

## Introducing the ITSEE Patristic Citations Database

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# Introducing the ITSEE Patristic Citations Database

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## ABSTRACT

This article introduces the citations database developed by the Institute for Textual Scholarship and Electronic Editing (ITSEE) at the University of Birmingham. The material was collected in order to supply indirect evidence for creating major editions of the New Testament in Greek and Latin: the *Novum Testamentum Graecum Editio Critica Maior* (ECM) editions of John and the Pauline Epistles, and the *Vetus Latina* (VL) editions of *John* and the first four Pauline Epistles. The article describes how the data was gathered and the interface was developed. It also gives details of the team's collaboration with the Biblindex project. Information is provided about the current contents of the database and how it may be accessed and used by those outside the project.

Patristic citations play an important role in establishing the textual history of the New Testament and as such form an integral part of a critical edition. The Institute for Textual Scholarship and Electronic Editing (ITSEE) citations database was created to provide source material for the critical editions produced within ITSEE, namely the *Novum Testamentum Graecum Editio Critica Maior* (ECM) editions of John and the Pauline Epistles and the *Vetus Latina* (VL) editions of *John* and the first four Pauline Epistles. The database contains citations of these New Testament books found in Greek patristic works from the first six centuries and Latin patristic works from the first eight centuries. The link to our editorial work means that alongside metadata about a citation, such as what verse is cited in what work, the database also stores the text of the biblical citation itself. In this aspect our database differs from the Biblindex project which, while much larger in scope, does not currently provide the text of any citations.<sup>2</sup> This paper introduces the current release of the ITSEE

<sup>1</sup> The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 283302 (COMPAUL: 'The Earliest Commentaries on Paul in Greek and Latin as Sources for the Biblical Text').

<sup>2</sup> For more on the scope and search options available in Biblindex see Laurence Mellerin 'New Ways of Searching with Biblindex, the Outline Index of Biblical Quotations in Early Christian Literature', in Claire Clivaz, Andrew Gregory and David Hamidović (eds), *Digital Humanities in Biblical, Early Jewish and Early Christian Studies* (Leiden, 2014), 177-90. Plans are in place to include the biblical text cited and link to the relevant section of the patristic work. This analysis work has started for a limited number of texts and is described in *ead.*, 'Methodological Issues in

citations database which was largely developed as part of the COMPAUL project.<sup>3</sup>

The citations available in the database have been collected over several decades under the auspices of successive editorial projects and often in collaboration with other research groups. Although the database itself has existed in several different forms, the details of these are not of particular relevance; however, the journey taken by the data itself is worth documenting. The majority of the Latin citations were entered from a card index made available by the Vetus Latina Institute. The card index predates the establishment of the Institute, having been started in the early 1900s by Joseph Denk, but they share the same motivation: to produce an updated edition of Pierre Sabatier's 1743 edition of the Old Latin text.<sup>4</sup> Members of the institute have expanded and updated the index of citations over the years, which at the time of writing was reported to have around one million entries.<sup>5</sup> The card index was digitally photographed in 1999 and these photographs were made available online by subscription in 2002.<sup>6</sup> As part of the *Vetus Latina Iohannes* project, the citations of *John* in this index were entered into spreadsheets.<sup>7</sup> Further spreadsheets were prepared of biblical citations in works by specific authors, in particular Augustine and Hilary of Poitiers, which had been collected directly from the writings of these authors, often relying on scriptural indices in critical editions. These were then cross referenced with the entries from the card index.<sup>8</sup> The Greek data for *John* has a similar history. It has its origins in a card index created as part of the International Greek New Testament Project (IGNTP) by Gordon Fee and others. The data was entered into a spreadsheet by Roderic Mullen and compared with

BiblindeX, An Online Index of Biblical Quotations in Early Christian Literature', *SP* 54 (2013), 11-32, 18-26 and Elysabeth Hue-Gay, Laurence Mellerin and Emmanuelle Morlock, 'TEI-encoding of Text Reuses in the BIBLINDEX Project', *Journal of Data Mining and Digital Humanities. Special Issue on Computer-Aided Processing of Intertextuality in Ancient Languages* (2017). The BiblindeX database homepage is <http://www.biblindeX.mom.fr/>. Further details of our collaboration with the BiblindeX project are given below.

