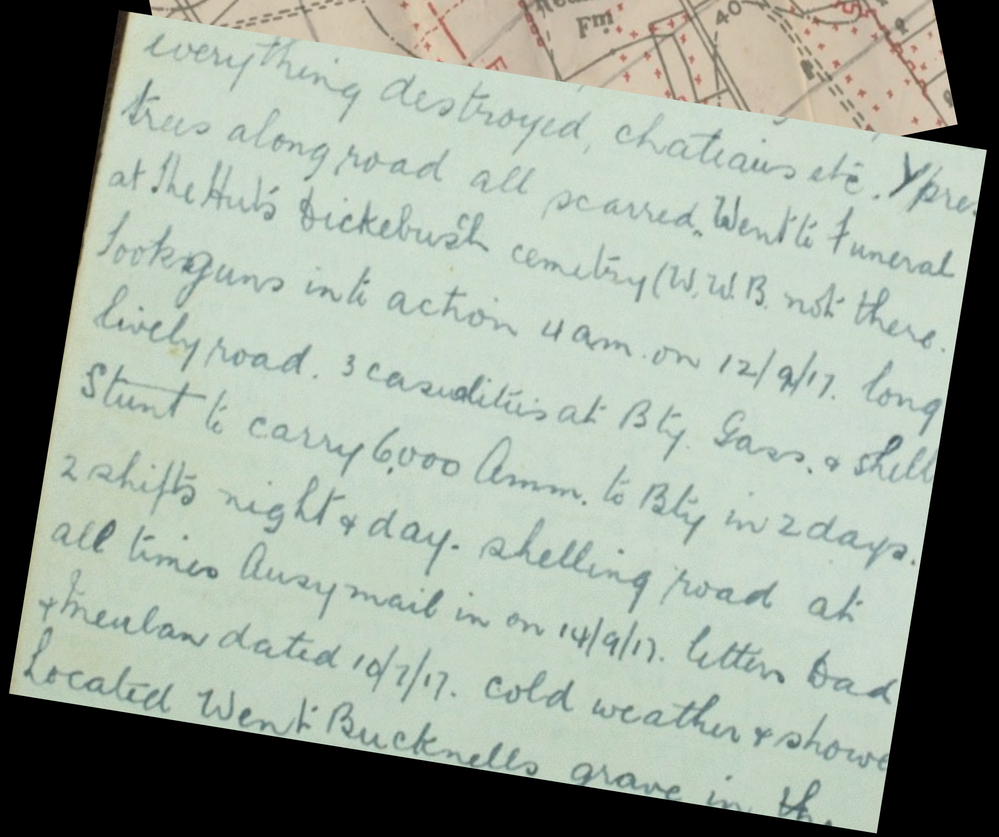
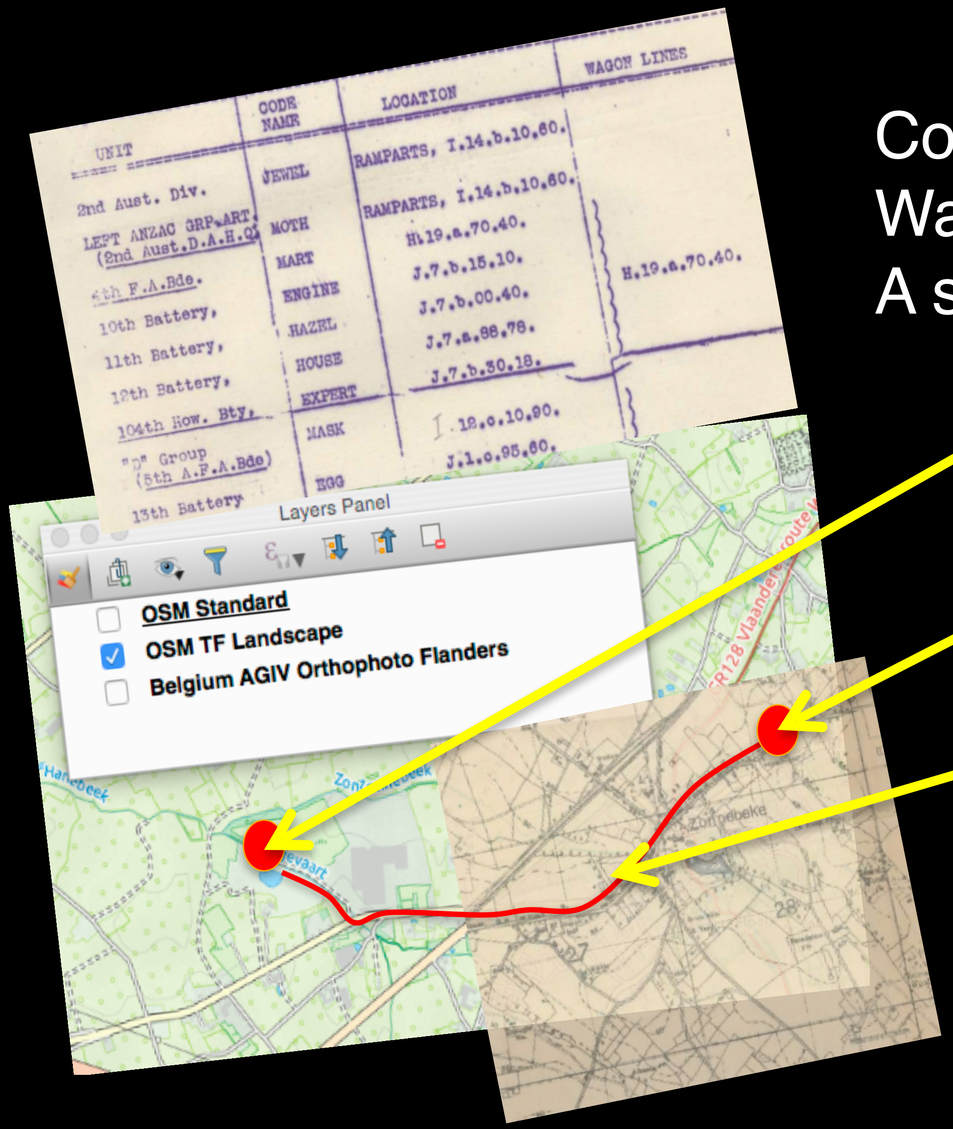
If … provisions fail to arrive … armies will be in difficulty.

