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New Testament Textual Criticism and Digital Humanities

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Abstract

The relationship between New Testament textual criticism (NTTC) and digital humanities (DH) is a successful one, as demonstrated by the analysis of five ERC grants in NTTC and DH, awarded in the last decade. Along with other features of the field, these projects highlight the fast evolution of digital editing of the NT and multilingualism, and the importance of domain centered research infrastructures. One DH approach has yet to be explored in NTTC: the automated recognition of handwritten characters. This chapter demonstrates that NTTC is boosting New Testament studies with access to new, digitized research material, while remaining grounded in a well-established tradition of close reading. It takes advantage of digital methodologies while honoring humanities core-skills.

Keywords: textual criticism, digital humanities, ERC grants, digital editing, multilingualism, research infrastructures, disciplines, OCR/HTR, artificial intelligence.

1. Introduction¹

As with all the other fields of the humanities, New Testament textual criticism (NTTC) has progressively integrated computing culture into its daily work. This new relationship is, without a doubt, a successful one, as Section 2 argues by observing five awarded NTTC European Research Council grants in the last decade.² They are all projects focused on bringing together New Testament manuscripts and the digital humanities (DH).³ From these examples, one can recognize some developmental milestones of NTTC and DH that correspond with other fields in the humanities that have all cultivated a digital culture over the last decade.

In this quickly growing DH landscape, NTTC is fostering domain-centered research infrastructures (RIs), like the *New Testament Virtual Manuscript Room* (NTVMR) maintained by the *Institut für Neutestamentliche Textforschung* in Münster.⁴ The NTVMR was created during a period when the social sciences and humanities were invited to partner with other domain programs, beginning with the framework program for research and innovation, Horizon 2020.⁵ Time will tell how the interaction between generic and domain centered RIs will evolve. In the meantime, it is therefore necessary and fruitful to analyze the role of domain centered

¹ The author would like to thank Andrea Stevens for proof-reading this chapter; its writing has been supported by the SNSF project MARK16 179755.

² For a description of the ERC starting, consolidator, and advanced grants, see <https://erc.europa.eu/funding>.

³ In chronological order: Houghton, *COMPAUL*; Wallraff, *PARATEXBIB*; Houghton, *CATENA*; Allen, *TiNT*; Kreinecker, *BICROSS*. All levels are represented with two starting grants, two consolidator grants, and one advanced grant.

⁴ INTF, *New Testament Virtual Manuscript Room*, <https://ntvmr.uni-muenster.de>. For a description and discussion of the NTVMR, see Hüffmeier and Paulson, "Editions of the Greek New Testament from the 20th Century," XX (ch. 38); and Houghton, "The Practice of New Testament Textual Criticism in the Twenty-First Century," XX (ch. 23) in this volume.

⁵ Duşa et al., "Agenda", 225.

RIs and Virtual Research Environments (VREs)⁶ in fundamental NTTC research, as illustrated by these five European Research Council projects (Section 2). Section 3 will further explore some main topics highlighted in the projects overview: digital editing, multilingualism, domain centered RIs and VREs, as well as an important missing point, the automated recognition of handwritten characters. This inquiry shows that NTTC is boosting NT studies with access to new digitized research material, while remaining grounded in a well-established tradition of close reading. It demonstrates how a field of humanities can take the best from the DH world and give tribute to its core skills.

2. A Successful Story: Five Important Grants in the Last Ten Years

2.1 Why is It Worth Observing the Evolution of the Field through the ERC Grants?

The European CORDIS database⁷ displays five ERC starting, consolidator, or advanced grants focused on New Testament manuscripts and DH. All these grants have been obtained in the last decade (calls 2011–2021) and, in this connection, it is worth noting that the European Research Council itself was set up in 2007. NTTC is clearly the most represented sub-field of New Testament studies among the ERC grants. Before presenting the projects, it is necessary to explain why this fact is significant in demonstrating a successful link between NTTC and the DH. Each of these prestigious five-year awards recognizes the achievement of an individual scholar, but they are also representative of the most leading trends in a specific field and in the humanities for two main reasons. First, the projects are developed by esteemed scholars within the field, but they are also reviewed by panel members who belong to fields across the humanities.⁸ This means that the project is also recognized as pertinent from a general humanities point of view. Secondly, the significant financial amount of these grants—between 1.5 and 2.5 million euros—allows the grantee to enroll several collaborators who bring new material and discoveries which add value for all those in the field. Without a doubt, these five ERC grants over the last ten years have had or will have a strong effect on research, and this highlights NTTC as a trending field of New Testament studies.

These two assertions are supported by the timeframe of the last decade of DH. As discussed elsewhere,⁹ the term “digital humanities” was coined in the early years of this century and has fostered a transformation that one could barely have imagined.¹⁰ A regular monitoring of the evolution of the DH can, for example, be read about in the series *Debates in Digital Humanities*, beginning in 2012.¹¹ In the framework of this chapter, I will point out one of the main features that affects the humanities going digital in the last decade. The humanities, along with the social sciences, has been strongly advised to join with the other sciences in their transition towards

⁶ For a definition and thoughts about VREs in Humanities and NTTC, see Clivaz, “Impact,” 1–12. “RIs” designates infrastructures of interest for the entire field which are undergoing continuous development, whereas “VREs” designates products related to a specific project in a determined timeframe.

⁷ CORDIS is a “structured public repository with all project information held by the European Commission such as project factsheets, participants, reports, deliverables and links to open-access publications”, <https://cordis.europa.eu/about/en>.

⁸ See here an example of an ERC panel members list, published some months after the attribution of the grants: <https://erc.europa.eu/content/panel-members-erc-advanced-grant-2021>.