<sup>3</sup> For details of this project, see the note above and [www.birmingham.ac.uk/compaul](http://www.birmingham.ac.uk/compaul)

<sup>4</sup> H.A.G. Houghton, 'The Use of the Latin Fathers for New Testament Textual Criticism', in Bart D. Ehrman and Michael W. Holmes (eds), *The Text of the New Testament in Contemporary Research. Essays on the Status Quaestionis*, 2<sup>nd</sup> ed., NTTSD 42 (Leiden, 2013), 375-405, 385; *id.*, *The Latin New Testament: A Guide to its Early History, Texts, and Manuscripts* (Oxford, 2016), 116. On Sabatier's work see *id.*, *Latin New Testament* (2016), 113-5.

<sup>5</sup> [http://www.vetus-latina.de/en/institut\\_vetus\\_latina/institut.html](http://www.vetus-latina.de/en/institut_vetus_latina/institut.html)

<sup>6</sup> H.A.G. Houghton, 'The Use of the Latin Fathers' (2013), 387.

<sup>7</sup> This project was funded by the AHRC from 2005-2010. The researchers were Philip H. Burton, H.A.G. Houghton, Jon Balsarak and Rosalind F. MacLachlan. They were assisted in some of the editing and data entry tasks by a small team of students. The project data entry guidelines are available online as H.A.G. Houghton, *Vetus Latina Iohannes Database Transcription Guidelines 1.0*. (2005), <http://epapers.bham.ac.uk/2945/>.

<sup>8</sup> See H.A.G. Houghton 'Patristic Evidence in the New Edition of the Vetus Latina Iohannes', *SP* 54 (2013), 29-85, 70.

data collected by the Institut für neutestamentliche Textforschung (INTF) in Münster.<sup>9</sup>

The spreadsheets were first converted into a database in 2007 which was made available online in 2009. The initial plan for the citations database was outlined by Parker in 2008,<sup>10</sup> but this still describes a flat spreadsheet-like structure. By the time the data was released online it was using a relational database to provide more information and, crucially, improve the consistency of data entry. As part of the restructuring of the data individual records were created for all of the authors, works and editions referenced by abbreviations in the spreadsheets of citations.<sup>11</sup> The Latin data was checked, and where possible expanded with reference to the editions listed in Gryson's *Répertoire Général*, which is also the source of all of the abbreviations for the Latin citations data.<sup>12</sup> The Greek data was checked against the *Clavis Patrum Graecorum* (CPG).<sup>13</sup> Unlike Latin, there is no single system of abbreviation for Greek authors and works; instead the ECM editors created a system based on Lampe's *Patristic Greek Lexicon*.<sup>14</sup> The current relational database structure, only slightly different from the original, is shown in Figure 1 and described in more detail below.

Inevitably some compromises had to be made in the conversion process from spreadsheet to database. In all cases the cause was a single cell being used to store data which, while perfectly readable to humans, would ideally be separated into discrete fields in a database for ease of searching. For example, the details of the critical edition from which a citation has been supplied are usually given in full in a single cell for the Greek data such as 'M. Aubineau, SC 187 (Paris, 1972), 206-14'. For Latin these are abbreviated to author and year, for example 'Migne 1845', or series abbreviation and volume number such as 'CC2' which also occupies a single cell.<sup>15</sup> For manuscript variants

<sup>9</sup> Gordon D. Fee revised by Roderic L. Mullen 'The Use of the Greek Fathers for New Testament Textual Criticism', in B.D. Ehrman and M.W. Holmes (eds), *The Text of the New Testament in Contemporary Research, second edition* (2013), 351-74, esp. 368.

<sup>10</sup> David C. Parker, *An Introduction to the New Testament Manuscripts and their Texts* (Cambridge, 2008), 115-6.

<sup>11</sup> The initial conversion work was completed by Zeth Green and R.F. MacLachlan.

<sup>12</sup> Roger Gryson, *Répertoire Général des Auteurs Ecclésiastiques Latins de l'Antiquité et du Haut Moyen Âge, Vetus Latina 1/1. 2 vols.* (Freiburg, 2007); see also H.A.G. Houghton 'Patristic Evidence' (2013), 70.

<sup>13</sup> M. Geerard, F. Glorie and J. Noret, *Clavis Patrum Graecorum, CC, 5 volumes plus 2 supplementary volumes* (Turnhout, 1974-2003).

<sup>14</sup> The American and British Committees of the International Greek New Testament Project, *The Gospel According to St. Luke, Part 1* (Oxford, 1984), xii-xiii; G.W.H. Lampe, *A Patristic Greek Lexicon* (Oxford, 1961), ix-xliii. The CPG does provide a system of numbers for identifying works but these are not used in the edition to avoid confusion with the numbers used to identify manuscripts. See D.C. Parker *An Introduction* (2008), 114.