Sun Tzu[1].



GIS opens a new study area and perspective in WWI historiography.



Coordinate data.
War materiel data.
A serviceman's diary.

A database.

Projecting WWI maps onto a single map project.

A new way of looking at war…

Warren Lewington (MRes: Modern History)

Department of Modern History, Macquarie University.

FOAR705 – Digital Humanities

Proof of Concept Presentation

A WWI limber video
(ABC News).

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Introduction
- Research Topic
- This Proof of Concept

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- The data model
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Conclusions

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Introduction

Research Topic

This study is about an Australian serviceman's experience serving in World War One Field Artillery Battery (FAB) supply logistics in Belgium.

The diary was written by Private (driver) Alfred James Lewington.

The study will combine:

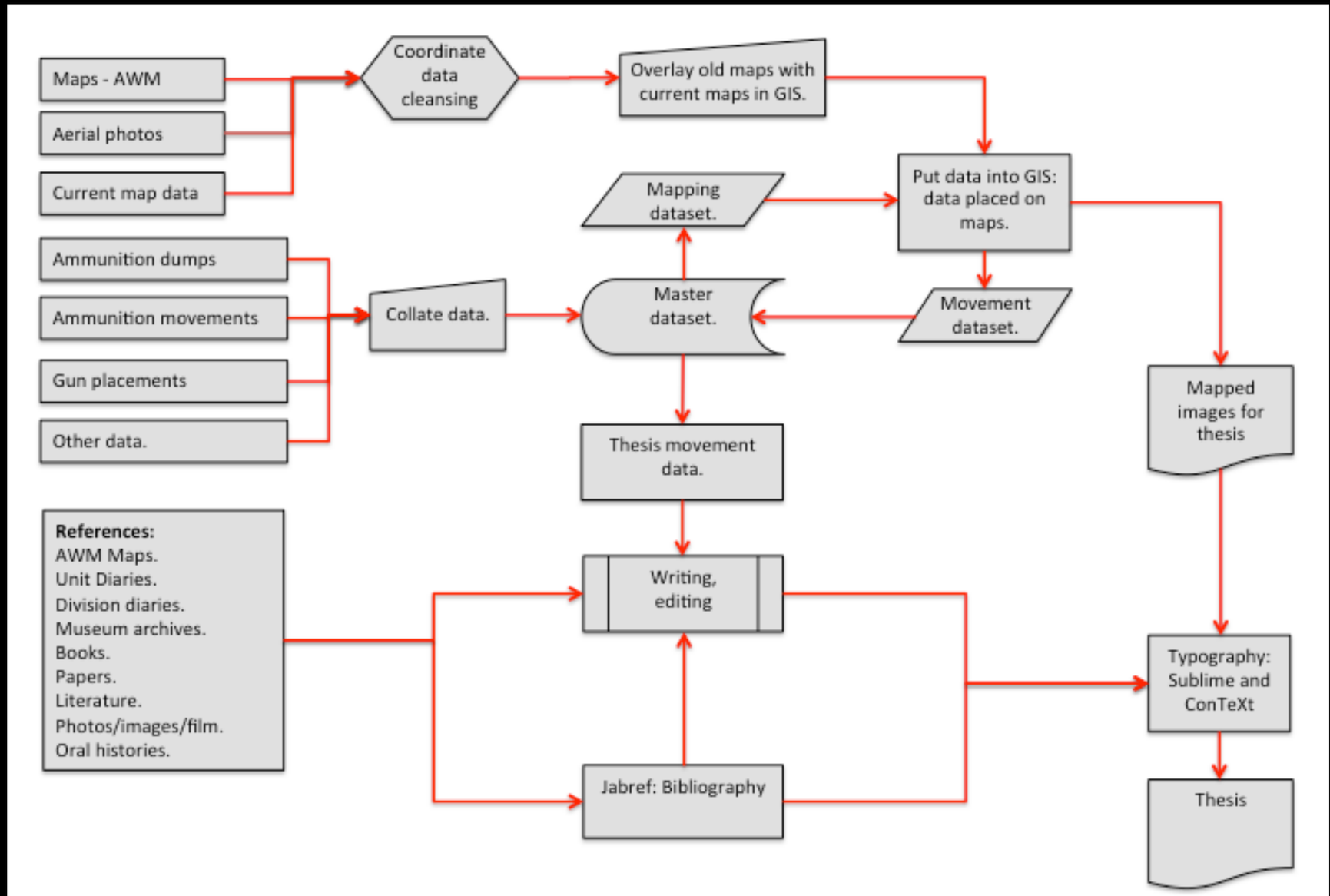
- A FAB transport serviceman's diary,
- A database compiled from disparate WWI sources,
- Geographic Information System digital mapping,
- WWI military maps overlaid on digital maps,
- Social History analysis.