⁹ Clivaz, *Écritures digitales*, 48–60.

¹⁰ Clivaz, *Écritures digitales*, 83: “Discussed in print for the first time in an article published in 2004 (though already present at a 2002 online conference), and analyzed endlessly in meetings and conferences, the label ‘digital humanities’, or DH, has been rapidly associated with academic positions, degrees, centers, laboratories and research projects.” For a detailed account, see Kirschenbaum, “What Is Digital Humanities,” 55–61.

¹¹ *Debates*.

open science through research infrastructures (RIs). In the 2014 collected essays *Facing the Future*, Adrian Duşa, Claudia Oellers, and Simon Wolff described this move:

Research in the social sciences and the humanities (SSH) in Europe is currently facing a historical turning point. The social sciences and the humanities have been included in the European Union's new framework program for research and innovation Horizon 2020 and embedded across the societal challenges the program seeks to address. The integration of both disciplines is a sign for the increasing recognition and the essential role SSH plays in addressing the societal challenges and the great number of pressing issues Europe faces today and in the near future.¹²

This statement shows that the SSH has been invited to join other European research projects and infrastructures at the exact same time as the three main SSH European Research Infrastructures Consortium members¹³ were created: CLARIN (2012), DARIAH (2014), and CESSDA (2015).¹⁴ In very recent years, together with other stakeholders,¹⁵ they have reinforced their common work in the consortium known as SSHOC, the *Social Sciences and Humanities Open Cloud*.¹⁶ This helps make their SSH identity visible through open calls that encourage “cross-disciplinary” approaches.¹⁷ Moreover, the new European research program, Horizon Europe, is structured around five areas of interest or missions going beyond disciplinary boundaries, all focused either on climate challenges or cancer research.¹⁸ In this context, it seems particularly important to draw attention to the common efforts of the social sciences and the humanities to highlight their significant role in knowledge and the sciences, as demonstrated in the *SSHOC Legacy Booklet*, published in March 2022.¹⁹

In this evolving landscape, I would like to argue that fundamental research in the humanities—in this case, in NTTC—has a primary role to play in supporting the visibility and impact of SSH in European and international research. This statement will be illustrated by the analysis of the effects of five grants focusing on NTTC and DH. They have been submitted over the last decade and are also crucial for the general development of DH in the wider fields of biblical studies and theology.²⁰ Let us now see what these projects reveal about the evolution of NTTC and its capacity to integrate the DH.

2.2 Overview and Main Outcomes of Five ERC Grants in NTTC

¹² Duşa et al., “Agenda,” 225.

¹³ See the ERIC official definition: “The European Research Infrastructure Consortium (ERIC) is a specific legal form that facilitates the establishment and operation of Research Infrastructures with European interest,” https://research-and-innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/european-research-infrastructures/eric_en.

¹⁴ CLARIN, <https://www.clarin.eu>; CESSDA, <https://www.cessda.eu>; DARIAH, <https://www.dariah.eu>.

¹⁵ OPERAS, <https://www.operas-eu.org>; IPERION-HS, <https://www.iperionhs.eu>; ESS, <https://www.europeansocialsurvey.org>; SHARE, <http://www.share-project.org>.

¹⁶ SSHOC, <https://sshopencloud.eu>.

¹⁷ See for example: <https://sshopencloud.eu/news/rda-cross-disciplinary-science-adoption-grants-2>.

¹⁸ https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe_en.

¹⁹ SSHOC, *Legacy*, <https://zenodo.org/record/6394462>.

²⁰ To the steps up to 2017 listed in Clivaz, “Bible,” 21–22, one can now add the opening of the first German DH center in theology, the *TheoLab-Forschungsverbund Digitale Theologie*, at the University of Heidelberg (<https://www.uni-heidelberg.de/fakultaeten/theologie/forschung/theolab.html>); the first Swiss DH theological center at the Faculty of Theology of the University of Zürich, *UFSP Digital Religion(s)* (<https://www.digitalreligions.uzh.ch/de.html>); and numerous monographs and collected essays, e.g., Philipps, *Bible*; Clivaz, *Ecritures digitales*; Al-Suadi and Ulshöfer, *Biblical Texts*; Uhlshöfer et al., *Digitalisierung*; Hutchings and Clivaz, *Digital Humanities*.

2.2.1 COMPAUL, H. A. G. Houghton (2011–2016)

COMPAUL, *The Earliest Commentaries on Paul as Sources for the Biblical Text* (ERC-STG 2011 call) was awarded to H. A. G. Houghton from the University of Birmingham (UK).²¹

The COMPAUL project investigated the earliest commentaries on the Pauline Epistles as sources for the biblical text. The focus was on Latin writers of the fourth and fifth century (Marius Victorinus, Ambrosiaster, Jerome, Augustine, Rufinus and Pelagius) and the earliest Greek commentators (Origen, John Chrysostom, Theodoret). The project showed that these commentaries preserve forms of text which are no longer found in New Testament manuscripts, making them important witnesses to readings which have otherwise been lost. The same is true of the earliest Latin commentary on the Gospels, by the fourth-century bishop Fortunatianus of Aquileia: the rediscovery of this work in 2012 allowed the project to extend its scope in order to advance knowledge of a previously unknown commentary.²²

One can hardly overemphasize the added value of COMPAUL with its list of thirty-one publications.²³ The results have made it clear that ancient writers had access to manuscript versions which are lost today, or considered as very specific cases, identifying, notably, twenty-nine new readings which differ from the Vulgate in Jerome's *Commentary on Galatians*.²⁴ COMPAUL helps in the understanding of why digital editing of the NT is currently at a turning-point, as discussed below in Section 3.1. Moreover, the project has largely contributed to the entire field of NTTC and demonstrated how an ERC grant can bring strength and innovation beyond the members of the team—like ripples on the water—in this case promoting current work on the edition of the Pauline letters in the *Novum Testamentum Graecum Editio Critica Maior* (ECM) by the *International Greek New Testament Project* (IGNTP). This is led by Houghton as the Executive Editor in collaboration with other international teams of with responsibility for books.