<sup>15</sup> H.A.G. Houghton, *Transcription Guidelines 1.0.* (2005).

a single cell contains data such as ‘quia numquid] quia nunc quid T1, quid T2’ which indicates that the words *quia numquid* in the citation text (which in this case is ‘quia numquid me quaeritis occidere?’) are replaced by *quia nunc quid* in witness T1 and *quid* in witness T2. Dependencies on other patristic works are also given in shorthand form in a single cell, thus ‘< AU Jo 46.8’ indicates that this particular biblical citation from Julian of Toledo is actually a quotation of Augustine’s *Tractates on John*. Automatic separation of the data was considered but slight variations in data format and typographical errors posed a risk of ending up with data that was neither human nor machine readable. It was therefore decided to keep the human readable form for each entry in a special legacy data field while at the same time forcing new records to be entered using separate fields. In the course of editing, the legacy data for the Greek has mostly been resolved into the preferred format.<sup>16</sup>

All of the Pauline citations available in the database were entered as part of the COMPAUL project. Before work began, custom data entry forms were designed so as not to replicate the problems encountered with *John*. These forms are described in more detail below. The source of the Latin data remained the Vetus Latina card index. The citations were entered into the database by a researcher and a small team of students. The COMPAUL team experimented with using the search functionality in the Brepols *Library of Latin Texts* to find citations, but a comparison of the first chapter of *Galatians* showed that better coverage was provided by the card index. A further experiment on the Latin side was the entry of citations from selected Pauline commentaries which included an analysis of both the lemma text and that found in the exegesis.<sup>17</sup>

As no card index of Pauline citations in Greek patristic works had been prepared by the IGNTP, the initial plan was to work through the epistles searching the *Thesaurus Linguae Graecae* (TLG) to identify instances of citations.<sup>18</sup> This method was followed for *Galatians* but required an experienced researcher and proved too time consuming to extend to the remaining epistles within the timescale of the project.<sup>19</sup> Citations for the remaining epistles were gathered in collaboration with the Biblindex team who kindly provided a spreadsheet of their references for the COMPAUL Project to verify and add text.<sup>20</sup> The references

<sup>16</sup> This was largely undertaken by Dr Amy Myshrall as part of the International Greek New Testament research project funded by the AHRC from 2010-15, followed by a British Academy/Leverhulme Small Research Grant in 2014-16.

<sup>17</sup> The commentaries studied were those of Ambrosiaster, Rufinus, Pelagius, Jerome, Marius Victorinus and the anonymous Budapest commentary. This work was undertaken by Christina M. Kreinecker and R.F. MacLachlan in conjunction with H.A.G. Houghton.

<sup>18</sup> <http://stephanus.tlg.uci.edu/>

<sup>19</sup> This work was carried out by Susan B. Griffith.

<sup>20</sup> We are grateful to L. Mellerin for providing us with this data.

available through Biblindex have their origins in the *Biblia Patristica* index of citations begun in 1965 by the Centre for Patristics Analysis and Documentation which had the goal of producing ‘a comprehensive inventory of all biblical quotations and allusions in ancient Christian literature’.<sup>21</sup> After work on this project had ended following the publication of the seventh volume in 2000, the published and unpublished data gathered by the team was handed over to Sources Chrétiennes, who made it available online through the Biblindex database.<sup>22</sup> The data available through Biblindex, and provided to us, consists of the biblical verse reference, the patristic work and its attributed author and the location of the citation within the work and edition.<sup>23</sup> A small team of students were paid to work through the records work by work identifying each reference in the *TLG* and then entering the biblical text into the database. As the Biblindex references include paraphrases and allusions it was not expected that the text of every citation would be found; however, any references not located by the students were checked by a more experienced researcher before being discounted.

The incorporation of the Biblindex data introduced new technical challenges. The main one was the identification of authors and works, because there was no correlation between our identifiers and those used by Biblindex. In some cases it was possible to map the works using the Clavis numbers, but while they are used consistently in the Biblindex data this was not the case in Birmingham’s material. There were also more fundamental problems: sometimes the Birmingham database uses a single Clavis number for a whole series of works where Biblindex uses the Clavis number with subdivisions. This is found particularly in fragmentary works: for example, the Birmingham database records Didymus Caecus, *Commentarii in Ecclesiasten* under the single Clavis number *CPG 2555* but Biblindex has six separate subdivisions of this number. Any works that could not be mapped automatically were handled manually. If it was still not possible to find an existing equivalent, a new record was made in the work and/or author tables using the Biblindex data. These records contain a special flag to indicate that they were automatically created for this integration and will be manually edited in preparing the data for use in the critical editions. To maintain compatibility between our data and that of Biblindex, where works and authors could be mapped to our data the identifiers used in the Biblindex data were added to a new field in the records. This same approach can be used to create compatibility with other databases such as that planned

<sup>21</sup> <http://biblindex-en.hypotheses.org/22>.

