another Brenner-Archiv project, *Ludwig Wittgenstein: Tagebücher,* will produce a new edition of Wittgenstein's notebooks from 1914–1917, including the coded texts. This new edition of the 1914–1917 notebooks will appear in a database with Wittgenstein's diaries from 1930–1932 und 1936–1937 (which are already available in *Tagebücher und Briefe*) and, it is hoped, with annotated editions of Wittgenstein's other notebooks (some of which remain unpublished).

*Ludwig Wittgenstein Influences* will be edited and introduced by Allan Janik (Brenner-Archiv, Innsbruck) and will include original language texts from figures who (in Wittgenstein's own estimation) influenced him. This database (which may appear in two parts) will have complete texts like the following:

- Arthur Schopenhauer, *Sämtliche Werke* (1814–1854)[6]
- Heinrich Hertz, *Die Prinzipien der Mechanik* (1894)
- Otto Weininger, *Geschlecht und Charakter* (1903)
- Ludwig Boltzmann, *Populäre Schriften* (1905)
- Karl Kraus, *Sprüche und Widersprüche* (1909)
- Oswald Spengler, *Der Untergang des Abendlandes* (1917–1922)
- Piero Sraffa, *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory* (1960)

This database (or a follow-on) might also include texts from Kierkegaard, Boole, Tolstoi, James, Freud and Frazer which Wittgenstein considered important. *Frege* belongs in any list of those whom Wittgenstein considered highly important influences. A database (or databases) will include all of his writings on philosophy and logic in both original and translation.

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6. Includes *Die Welt als Wille und Vorstellung, Die beiden Grundprobleme der Ethik, Parerga und Paralipomena, Über die vierfache Wurzel des Satzes vom zureichenden Grunde* and other texts, edited by Paul Deussen. München, 1911–1923.

A second edition of the *Bergen Electronic Edition* will be issued with corrections and revisions.[7] This second edition should include identification throughout the *Nachlass* of those passages which were selected from it by the editors of Wittgenstein's 'works'.[8]

Other new databases will contain Wittgenstein texts, lectures and conversations which have not yet been digitized, usually owing to rights problems. Unfortunately, many publishers remain hostile to digital publication even for works which they have allowed to go out of print. This is particularly regrettable among university presses whose purpose is said to be the furtherance of scholarship.

As regards the form in which this data is delivered over the internet, it is inevitable that XML will become standard. This will allow greater customization of the data by individual researchers and will allow enhanced use of metadata for classification and searching.[9] Although the process of transition to XML has already been too slow for some, it is probable that we are still some years away from full XML implementation in Wittgenstein research. Existing problems concern infrastructure (chiefly server architecture and data handling), but are being progressively solved. Meanwhile work is ongoing in regard to the translation of data from existing formats into XML.

Funding remains a fundamental difficulty for digital research in the humanities. Especially in Europe, libraries which spend enormous sums for digital resources in the sciences and professions, are reluctant to allocate funds for similar resources in the humanities. Partly this is due to the perception that the humanities 'don't pay'. But partly this is due to divisions within the humanities themselves regarding the desirability and need for digital resources. Time may be the only healer in such matters. But the appearance

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7. An ongoing list of corrections is maintained at the Bergen Wittgenstein Archives website for the *Bergen Electronic Edition*.

8. Catalogues with such identification already exist: Michael Biggs and Alois Pichler, *Wittgenstein: Two Source Catalogues and a Bibliography*, Bergen 1993.

9. See the pilot projects "Using XML to generate research tools for Wittgenstein scholars by collaborative groupwork" (http://wab.aksis.uib.no/wab_sept1914.page, accessed February 1st, 2005) and "Tracing Wittgenstein: Digital Explorations" (http://wittgenstein.philo.at/, accessed February 1st, 2005), including "Wittgenstein MS115 in APE" (http://wab.aksis.uib.no/wab_115ape.page, accessed February 1st, 2005).

of resources like the *Bergen Electronic Edition* of the *Nachlass* and the Innsbruck edition of the *Gesamtbriefwechsel* means that future Wittgenstein research will increasingly take place in an electronic environment.