The Executive Editor of Paul is Prof. Hugh Houghton. Several teams are led by co-editors, with responsibility for particular books: Dr. Andrew Smith (the Pastoral Epistles), Prof. Ekaterini Tsalampouni (the Epistles to the Thessalonians), Prof. Martin Karrer (Hebrews), Prof. Curt Niccum (Colossians), Prof. Christina Kreinecker (1 Corinthians).²⁵

For this long-term collaborative editing project, COMPAUL has provided the transcription of several Latin manuscripts of Romans, 1 and 2 Corinthians, and Galatians, available online at a webpage devoted to “work towards new editions of the Epistles of Paul in Latin and Greek.”²⁶ The website hosts numerous transcriptions of Greek and Latin manuscripts of Pauline letters

²¹ Project description: <https://cordis.europa.eu/project/id/283302>.

²² <https://cordis.europa.eu/project/id/283302/reporting>. The Latin text of Fortunatianus was rediscovered and then edited in 2017 by Lukas J. Dorfbauer (Dorfbauer, *Fortunatianus Aquileiensis*), and translated with an English introduction by Houghton the same year (Houghton and Dorfbauer, *Fortunatianus of Aquileia*).

²³ See <https://birmingham.ac.uk/compaul>.

²⁴ Houghton, “Biblical,” 1–24. See on Cordis: “Two results of the application of this method stand out: the project identified 29 new readings in Jerome's Commentary on Galatians which differ from the standard later text, known as the Vulgate, and are more likely to have been in Jerome's original”, <https://cordis.europa.eu/project/id/283302/reporting>.

²⁵ <http://www.igntp.org/projects.html>.

²⁶ <http://www.epistulae.org>.

and is one of the milestones of the larger IGntp which will produce critical editions of a number of New Testament books in the ECM series.²⁷ Moreover, a very useful digital database of quotations has been produced by COMPAUL, which contains:

99,790 full-text quotations of Romans, 1 Corinthians and Galatians in Latin authors up to the eighth century, prepared in conjunction with the *Vetus Latina Database*, and 38,150 full-text Greek quotations of the Pauline Epistles, prepared in conjunction with Biblindex.²⁸

Thus, the DH project, COMPAUL, has been successful in leading individual scholars to work decisively in teams, providing transcriptions encoded in TEI/XML, and making data and publications available in open access. The IGntp committee took a decisive step along the way to update the Creative Commons license of the IGntp material (including the output of COMPAUL) to a CC BY 4.0 license, allowing commercial reuse of the transcriptions.²⁹ At the same time, as one can read online, the short summary of the project did not mention digital tools, purposes, or methodologies at all.³⁰ The digital products have nevertheless been crucial results in the project along with the publications. At that time, the ERC was still not advising the grantees to have a data management plan, but COMPAUL has nevertheless secured open access of its data thanks to the University of Birmingham open public repositories.

2.2.2 PARATEXBIB, Martin Wallraff (2014–2019)

PARATEXTBIB, *Paratexts of the Bible: Analysis and Edition of the Greek Textual Transmission* (ERC-ADG 2013 call) was awarded to a scholar in Ancient History, Martin G. Wallraff at the University of Basel (CH), subsequently transferred to the University of München (DE).³¹ It had a decisive influence of the field of NTTC, specifically in regard to its content and innovative collaboration with the NTVMR, as we will discuss. The main objective of the project was to consider biblical manuscripts as textual objects embedded in the history of reading:

[W]hile biblical manuscripts have so far been largely analysed as witnesses to an original text (“Urtext”), this project approaches each manuscript as a single witness to an act of reading and re-interpreting the text. In recent literary theory, attention has been drawn to ‘paratexts’, i.e. all material accompanying a main text.³²

Even if such assumptions are already reflected in COMPAUL, as well as more generally in the field, to have an ERC grant focused on the materiality and paratextuality of New Testament manuscript has brought the topic to the forefront of the field, inspiring further work.³³ The description of project points to a neglect of the paratexts in traditional biblical studies,

²⁷ IGntp, <http://www.igntp.org>.

²⁸ <https://itsee-wce.birmingham.ac.uk/citations/search>; <http://www.biblindex.org>.

²⁹ Houghton, “Electronic,” 147: “Following the original presentation of this chapter, a proposal was tabled that the IGntp and other creators of electronic transcriptions should follow INTF’s lead of removing the non-commercial stipulation from their licenses and also dispense with the share-alike requirement, in order to allow for the widest possible re-use of this data. This was unanimously approved by the IGntp committee in November 2017 and applied retrospectively with the release of 350 New Testament transcriptions under a Creative Commons 4.0 Attribution license.”

³⁰ Project description: <https://cordis.europa.eu/project/id/283302>.

³¹ Project description: <https://cordis.europa.eu/project/id/339256>.

³² Project description: <https://cordis.europa.eu/project/id/339256>.

³³ See for example Allen and Royle, “Paratexts,” 1–25.

concerning an “inspired text.”³⁴ The PARATEXBIB, on the other hand, focuses on each manuscript as “primarily a witness to itself,”³⁵ and therefore developed a partnership with the *Institut für Neutestamentliche Textforschung* (INTF) to allow integration with the NTVMR that presents almost all images of the available Greek manuscripts of the NT.