<sup>22</sup> L. Mellerin, ‘Methodological’ (2013), 11-3. For a more detailed history of the project and its data see also <http://biblindex-en.hypotheses.org/22>.

<sup>23</sup> L. Mellerin, ‘New Ways of Searching with Biblindex’ (2014), 177-90, 177.

by Jennifer Strawbridge.<sup>24</sup> A related issue is works whose attribution is contested. In a few cases we attribute a work to one author while Biblindex attributes it to another. This problem is addressed in a similar way by adding a field to the work records which notes links to other possible authors.

A further unrelated problem was faced when dealing with Biblindex citations that span multiple verses. Since the patristic evidence in our editions is reported verse by verse, that is also the model we use in the database. Data on chains of citations is collected but is listed in a *catena* field and is not limited to adjacent verses. To allow for ranges the students entering the citation text were instructed to enter a carriage return between each verse, but when the data was processed the lines of text did not always match the number of verses expected. Where they did match, the citation text was split over the verses in the range. Where they did not match an entry was still made for each verse in the range but the citation text for the whole range was added to each of the entries. A special flag is used in the records of multiple-verse citations to explain the potentially strange data to future editors who can then select the correct portion of the citation text.

The current incarnation of the ITSEE citations database is written in Django with a PostgreSQL database used for storage.<sup>25</sup> To make it easy for other applications to use the data an API is provided using the Django REST framework.<sup>26</sup> The database includes information about authors, works and editions as well as the text of the biblical citations and a few other additional fields such as publication series and online corpus. The database structure centres around the concept of a patristic work, because this proved to be the most stable of the concepts involved: as the VL and IGNTP editions cite the patristic work in the critical apparatus, this gives each work a comparable status to the biblical manuscripts deployed in these editions. Author attribution can change with new research; as discussed already, different authors are sometimes assigned to the same work by different authorities; similarly, new editions continue to appear of individual works. A citation, however, is still a citation of a work regardless of the author to which it is attributed or the edition of the work from which the text comes. There is, of course, a chance that a new edition will change the text of the biblical citation, which is why we record details of the edition used for each citation entered. Figure 1 shows a simplified diagram of the relationships in the database.<sup>27</sup>

<sup>24</sup> Jennifer R. Strawbridge, *The Pauline Effect. The Use of the Pauline Epistles by Early Christian Writers*, Studies of the Bible and its Reception 5 (Berlin, 2015), 180. While the ITSEE database was being developed Strawbridge's database was still in the planning stages. IG is now available online, see Jennifer Strawbridge, Paul and Patristics Database [30/04/2019].

<sup>25</sup> <https://www.djangoproject.com/>, <https://www.postgresql.org/>

<sup>26</sup> <http://www.django-rest-framework.org/>

<sup>27</sup> This diagram represents the structure defined in the Django project which is then mirrored in the PostgreSQL database underlying it. The term *model* is used in Django to refer to what would be called a *table* in a relational database schema. The term *model* is used in this article.