## 3. Perspectives for the future

Some of the future of digital research may already be seen *in nuce* in a database like Wittgenstein's *Gesamtbriefwechsel*, where original language primary texts are annotated in layers of commentary. To take a particular example, the database includes a letter Wittgenstein wrote Keynes from Puchberg on July 4, 1924. He thanks Keynes for some books which Keynes had sent with a letter on March 29 that year. Links have been installed between these letters so that the preceding context of Wittgenstein's letter is immediately available. Wittgenstein's usual greeting to 'Johnson' in his letters to Keynes is linked to a note identifying this as William Johnson. This annotation, in turn, is linked to a short biography of Johnson. Puchberg is described in the *Ortsverzeichnis* of the database and Wittgenstein's stay there is located in the *Chronik*. The book of Keynes which Wittgenstein discusses in his letter (*The Economic Consequences of the Peace, 1919*) is described in the *Erwähnte Literatur* section. Navigation between these sections of the database is intuitive and may usually be made via single-click jumplinks.

It is predictable that these same principles will be applied in a comprehensive way to the other Wittgenstein resources which are already in electronic form. The effect will be to create a sort of second stage to the research platform concept discussed above. The first stage converts texts available in print and/or microfilm to electronic form, aggregates them and supplies powerful search tools: the resulting database allows new access to these previously edited texts through user-specified searches. As illustrated in the last decade of humanities research, this in itself does not, however, bring startling changes to the established patterns of humanities scholarship.

The second stage adds electronic editing, which will often, or perhaps always, be accomplished through a networked group of researchers (as was the case with the *Gesamtbriefwechsel*). This seemingly small step to electronic editing entails a series of important changes for research in the humanities and, perhaps, a further highly important step regarding the relationship between such scholarship and the larger society around it.

The first change which results within scholarship is to change the form of scholarly contributions. Where contributions in a print environment are usually formulated in lectures and then in journal articles (which may then be further developed into books), contributions in an electronic environment may be made in a much more concise and focused way linked (in the case of Wittgenstein research) to a specific passage (or passages) in the Wittgensteinian corpus. The result is to de-emphasize the sort of literary exposition which is required in lectures and articles and to emphasize instead the formulation of discrete points in specific relationship to a particular passage or passages in the primary texts.

In this way, electronic editing has the effect of building expert knowledge into the presentation of texts. This will obviate the need for much of the sort of research which was required with print texts. Scholarship in a print context is related to such questions as: Where are the relevant texts to be found? When can these texts be dated? How do these texts interrelate? What special knowledge and special skills are needed to interpret them? How can the results of such research be formulated in articles and books? In an electronic environment, many of these questions are answered on, so to say, the very surface of the subject. All of the texts are already there. All of the intertextual references are already identified and set out with jumplinks. A great deal of the special knowledge needed for interpretation is available with a single mouse-click. Time and energy do not have to be spent getting to know the places where Wittgenstein discussed such and such a topic – anyone can compile such contexts in seconds through electronic searches.

In turn, this change in form will effect a corresponding change in the focus of research. In a print world, scholars are explorers mapping a mostly unknown continent and contributions are judged in terms of the number of new landmarks they are able to situate, the detail they are able to bring to unexplored regions, the corrections they are able to make to other maps, etc. To a greater or lesser extent, everybody produces a map of their own. In the digital dispensation, by contrast, scholars will be contributing to a shared map where original exploration is not by any means excluded (as will be taken up below), but the emphasis lies in the explication of particular textual points (which can, of course, occur in a great variety of different ways).

In a print world, information is arrayed in serial order along a continuum stretching from those who know nothing about it to those to know all there

is presently to know about it. The continuum is marked along its way by different sorts of resources and different goals from beginning instruction to leading-edge research. In a digital world, all of the information and resources relating to the field are already present for everyone. What differentiates the beginner from the expert is the way he or she is exposed to the total information mass. The role of the specialist ceases to be that of exploring distant realms and reporting the information back to those who have not made the journey, but of participating in the on-going *indexing* of the knowledge base to facilitate research, teaching and practical application. Here, too, the global village replaces what were formerly isolated states. Although, indeed *because*, this trend has had extremely negative effects on the physical environment and on languages and cultures around the world, in humanities scholarship it might and should have the contrary effect of introducing consideration and analysis to what has been reflex action.