First, the PARATEXBIB team has directly inserted comments and remarks in the NTVMR, adding its presence and knowledge in this tool commonly used in NTTC scholarship. Secondly, PARATEXBIB has created its own database with paratexts transcribed, that provides a hyperlink for each manuscript leading directly to the images in the NTVMR.³⁶ Conversely, a similar service is provided by the NTVMR that indicates the content for each manuscript in the PARATEXBIB database.³⁷ One cannot underestimate the added value of PARATEXBIB in regard to the systematic presentation of the paratextual material in 1,500 Greek manuscripts (out of ca. 2,400 extant items) and the new way of collaboration developed between scholars of NTTC and ancient historians around the NTVMR.³⁸

Regarding the impact of the DH, it is interesting to note that the project originally announced that “final results . . . will be published as a monograph.”³⁹ However, the online database with the raw data now appears to be the primary achievement, although complementary printed volumes in the de Gruyter series *Manuscripta Biblica* have been announced, but not yet published.⁴⁰ It is worth considering this switch at length: all humanist scholars who are producing their results in the form of a VRE are facing similar challenges. VREs are demanding in terms of time, resources, and energy. When mentioned in the grant, they are often still considered as “nice to have,” as additional points, whereas in the actual implementation of a project, the VREs turn out to be of crucial importance to publishing research results. There is probably no perfect solution to this DH aporia, apart from testing new ways of validation, e.g., with a peer-review process and ISSN attributed to VREs,⁴¹ and stimulating new formats of digital books,⁴² while still encouraging the effort of writing long texts as fundamental to the core skills within the humanities.⁴³

As a final remark, one can wonder if the visibility of PARATEXBIB could have been stronger during the years of the grant through the regular publication of open research data. DH projects funded by National Agencies are often prioritizing the communication of “the finished product,” whereas sharing data along the way allows for feedback from other scholars to shape and improve the project as it is being formed.

2.2.3 CATENA, H. A. G. Houghton (2018–2023)

³⁴ Project description, <https://cordis.europa.eu/project/id/339256>: “However, these paratexts have been neglected by scholars for two reasons: firstly, because biblical studies traditionally concentrate on the ‘inspired text’ itself; secondly because of the sheer amount of available material, which far exceeds the capacities of a single scholar.”

³⁵ <https://cordis.europa.eu/project/id/339256/reporting>.

³⁶ See this example for GA 044: <https://www.manuscripta-biblica.org/manuscript/?diktyon=27104>.

³⁷ See this example for GA 044: <https://ntvmr.uni-muenster.de/liste?docID=20044>.

³⁸ <https://cordis.europa.eu/project/id/339256/reporting>.

³⁹ <https://cordis.europa.eu/project/id/339256>.

⁴⁰ Publications of PARATEXBIB in CORDIS: <https://cordis.europa.eu/project/id/339256/results>.

⁴¹ See the ISSN attributed to the SNSF project MARK 16 by the National Swiss Library: ISSN 2673-9836, available in the Helveticat online catalogue: <http://permalink.sn.ch/bib/sz991018147829403976>.

⁴² See for example the Brill scholarly editions, <https://scholarlyeditions.brill.com>, and the Brill online space for publishing open research data, <https://brill.figshare.com>.

⁴³ Antoine Fauchié was one of the first scholars to think about the evolution of the monograph format in “webbooks” in 2016 (Fauchié, “Le livre web”, <https://www.quaternum.net//2016/10/24/le-livre-web-une-autre-forme-du-livre-numerique/>).

CATENA, *Commentary Manuscripts in the History and Transmission of the Greek New Testament* (ERC-COG 2017 call), was awarded to H. A. G. Houghton from the University of Birmingham (UK).⁴⁴ This project was inspired by COMPAUL and its initial catalogue of catena manuscripts published in 2016.⁴⁵ Moreover, it overlapped with a previous UK Arts and Humanities Research Council grant on Codex Zacynthius.⁴⁶ Dated around 700 CE and containing the Gospel of Luke, this palimpsest is the most ancient catena manuscript of the NT.⁴⁷ H.A.G. Houghton and David C. Parker, in collaboration with Panagiotis Manafis, Amy C. Myshrall, and Catherine Smith, have edited the complete Codex Zacynthius on the basis of new multi-spectral images.⁴⁸ Certain folios can present different textual versions on the same page. In his 1861-edition, Samuel Prideaux Tregelles had chosen to transcribe only the central biblical text without paying attention to the accompanying commentary.⁴⁹ In the 2020-edition of the complete codex Zacynthius, the readers again face this intriguing fact also highlighted by COMPAUL: there are textual versions or variants of the biblical text still to be discovered.

Based on the COMPAUL, CATENA could further affirm that a lot of material is still to be discovered—as many as one hundred new catenae manuscripts were discovered during the course of the project.⁵⁰ This impressive number represents patient teamwork.⁵¹ Publications from this ongoing project have already been announced;⁵² the first datasets are available online, notably “a full checklist of 646 New Testament catena manuscripts,”⁵³ and a “searchable online database with 688 Greek New Testament catena manuscripts.”⁵⁴ Moreover, Georgi Parpulov’s catalogue of these manuscripts has been published as a monograph in Open Access.⁵⁵ In the project description, one can see a clear affirmation of the use of digital tools and methodologies, whereas this was not the case in the COMPAUL and PARATEXBIB descriptions:

The CATENA Project will use digital tools to undertake a fuller examination of Greek New Testament commentary manuscripts than has ever before been possible. This will include an exhaustive survey to establish a complete list of witnesses; a database of extracts to examine their principles of organisation and relationships; and electronic transcriptions to determine their role in the transmission of the biblical text.⁵⁶

⁴⁴ Project description: <https://cordis.europa.eu/project/id/770816>.