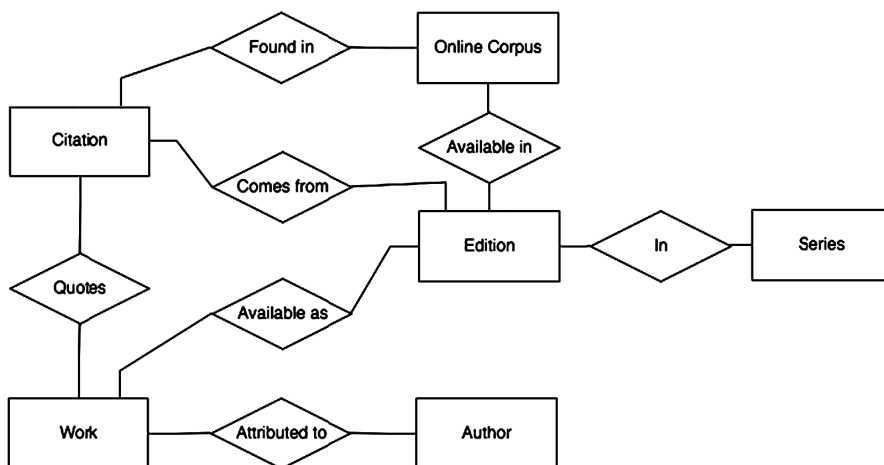


Figure 1: A simplified diagram of the database relations

Each rectangle represents a model in the database and each line a relationship between the models, with the diamonds naming the nature of the relationship. The diagram makes no attempt to indicate the cardinality of the relationship, for example whether it is a one-to-many relationship or a many-to-many relationship. An omission that warrants explanation is the relationship between a citation and its corresponding biblical text. There is a separate model in the database that represents a biblical work: while each citation contains a reference to the appropriate entry in that model, there are no models for chapter and verse; these are simply recorded as numbers as they refer to an agreed external system and do not need to be further defined internally.<sup>28</sup>

The citation database is available online at <https://www.birmingham.ac.uk/itsee-citations-database>. The HTML interface to the database allows each of the models identified in Figure 1 to be viewed as a list of records. An example of the list view of the citation table is shown in Figure 2. The page navigation and an option to adjust the number of records per page can be found at the top right. On the left the user can apply a filter to the data on any of the fields that appear in the table.

<sup>28</sup> Both the Greek and Latin editions in production at ITSEE will be presented according to the standard Greek versification system despite some disagreement between this and Latin editions. Because of this, the database system also corresponds to the Greek verse divisions. Biblindex has had to take a much more complex approach to this motivated by the desire to let each tradition maintain its own system. The reasons for this and the solutions used are summarised in L. Mellerin, 'Methodological Issues' (2013), 15-8.



Ref	Author	Work	Work Ref	Page	Line	Text	Comments
view	John.1.1 ACa:Caec: ACacius Caesariensis	FiMarcell		3.263	23	κα ἀρχῆ μὲν το θεός, ἦν ὁ λόγος	
view	John.1.1 Agath: Agathangelus	PassGmg	71		5	καὶ ἄρχῆ, ὁ θεὸς λόγος, κτιστὸς ὄντων ἐν ἀρχῇ ἦν ὁ λόγος, καὶ ὁ λόγος ἦν πρὸς τὸν θεόν, καὶ θεὸς ἦν ὁ λόγος	
view	John.1.1 AA: Alexander Alexandrus	Enc	4	8	18	ἐν ἀρχῇ ἦν ὁ λόγος.	Main reading checked against online pdf at archive.org.
view	John.1.1 AA: Alexander Alexandrus	EpAl	14	22	10	ἐν ἀρχῇ ἦν ὁ λόγος, καὶ ὁ λόγος ἦν πρὸς τὸν θεόν, καὶ θεὸς ἦν ὁ λόγος.	Main reading checked against online pdf at archive.org.
view	John.1.1 ASal: Alexander Salaminus	Cruc		87.4017	6	λόγος, ὁ ἐν ἀρχῇ τῶν πρῶτος, τὸν ἀπὸ οὐρα θεόν	
view	John.1.1 AM: Ambrosius	118 Ps	14.23.1	313	9	in principio erat uerbum et uerbum erat apud deum et deus erat uerbum	
view	John.1.1 AM: Ambrosius	ep	77.5	129	48	et ille quasi coeternum loannes Uerbum apud Deum uicit	
view	John.1.1 AM: Ambrosius	ep	11.14	86	154-8	Il homo quod est diuinus, quod est sempiternus, et quod erat ab initio et quod erat apud Deum, hoc est. Dei uerbum ipsum est illud diuinum, in quo uinitus et sumus et mouetur. ipsum est quod erat in principio	
view	John.1.1 AM: Ambrosius	ep	add 14.49	260	490	inlum deum habere utique non potuit qui erat in principio	
view	John.1.1 AM: Ambrosius	ex	1.5.18	15	21	uerbum autem dei in principio erat et erat semper	
view	John.1.1 AM: Ambrosius	ex	6.7.41	232	14	(ipse est inago patris) qui semper est et erat in principio	
view	John.1.1 AM: Ambrosius	fi	1.56	24		in principio enim erat uerbum et uerbum erat apud deum et deus erat uerbum, (hoc erat in principio apud deum. Erat, inquit, apud deum: erat, erat, erat, eoque erat) Abh quoque Joannes in epistola sua dicit: Quod erat in principio	This is fine OK
view	John.1.1 AM: Ambrosius	fi	5.118	260		in principio erat uerbum et uerbum erat apud deum	
view	John.1.1 AM: Ambrosius	fi	1.57	25		quod (...) erat in principio, quod (...) erat apud deum et deus erat uerbum quod uero erat in principio apud deum	
view	John.1.1 AM: Ambrosius	fi	1.122	52		scriptura dicit erat, non dicit non erat, denique Iohannes scripsit in principio enim erat uerbum et uerbum erat apud deum et deus erat uerbum, (hoc erat in principio	