The consequence is to shift the activity of humanities research in the direction of current scientific research. Being a chemist means knowing how to participate in the further investigation, or applied use, or teaching, of existing chemical knowledge. It is foreseeable that research in (say) Wittgenstein will come in comparable fashion to be defined by a knowledge of its present state (including open questions in the field) as represented in a complex digital desktop. In both cases, a rough map of accepted results and known uncertain areas serves to define the field.

The progress of events will probably be something like the following: A networked group of Wittgenstein researchers will undertake to edit and annotate the entire corpus (doubtless beginning with specific texts or topics and building out from there). Text passages of various lengths (word, phrase, sentence, paragraph, etc.) will be fitted with different icons leading to annotations regarding (say) the chronology of the passage, related texts, the place of the passage in different areas of Wittgenstein's concerns (logic, values, language use, etc.), the centrality of the passage to his overall enterprise, etc. Decisions regarding these notes will be made according to some agreed procedure and users will have the ability to turn on or off any set of annotations. Differing readings and opinions can be accommodated through further annotations to the text or through annotations to the annotations. Since the cost of digital storage is disappearingly small, there is no limit to the amount of annotation and disagreement which might be recorded, but

ongoing considerations would of course have to be given to the best way or ways to organize the growing mass of materials. This sort of meta-consideration will, indeed, be one of the single most important questions for research in the field (just as it is in the sciences) – especially since both the content and form of the texts left by Wittgenstein may be taken to contribute to the debate around it.

As illustrated by Google, 'organization' in this sense is just 'indexing'. The goal is to organize or index materials in such a way that as much information as possible is present, but present in such a way that it is useful for on-going research, for practical application and for instruction. 'Useful' in this context means something like: organized in a coherent manner, but open to modification in ways which are neither merely willful nor subject to unreasonable (authoritarian, bureaucratic, connection-dependent, etc.) barriers. Such balance doubtless entails much on-going work of attention and adjustment.

Perhaps successful indexing of this sort is exactly what enables the transition from pre-scientific speculation to scientific inquiry. The latter requires clarity in regard to (a) the existing state of a field of knowledge, (b) the open questions implicated in it, (c) the ways in which those questions might be addressed, (d) the ways in which answers to such questions can be then fed back into (a) with corresponding changes in (b) and (c). Scientific inquiry is this circling movement. Dynamic indexing is exactly what enables such clarity and, therefore, the properly scientific inquiry which can result from it.

It is possible that the difference between the hard and soft sciences or between the sciences and the humanities is not that they concern fundamentally different sorts of objects or involve fundamentally different sorts on inquiry, but that the latter are simply more difficult to index. The new possibilities for indexing offered by digital technology may be able to solve this problem and therefore institute a qualitatively different sort of inquiry within the humanities from what has characterized them in the past.

Digital indexing will allow individual researchers to create their own desktop with their own editions of texts and their own sets of annotations (just as a chemist is free to set up her lab in any way she wants). But there will be a standard notion of Wittgenstein research through the on-going work of indexing and maintenance of the resources associated with the field.

How participation in such indexing and maintenance is decided is an important question requiring research of its own. This is a contested question in the sciences, however, and will not serve to differentiate research in the humanities from them. On the contrary, such consideration will be one more way in which the two will tend to coalesce. In both, a rough consensus will be agreed around certain central points, but different schools and individual theories will exist at the margins of research and it is at these margins that new work is concentrated. It will therefore be important to consider how such margins are best to be identified and investigated.

These changes flowing from research in a digital environment will allow, indeed enforce, a new precision in the field. This new precision, in turn, will allow the application of insights from the humanities to problems and policy decisions in society at large – an innovation which should prove as salutary for the isolation of the humanities as for the enormous needs of society. Questions will cease to arise exclusively within the discipline and will instead begin to be addressed (in both directions) between it and the surrounding world.

In this environment, a company like InteLex will continue to aggregate content and to make it available to researchers online. But networked tools for new content creation and for annotation of existing content will become increasingly important. Close cooperation with scholars will be imperative for the design and maintenance of these tools and of the network in which they function. The renewed integration of the humanities in culture and society, an integration essential to both sides, may well begin at this level. In all of this, Wittgenstein scholarship should play an exemplary role for future research in the humanities generally.