⁴⁵ Houghton and Parker, “Introduction.”

⁴⁶ Parker with Houghton, <https://www.birmingham.ac.uk/research/itsee/projects/codex-zacynthius.aspx>.

⁴⁷ Parker, “Zacynthius,” 113–119.

⁴⁸ Houghton and Parker, *Codex Zacynthius*; Houghton et al., *Palimpsest*.

⁴⁹ Tregelles, *Codex Zacynthius*.

⁵⁰ Project description, <https://cordis.europa.eu/project/id/770816>: “The number of known copies has increased by 20% following a preliminary survey last year which identified 100 additional manuscripts. A recent comprehensive textual analysis of the Catholic Epistles indicated that all witnesses from the third generation onwards (some 72% of the total) could stem from the biblical text of three commentary manuscripts occupying a key place in the textual tradition. Investigation of the catena on Mark has shown that the selection of extracts could offer a new approach to understanding the theology of the compilers and the transmission of the commentaries.”

⁵¹ See the details of the intermediate report here: <https://cordis.europa.eu/project/id/770816/reporting>.

⁵² <https://cordis.europa.eu/project/id/770816/results>. See also <https://birmingham.ac.uk/catena> or <https://www.birmingham.ac.uk/research/itsee/projects/catena/publications.aspx>.

⁵³ <http://epapers.bham.ac.uk/3086/>.

⁵⁴ <https://itsee-wce.birmingham.ac.uk/catenacatalogue/>.

⁵⁵ https://research.birmingham.ac.uk/portal/files/132638459/2021_Parpulov_Catalogue.pdf.

⁵⁶ Project description, <https://cordis.europa.eu/project/id/770816>.

Houghton noted in a 2019-article that the average transcription of words, according to the IGNTP standards, is of 600 words per hour.⁵⁷ The collection of data in Birmingham over the last several years is done with “the widely-adopted *Collate program* and its successors,” which is used to collate the electronic transcriptions of all included manuscript witnesses, and then to create a critical apparatus, which “is compiled automatically from these files, using an algorithm to improve alignment, and creating meta-files to assist with the normalization of the data.”⁵⁸ Here, we touch on a crucial point—the reading and transcription of the manuscripts themselves remains the prerogative of human eyes, whereas computing approaches can be applied to subsequent tasks. Section 3.3 will further discuss this observation. So far, this overview demonstrates that NTTC and the DH ERC grants have been a notable success because they make new material available for research. This is also the case in the fourth example, TiNT.

2.2.4 TiNT, Garrick Allen (2020–2025)

TiNT, *Titles of the New Testament: A New Approach to Manuscripts and the History of Interpretation* (ERC-STG 2019 call), was awarded to Garrick Allen, at Dublin City University (IE), subsequently transferred to the University of Glasgow (UK).⁵⁹ As surprising as it is, no systematic study of the titles of the NT has been done until now. TiNT inquiries about:

...what manuscripts say about the ways the NT was interpreted by the communities that produced them. Researchers will analyse the forms and wordings of the title preserved in all non-lectionary NT manuscripts (c. 3500). The project will also take each manuscript seriously as evidence for specific reading events, using titles as primary evidence. Titular analysis informs a range of topics, including authorship, locales of production, contexts of use, bibliography and literary interpretation.⁶⁰

Even though it is quite early to overview the project results, a list of publications shows what has been achieved so far,⁶¹ integrating the findings of a previous small-grant project about GA 2604 funded by Templeton.⁶² In addition, Allen has accounted for some research results in a 2022-article presenting an exemplary overview of the inscriptions, subscriptions, and *kephalaia* that appear in New Testament papyri.⁶³ The wealth of information compiled by teamwork, as is the case in the previous examples of ERC projects, is impressive and opens up a series of new questions: How does material codicology influence New Testament writings’ titles? How can we interpret these early results from material that has merely escaped destruction by pure luck?⁶⁴ When new material is collected, new research questions arise, and this demonstrates that TiNT is already making strides barely two years into the project. Moreover, as pointed out by Allen himself, the impact of the digital culture clearly matters in his research:

In the digital realm, the critical edition is becoming a resource that is potentially more powerful in its multimodality because images, transcriptions and other metadata can contextualise the textual choices of editors encoded in printed editions. The mass digitization of manuscripts and the development of collaborative editorial platforms like the New Testament Virtual Manuscript Room have created a situation where we can

⁵⁷ Houghton, “Electronic,” 139, footnote 26.

⁵⁸ Houghton, “Electronic,” 133. For the *Collate* software developed by Peter Robinson, see Robinson, *Collate*.

⁵⁹ Project description: <https://cordis.europa.eu/project/id/847428>.

⁶⁰ Project description: <https://cordis.europa.eu/project/id/847428>.

⁶¹ See <https://kephalaia.com/publications/>; <https://cordis.europa.eu/project/id/847428/results>.

⁶² Allen, “Possibilities,” 409–434; Allen and Royle, “Paratexts.”

⁶³ Allen, “Titles,” 156–171.