Figure 2: A screen shot of the list view of the citation model in the database

Work	
Author	AU: Augustinus
Abbreviation	Cae
Title	Sermo ad Caesariensis ecclesiae plebem
Bibliindex identifiers	
Ciavis	0339
Language	Latin
Year	418
Translated	x
Transmitted in Another	x
Comments	
Editions	AU_Cae_edition_1
Citations	<p>John 14:4 non est immunis a peccato, nec infans cuius est unius diei uita super terram.</p> <p>John 14:27 legiatur enim testamentum eius qui nos sibi fecit coheredes in eo recitatur pacem meam do uobis pacem meam relinquo uobis</p> <p>John 14:27 pacem meam do uobis, pacem meam relinquo uobis</p> <p>John 14:27 pacem meam do uobis, pacem meam relinquo uobis</p> <p>John 14:27 testamentum lego pacem meam do uobis pacem meam relinquo uobis</p> <p>1 Corinthians 1:12 ego sum Pauli, ego uero Apollo, ego uero Cephae</p> <p>1 Corinthians 1:13 diuinus est Christus?</p> <p>1 Corinthians 1:13 numquid Paulus pro uobis crucifixus est?</p> <p>1 Corinthians 1:13 numquid in nomine Pauli baptizati estis?</p> <p>1 Corinthians 7:4 uxor... non habet potestatem corporis sui, sed uir; similiter uir non habet potestatem corporis sui, sed mulier.</p> <p>1 Corinthians 13:2 si sciero omnia sacramenta,</p> <p>1 Corinthians 13:2 si sciero omnia sacramenta, si habeam omnem prophetiam... et omnem scientiam... si habeam omnem fidem,</p> <p>1 Corinthians 13:2 si sciero omnia sacramenta, si habeam omnem prophetiam... et omnem scientiam... si habeam omnem fidem,</p> <p>1 Corinthians 13:2 si sciero omnia sacramenta, si habeam omnem prophetiam... et omnem scientiam... si habeam omnem fidem,</p> <p>1 Corinthians 13:2 si sciero omnia sacramenta, si habeam omnem prophetiam... et omnem scientiam... si habeam omnem fidem,</p> <p>1 Corinthians 13:2 ita ut omnes transferam, caritatem autem non habeam nihil sum?</p> <p>1 Corinthians 13:2 si habuero omnia sacramenta, omnem scientiam, prophetiam, fidem... ita ut montes transferam, caritatem autem non habeam, nihil sum.</p> <p>1 Corinthians 13:2 si caritatem non habeam, nihil sum.</p> <p>1 Corinthians 13:2 si tradidero corpus meum ut ardeam, caritatem autem non habeam, nihil mihi prodest.</p>

Figure 3: A screen shot of a work in the database

The data can also be sorted on each column by clicking on the black arrows in the table header. The column on the far left provides a link to view the more detailed information for that record. The detailed view of each record gives appropriate links to related data. The example of a detailed record of a work in Figure 3 shows a link to the author record on the top line, a link to the edition data a little further down and at the bottom links to each of the citations we

have from this work including the biblical reference and the text. This data is also available to other applications via an API which returns the data serialised in JSON.<sup>29</sup>

Data can only be entered and edited by users who are logged into the system and have the correct permissions in the database. To allow more fine-grained control, a project system is also used. Projects typically specify a language and a biblical book but can also be used to restrict users to particular authors and/or works. When a user is given permissions to add or edit the citation data they are also assigned to the appropriate project or projects. They will not be allowed to enter or edit data unless they have selected the correct project from those they have permission to access. The project settings are used to auto-complete and disable certain fields in the editing form, such as language and biblical book. They can also be used to control which sections of the form and what submission buttons editors see, depending on their category of editor. For example, if users are adding data from a card index rather than a critical edition, they do not need to worry about the sections of the form concerned with recording alternative readings and their manuscript support. The introduction of detailed project settings allows the use of one basic form to add data from multiple different sources without exposing users to aspects of the data irrelevant to them. As described above, our data is entered from a number of different sources, making this an important aspect of the database design. A further advantage of using a custom entry form over a spreadsheet is the use of select boxes for fields such as author and work. This cuts down on typing errors and ensures the data stored is consistent.