This study attempts a new methodology for war studies.

I will make conclusions about WWI Field Artillery Battery logistics using men and horses for quantifiably industrial-era supply tasks.

Process

The study's overall process information work-flow.



Background

This study is utilising digital mapping technologies recently used in archaeological studies. This study applies mapping technologies to movements and logistics of WWI FAB. This is new.

Geomapping technologies will be overlaid with period maps. Transport service movements and routes will be plotted, and war materiel transportation analysed.

A new viewpoint of the role transport services played in the victory will be explored.

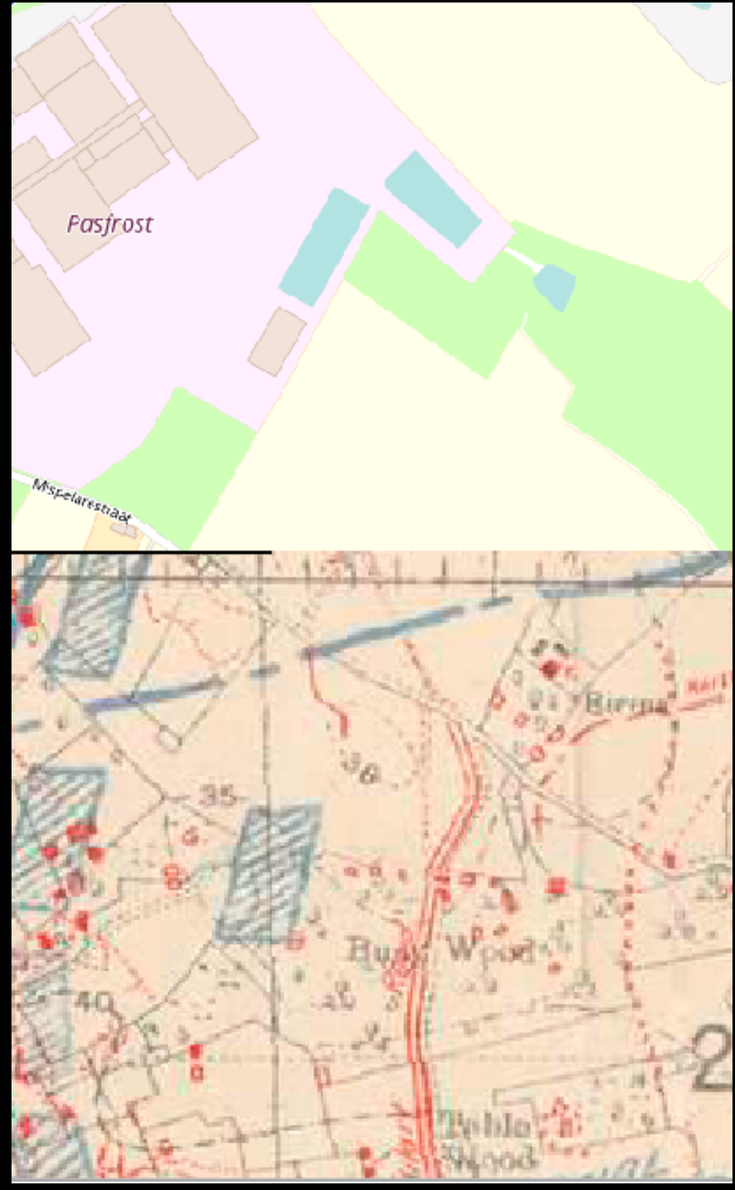
Further, the experience of one serviceman against the plans of high commands will be explored.