⁶⁴ See the wise remarks of Stoekl, “De l’arbre,” 169–188.

now turn our editorial attention to the liminal but omnipresent features of the tradition to locate the past 300 years of textual scholarship within the material spaces from which these texts were initially abstracted. Features like the titles are one vector for considering the future of the critical edition, the critical value of paratexts for interpretation and reception, and the many anonymous people who read, annotated, and copied sacred traditions from the second century onward.⁶⁵

TiNT also has specific purposes within DH as apparent from a recent article.⁶⁶ Like PARATEXBIB, the project has established a regular collaboration with the INTF to integrate data in the NTVMR and has started a collaboration with the ADAPT Centre (Ireland) for the upcoming digital part of the project. Inspired by the example of the Irish VRE CULTURA,⁶⁷ TiNT aims to add “new layers of annotation” on the images provided in the NTVMR, the common workplace for the field.⁶⁸ The article also shares a mockup of the potential interface.⁶⁹ It is noteworthy that TiNT is the first ERC project among our examples to announce the plan to create a proper digital tool, going beyond databases. It will be interesting to follow the development of this part of the project. In my opinion, it should become common practice for a project in DH to share mockups and “big digital dreams” at the start of the project in order to receive feedback and manage the inevitable gap between the dreamed project and its realization. Humanist scholars are learning day by day how to run a digital project, integrating new languages such as GitHub and encoding, and working in interdisciplinary teams. These ERC projects illustrate the tenacity required by humanist scholars to transform their visions in digital realities.

2.2.5 BICROSS, Christina Kreinecker (2022–2027)

BICROSS, *The Significance of Bilingual Manuscripts for Detecting Cross-Language Interaction in the New Testament Tradition* (ERC-COG 2021 call), was awarded to Christina Kreinecker from the University of Leuven (BE).⁷⁰ In 2021, she had already received a Research Foundation Flanders Odysseus (FWO) grant, *1Cor – Text, Transmission and Translation of 1 Corinthians in the First Millennium*, a project focused on editing 1 Corinthians for the ECM on a multilingual basis.⁷¹ In the description of the ERC-COG BICROSS on Cordis, one can observe that it will further develop this multilingual approach, described as follows:

BICROSS is an interdisciplinary project linking Greek, Latin, Syriac, Coptic, Gothic, Armenian and Arabic philology, New Testament textual criticism, manuscript studies, ancient history, and digital humanities. Little is known about the bilingual New Testament manuscripts, although translations occur remarkably early. . . . For centuries New Testament manuscripts have been studied from a monolingual perspective which has obscured the fact that the textual transmission did not take place solely within the boundaries of a single-language tradition but also across languages. Uncovering and establishing the mutual exchange and cross-language interaction require a new

⁶⁵ Allen, “Titles,” 171.

⁶⁶ Allen, et al., “The New Testament,” <https://classics-at.chs.harvard.edu/classics18-allen-conlan-conrandedebryne-griffitts-jain-nicholson-osullivan-rodenbiker-royle-schmid/>.

⁶⁷ Hampson et al. 2012. Website of the project: <http://www.cultura-strep.eu/>.

⁶⁸ Allen et al., “The New Testament,”: “As part of the TiNT project, the ADAPT Centre has been tasked with enhancing the NTVMR editorial tool to better enable archivists’ enrichment of digitalized manuscripts specifically required for this project.”

⁶⁹ Allen et al., “The New Testament.”

⁷⁰ Project description: <https://cordis.europa.eu/project/id/101043730>.

⁷¹ <https://theo.kuleuven.be/en/odysseus-kreinecker>.

multilingual approach to the New Testament tradition. . . . Accepting the possibility that each variant reading could have had its potential source in a reading from a different language tradition and may likewise have caused a dependent reading in any of the other language traditions breaks new ground.⁷²

This account of multilingual material highlights an important trend in the evolution of NTTC that will be commented on further in Section 3.2. Moreover, BICROSS will attempt to highlight different textual traditions in a way similar to COMPAUL and CATENA, the former being a project on which Kreinecker was employed. As in the previous examples, this ERC grant also seeks to build training networks for scholars, fostering interdisciplinary scholarship within DH. In addition, the project description announces the development of specific “digital tools to process the vast and linguistically complicated manuscript data in order to pioneer an examination of the entire New Testament bilingual tradition on a larger scale than has ever been possible.”⁷³ This announcement of course sparks curiosity and suggests that there will be further developments in NTTC and DH. However, Christina Kreinecker confirms that neither *Optical Character Recognition* (OCR) nor *Handwritten Text Recognition* (HTR) will be applied.⁷⁴ NTTC is yet to explore OCR/HTR, whereas another ERC project *HandsandBible*,⁷⁵ focused on Hebrew Dead Sea Scrolls literature, has become a leader in this methodology, as we will see in Section 3.3.

3. Analysis: Editing, Multilingualism, Domain Impact, and Automated Recognition of Handwritten Texts

3.1 Digital Editing

As Section 2 clearly demonstrates, NTTC is changing because of the possibility to see manuscripts online, and to study neglected objects, as well as a vast amount of data. The digital culture has clearly left its footprint in this research milieu. There is no surprise here—in DH, the first area of scholarship to develop new methodologies has been that which focuses on editing.⁷⁶ The digital revolution in New Testament editing is described in detail in other chapters of this handbook from a theoretical perspective.⁷⁷ From a pragmatic perspective, Section 2 apparently confirms that all the five projects highlight variants or even manuscripts of the New Testament that were not known from elsewhere. It is a clear result of digging into the virtual manuscripts, and it becomes clearer every day that we have ignored certain aspects of the New Testament textual transmission.

Specific extant versions of the text are clues to now lost versions, and the growth of data increases the need for new tools and methodologies to better understand and characterize the genealogies of New Testament texts, as pointed out by Wasserman and Gurry in 2017:

Because the computer can keep track of all these witnesses and their place in the transmission, there is no need to group them into a few text-types and relate these groups.

⁷² Project description: <https://cordis.europa.eu/project/id/101043730>.

⁷³ Project description: <https://cordis.europa.eu/project/id/101043730>.

⁷⁴ I thank Christina Kreinecker for confirming this in private e-mails.