One of the new features added in the most recent release of the ITSEE citations database is the ability to search the data. Two search options are provided, a quick search and an advanced search. The quick search option allows a search for citations of a particular verse with the option of restricting the results to a specific language. The advanced search option allows the user to search any of the key models in the database such as authors and works, as well as the citations. It also exploits the relations between the models to enable searches for all the citations of a particular work, or all of the citations of a particular author, or even all the citations of a particular edition of a work. With the advanced search, multiple fields can be queried at the same time which allows complex searches to be created. An auto-suggest function is provided for string fields such as abbreviations, full names and titles to help with accuracy. The type of search available depends on the options available for the field selected, with parameters such as *equals*, *starts with* or *contains*. The range of options for searching strings allows complex searching for words and phrases in the citations themselves. For example, searching all of

<sup>29</sup> For information about JSON see <http://www.json.org/>; details of how to access the api can be found here: <https://www.birmingham.ac.uk/itsee-citations-database>

Ref	Author	Work	Page	Line	Text	Comments	
view	John.7.10 AU: Augustinus	ep	82.2.18	370	1	nec fallaciter ascendit ad diem festum usque adeo non causa ostentationis coram hominibus ut non euidenter ascendit sed latenter	
view	John.7.10 AU: Augustinus	ep	82.18	370	1	nec fallaciter ascendit ad diem festum usque adeo non causa ostentationis coram hominibus ut non euidenter ascendit sed latenter	
view	John.7.10 AU: Augustinus	Fau	22.36	630	7	et ad diem festum non euidenter sed latenter ascendit	
view	John.7.10 AU: Augustinus	Fau	22.36	630	7	et ad diem festum non euidenter sed latenter ascendit	
view	John.7.10 AU: Augustinus	Jo	28.8.21	261		quid era autem quasi latenter adscendit ad diem festum	
view	John.7.10 AU: Augustinus	Jo	28.8.22			quasi latenter adscendit ad diem festum	
view	John.7.10 AU: Augustinus	Jo	28.8.24			quasi latenter adscendit	
view	John.7.10 AU: Augustinus	Jo	28.8.26	262		sed quasi latenter dixit	
view	John.7.10 AU: Augustinus	Jo	28.8.26			quasi latenter	
view	John.7.10 AU: Augustinus	Jo	28.8.28			non uicini quod latenter ascendit christus ad diem festum quia ipse habebat in illo die festo	
view	John.7.10 AU: Augustinus	Jo	28.8.28	262		latenter adscendit Christus ad diem festum	
view	John.7.10 BED: Beda Venerabilis	Lc	1	96	3102	ad diem festum non euidenter sed latenter ascendit	
view	John.7.10 HI: Hieronymus	ep	116.18.4	410	5	nec fallaciter ascendit ad diem festum usque adeo [...] ut non euidenter ascendit sed latenter	Text in CLCLT as AU ep 82.2, p.369.17, vol.34.2
view	John.7.10 KA: Capitula preceding Gospel	Cy	25	304		... et ad diem festum postea latenter ascendit ...	
view	2Cor.11.33 GR-M: Gregorius Magnus, Pope	dia	2.3	63	20	daneasi persecutionem passus ut potuisset euadere murum tunem sportantque quaesult seque latenter deponi uoluit	

Figure 4: A screen shot of the search results for *latenter*

the citations for the Latin word *latenter* occurring anywhere in the text of a citation yields the results shown in Figure 4. The results of the search are presented in the same list view shown in Figure 2. The results can be sorted, and links are also given to the full record data. The filter option is not available for the search results, but the query is stored so that the user can return to the completed search form using either the back button or the link in the breadcrumb trail. This enables the user to make modifications without having to recreate the query from scratch.

The database currently contains 232,997 citations; of these 72,254 are in Greek and 160,752 in Latin.<sup>30</sup> Of the 63,211 citation records supplied by Biblindex the COMPAUL Project was able to locate the text of 40,495 (about 64 per cent). Although our Latin citations are limited to fewer biblical books, the volume of citations is higher for than for Greek as there are more works in Latin from the period of interest and the time period covered for Latin is also two centuries longer. A breakdown of citation volume by book and language is shown in Table 1.