⁷⁵ Popovic, *HandsandBible*.

⁷⁶ Kirschenbaum, “What.” This is exactly my own experience when attending for the first time a DH conference held at the library of the University of Leiden (NL), in December 2010—all attending colleagues were working on manuscripts and/or text editions (see Clivaz, “Homer,” <https://src-online.ca/index.php/src/article/view/97/144>).

⁷⁷ See in particular Hüffmeier and Paulson, “Editions” (ch. 38); and Houghton, “Practice” (ch. 23) in this volume.

[...] The rejection of the concept of text-types as a mean of understanding the history of the text is significant. What fruit this will bear in the long term remains to be seen.⁷⁸

As implied here, the computing era has not only transformed the daily work of scholars in the field of NTTC but has even challenged the well-established theory of text-types, and the road will surely be long and full of further surprises. With the compilation of exemplary data completed by the last ERC projects in NTTC, the limits of our knowledge of the textual transmission have been extended, and our common understanding of the development of New Testament books must now integrate the unknown part of the textual transmission that can be drafted through new available data.⁷⁹

3.2 The Spreading of a NTTC Multilingual Approach

NTTC has surely not waited for the digital culture before getting involved in a multilingual approach to NT manuscripts. Prolific nineteenth- and early twentieth-century scholars were able to read several ancient languages,⁸⁰ and we can only be impressed by the exhaustivity of their skills and inquiries. In the nineties, a wider multilingual turn has been taken in NTTC thanks to the 1997-publication of the first volume of the *Editio Critica Maior*,⁸¹ described by H. A. G. Houghton, David C. Parker, Peter Robinson, and Klaus Wachtel as “an edition of the New Testament on an unprecedented scale,” with “readings from early translations believed to be based directly on Greek.”⁸² The project titled *Marc Multilingue*, led by Christian Amphoux and Jean-Claude Haelewyck during the nineties, and later joined by J. Keith Elliott has, during its activity up til 2013, also demonstrated the importance of the multilingual study of a Gospel.⁸³

But it is evident that multilingualism has been strongly fostered by the digital possibilities—to be able to see manuscripts online and to have fast and regular contacts with scholars working in different languages and fields are opening doors to a real multilingual practice in NTTC. COMPAUL and a publication like *The Latin New Testament* fully demonstrate this possibility.⁸⁴ Multilingual diversity can also be observed in new VREs, like the database *PAVONE*, focused on Arabic manuscripts of the Gospels, the result of a project led by Elie Dannaoui at the University of Balamand (Lebanon).⁸⁵ Another VRE example is the collaborative multilingual manuscript room of the SNSF five-year project MARK16.⁸⁶ A network of more than twenty scholars has provided a room with folios of Mark 16 in fifty-six manuscripts and ten ancient languages, again integrated with the NTVMR.⁸⁷ The open research data of this project has fostered a collective dynamic around the last chapter of Mark, providing quotable datasets with DOI and giving due credit to every scholar involved.⁸⁸ The potential of

⁷⁸ Wasserman and Gurry, *Approach*, 14 and 16.

⁷⁹ The renewed interest for Codex Bobbiensis (VL 1, 380–420 CE) belongs clearly to this evolution in research. See for example Parker, “Unequally,” 581–588; Upton, *Hearing*; Houghton, *Latin New Testament*; Larsen, “Real-and-Imagined,” 103–131; Clivaz, “Mk 16,” 59–85.

⁸⁰ See, among so many examples, Horner, *The Coptic Version* (1898).

⁸¹ Aland et al., *Editio Critica Maior*, vol. 4/1, *Der Jakobusbrief. James*.

⁸² Houghton et al., “The *Editio*,” 98 and 99.

⁸³ Elliott, “The Endings of Mark’s,” 113–124; Boud’hors, “L’Évangile de Marc en copte sahidique,” <https://manuscripts.hypotheses.org/3971>.

⁸⁴ Houghton, *Latin New Testament*.

⁸⁵ <http://pavone.uob-dh.org>.

⁸⁶ Clivaz, *MARK16*, <https://data.snf.ch/grants/grant/179755>; <https://mark16.sib.swiss>.

⁸⁷ Arabic, Armenian, Coptic (Bohairic, Fayyumic and Sahidic dialects), Ethiopian, Georgian, Greek, Gothic, Latin, Old Church Slavonic, and Syriac.

⁸⁸ The research data is accessible thanks to a partnership with Nakala, the CNRS social sciences and humanities public open repository: <https://mark16-snsf-prima-project.nakala.fr>.

textual criticism and new exegetical findings from a multilingual approach could potentially be without limits, with new material gathered for more decades of research. The ERC project BICROSS will surely confirm this.

3.3 Domain Centered RIs and VREs, and the OCR/HTR Question

As Section 2 has demonstrated, current high-level NTTC scholarship works from and uses its own domain-centered RIs and VREs (see, of course, the NTVMR, common to all the mentioned ERC projects, but also the *Manuscripta Biblica* database developed in PARATEXBIB, or the digital manuscript collection of the *Center for the Study of New Testament Manuscripts*).⁸⁹ Based on this evidence, the massive data which the field of NTTC has generated and the new methodologies developed to analyze this data will continue to require domain-centered RIs and VREs. At the same time, scholars in the field of NTTC should seriously consider the European input to develop cross-disciplinary synergies among the field RIs (see Section 1 and 2.1). The interoperability of data is a major challenge in this respect, and it is highly desirable that the New Testament manuscript transcriptions in various RIs and VREs can be found and accessed through harvesting tools in SSH like the search engine ISIDORE.⁹⁰ NTTC should also open more space in its daily digital work by developing partnerships with VREs concerned with other ancient periods. Interoperability and open research data are decisive concepts for the future of open science.

As a final point, an interdisciplinary comparison of the high-level NTTC in DH projects also reveals an area yet to be explored—the automated recognition of handwritten characters. However, the reading of New Testament manuscripts has remained the privilege of human eyes. Research on the Hebrew Dead Sea Scrolls literature, on the other hand, has followed another path with the recent trend in OCR/HTR approaches as reflected in the ERC project *The Hands that Wrote the Bible: Digital Palaeography and Scribal Culture of the Dead Sea Scrolls* (ERC-STG 2014 call), led by Mladen Popovic from the University of Groningen (NL).⁹¹ The project has made the following discoveries:

[It] has unlocked new information on the manuscripts: one, known as the Great Isaiah Scroll, is now believed to have been written by two different authors. By comparing the composition of individual characters, such as 5 011 incidences of the letter alef (א), the software uncovered an extremely subtle but consistent change in the handwriting halfway through. This shows not only that scribes collaborated on copying biblical scrolls, but also that there was a high degree of professionalism in their mimetic ability to mirror another's scribe style of handwriting.⁹²

One wonders if such an approach could prove to be useful if tested, for example, on Codex Sinaiticus (GA 01) in order to reconsider the complex case of the different scribal hands in this important manuscript, containing the Septuagint, the NT, and some patristic texts.⁹³ Such an enterprise should obviously be interdisciplinary. Popovic's impressive results have been

⁸⁹ <https://ntvmr.uni-muenster.de>; <https://www.manuscripta-biblica.org>; <https://manuscripts.csntm.org/>.

⁹⁰ <https://isidore.science>.

⁹¹ Popović, *Hands and Bible*, <https://cordis.europa.eu/project/id/640497>.

⁹² <https://cordis.europa.eu/article/id/429719-shaking-hands-with-the-authors-of-the-bible>.

⁹³ See for example Myshrall, "The Presence," 139–148; Batovici, "Two B Scribes," 197–206; Nongbri, "The Date," <https://doi.org/10.1093/jts/flac083>.

published in collaboration with Maruf A. Dhali and Lambert Schomaker.⁹⁴ Schomaker is a high-level computer scientist who has worked on OCR for a long time, having developed the *Monk* system for retrieval and recognition of handwritten words in collaboration with the National Dutch Library.⁹⁵ In recent years, alternative OCR/HTR algorithms have been developed and improved in different software tools: *Transkribus*, managed by the European consortium READ-COOP, offers an easy interface for humanist scholars at large;⁹⁶ *Kraken* is developed by a French team at the *Ecole Pratique des Hautes Etudes* (Paris);⁹⁷ also worth mentioning are *Pylaia* and *Aletheia*.⁹⁸

This research in OCR/HTR conducted on several ancient languages should of course draw the attention of scholars in NTTC. I would like, as a final consideration, to suggest a reason for why this has not been the case until now, and why our research milieu still needs to be convinced to test similar approaches. As discussed elsewhere, Kurt Aland and Bonifatius Fischer were already considering the turn toward computers in their writing and research in the seventies, in a very similar way.⁹⁹ Although they were conscious of the potential time saving by the use of computers, they nevertheless remained convinced that this technological turn would not drastically change the daily work of textual criticism. Most NTTC scholars likely share these convictions and prefer to rely on human eyes and knowledge of paleography when it comes to reading ancient manuscripts. I personally share this point of view—the work I have done with my team and network of colleagues on the SNSF MARK16 project has confirmed the inestimable value of human eyes in front of ancient manuscripts.

At the same time, this chapter clearly demonstrates that a large amount of new material is becoming available online. Consequently, it would be a pity not to test OCR/HTR on New Testament manuscripts. One step that I would like to suggest making scholars in our field more interested in OCR/HTR methodologies is to make an in-depth comparison of the human scholarly reading and the computer reading of an ancient manuscript—a test that I have not seen in other OCR/HTR projects so far. Do human researchers and the computer algorithms make similar or different mistakes in transcription? If they are typically different, is there a way to get the most efficient transcription results by aiming for a balance between humans and computers? Such a comparative project should allow to go beyond the simple step of having a human making corrections of the machine reading. Indeed, I anticipate that human eyes in front of a manuscript, without and before the interference of a computer, can read in a specific way and highlight certain aspects which would otherwise be neglected. Let us hope that a future ERC project will conduct such a comparison and open the door to comparing human and computer readings of New Testament manuscripts. The apparent reluctance in the field of NTTC to use OCR/HTR methodologies deserves to be challenged.

I hope that this chapter has demonstrated that NTTC is boosting New Testament studies with access to new, digitized research material, while remaining grounded in a well-established tradition of close reading—a field that takes advantage of digital methodologies while honoring core skills of the humanities.

⁹⁴ Popović et al., “Artificial intelligence,” <https://doi.org/10.1371/journal.pone.0249769>.

⁹⁵ <https://www.ai.rug.nl/~lambert/Monk-collections-english.html>.

⁹⁶ <https://readcoop.eu>; <https://readcoop.eu/transkribus/>.

⁹⁷ <https://www.inria.fr/fr>; <https://github.com/mittagessen/kraken>; Stokes, et al., “The eScriptorium,” <https://classics-at.chs.harvard.edu/classics18-stokes-kiessling-stokl-ben-ezra-tissot-gargem/>.

⁹⁸ <https://github.com/jpuigcerver/PyLaia>; <https://www.primaresearch.org/tools/Aletheia/Usecases>.

⁹⁹ Clivaz, *Ecritures digitales*, 166–180; Aland, “Novi Testamenti Graeci,” 163–177; Fischer, “The use,” 297–308.

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