Biblical book	Greek Citations	Latin Citations
John	27,433	61,300
Romans	10,522	37,974
1 Corinthians	10,571	34,477
2 Corinthians	4,122	15,312
Galatians	4,324	11,689
Ephesians	2,325	—

<sup>30</sup> These figures do not include any Biblindex references for which we have thus far not been able to identify text.

Philippians	2,802	–
Colossians	2,362	–
1 Thessalonians	948	–
2 Thessalonians	283	–
1 Timothy	2,010	–
2 Timothy	438	–
Titus	227	–
Philemon	189	–
Hebrews	3,689	–

Table 1: A breakdown of citations in the database by language and biblical book

The top ten authors with the most entries in the database for each language are shown in Table 2. The most referenced biblical verses in the database are shown in Table 3.

Greek		Latin	
Author	Citations	Author	Citations
<i>Iohannes Chrysostomus</i>	18,502	<i>Augustinus</i>	43,691
<i>Origenes</i>	16,325	<i>Rufinus Aquileiensis</i>	9,099
<i>Didymus Caecus</i>	7,217	<i>Hieronymus</i>	8,379
<i>Cyrillus Alexandrinus</i>	6,317	<i>Ambrosiaster</i>	7,877
<i>Basilius Caesarensis</i>	5,351	<i>Ambrosius</i>	5,836
<i>Theodoretus Cyrrhensis</i>	4,947	<i>Beda Venerabilis</i>	4,445
<i>Gregorius Nyssenus</i>	4,239	<i>Flavius Magnus Aurelius Cassiodorus</i>	3,386
<i>Eusebius Caesariensis</i>	3,935	<i>Hilarius Pictavensis</i>	3,230
<i>Epiphanius Constantiensis</i>	2,890	<i>Pseudo-Augustinus</i>	3,164
<i>Athanasius Alexandrinus</i>	2,778	<i>Fulgentius Ruspensis</i>	2,974

Table 2: The authors with the most citations in the database in each language<sup>31</sup>

<sup>31</sup> The sixth spot in the ranked table is actually taken by all of the works by anonymous authors with 4,537 citations.

Greek		Latin	
Verse	No. Citations	Verse	No. Citations
<i>John 1:1</i>	703	<i>John 1:14</i>	2,097
<i>John 1:14</i>	673	<i>John 1:1</i>	1,699
<i>Philippians 2:7</i>	554	<i>John 1:3</i>	1,619
<i>Galatians 4:26</i>	548	<i>John 14:6</i>	1,041
<i>1Corinthians 1:24</i>	536	<i>1Corinthians 1:24</i>	796
<i>John 1:3</i>	463	<i>John 10:30</i>	674
<i>Colossians 1:15</i>	444	<i>John 1:29</i>	624
<i>John 14:6</i>	421	<i>John 1:9</i>	586
<i>1Corinthians 1:30</i>	387	<i>Galatians 5:17</i>	563
<i>John 14:9</i>	357	<i>Romans 5:5</i>	553

Table 3: The most quoted verses in each language

At present the data available is largely unedited; some entries are duplicates and the citation text does not necessarily represent the most recent critical edition available. As each of our editions is produced the relevant data will be revised and edited. To make it easy for editors to incorporate the citations into critical editions we plan to integrate the database with our editing tools. This will enable editors to see the completed apparatus of all the manuscripts for a verse alongside the citations so they can judge where patristic evidence should be included. As explained at the beginning of this paper, the goal of the database is primarily to provide data for critical editions, both for publication in printed form and for full-text linking within electronic editions. This explains its limited coverage, restricted to certain biblical books, languages and time periods.<sup>32</sup> There is no dedicated funding or long-term development plan for the database: instead, the aim of the editors is to make the production of their editions as transparent as possible and ensure that, just as each edition relies on extensive collaborative work by scholars over a number of decades, so other projects and researchers are able to re-use the data gathered for the production of each edition. In making this ongoing ‘work-in-progress’ publically available, it is hoped that not only its raw data, but also features such as the search interface

<sup>32</sup> A database of Greek citations of Acts has been prepared independently by the INTF in conjunction with their work on the ECM of this book, and it is expected that this will be extended to the Synoptic Gospels for the planned ECM.

which presents more fine-grained information about citation patterns and allows the identification of occurrences of individual words or phrases within the biblical text supplied for each citation, make this database a useful addition to existing tools for the study of the use of the New Testament in early Christian writings.