This is an interdisciplinary study. Marc Bloch highlighted that inter disciplinarian works like Durkheim's philosophy and Vidal de la Bloche's geography left indelible marks on historiography[2].

Now, incorporating principles of geo-mapping with WWI historiography and social histories opens a new way of looking at war which is a logical and rational approach to furthering our knowledge of WWI.

This Proof of Concept

- Showed that disparate primary resources data about Australian WWI FAB logistics exists.
- Proved the primary source data can still be linked to WWI military maps.
- Shows WWI period maps can be overlaid onto modern digital maps in a Geographic Information System (GIS) software package.
- Found that primary resource logistic data can be used to plot WWI FAB transport movements.
- Shows the experiences of a WWI FAB transport serviceman's work can be contrasted with the plans made by high commands.
- Tested and confirmed a range of technologies will work with this study methodology.
- Demonstrates the proposed process flow will be effective for this project.

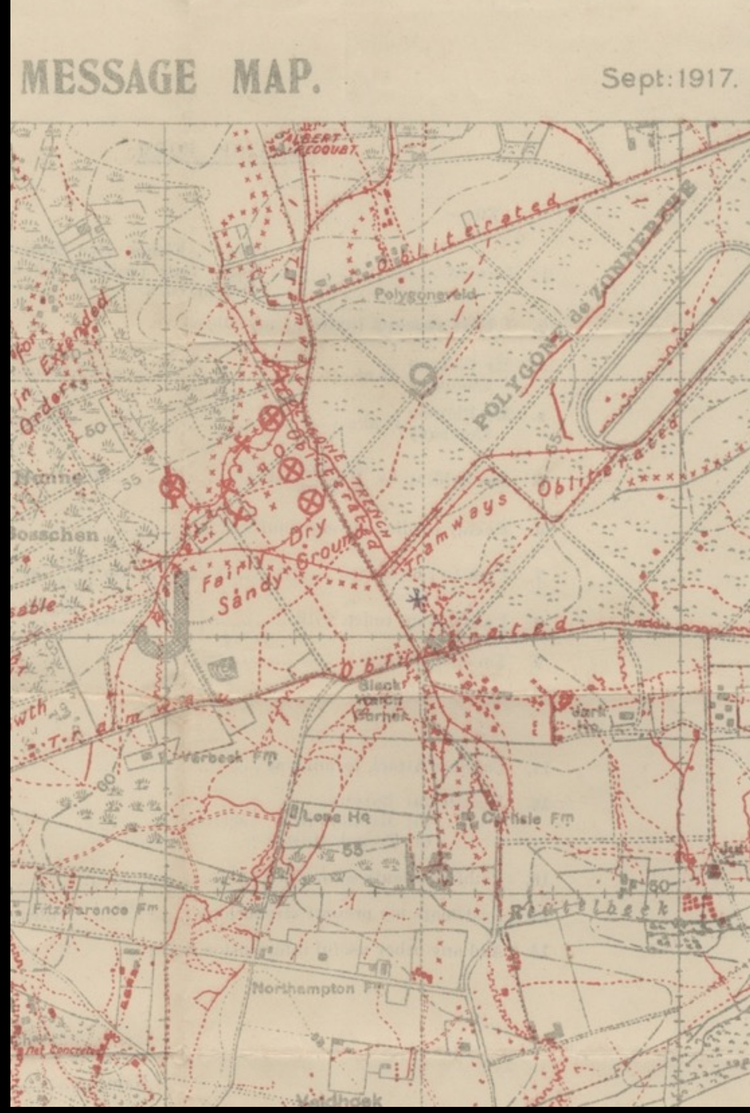


A portion of a WWI situation map overlaid onto a digital map.

Scoping

For this project to be successful I had to make sure that:

- Logistics information about Australian Field Artillery Batteries was available.
- WWI maps appropriate to this study were available.
- I understood Geographic Information Systems principles.
- WWI maps could be overlaid onto GIS digital maps accurately.
- A data model could be made for the primary sources, WWI maps, the GIS mapping (spatial) data database.
- A referencing software package could cover the breadth of my technological and historiographical referencing.
- I obtained new typesetting skills using ConTeXT.
- My process flow and technology choices were effective.



A portion of a WWI Message Map, from September 1917 (Australian War Memorial).

Elaboration

Primary Sources.

Suitable WWI Maps.

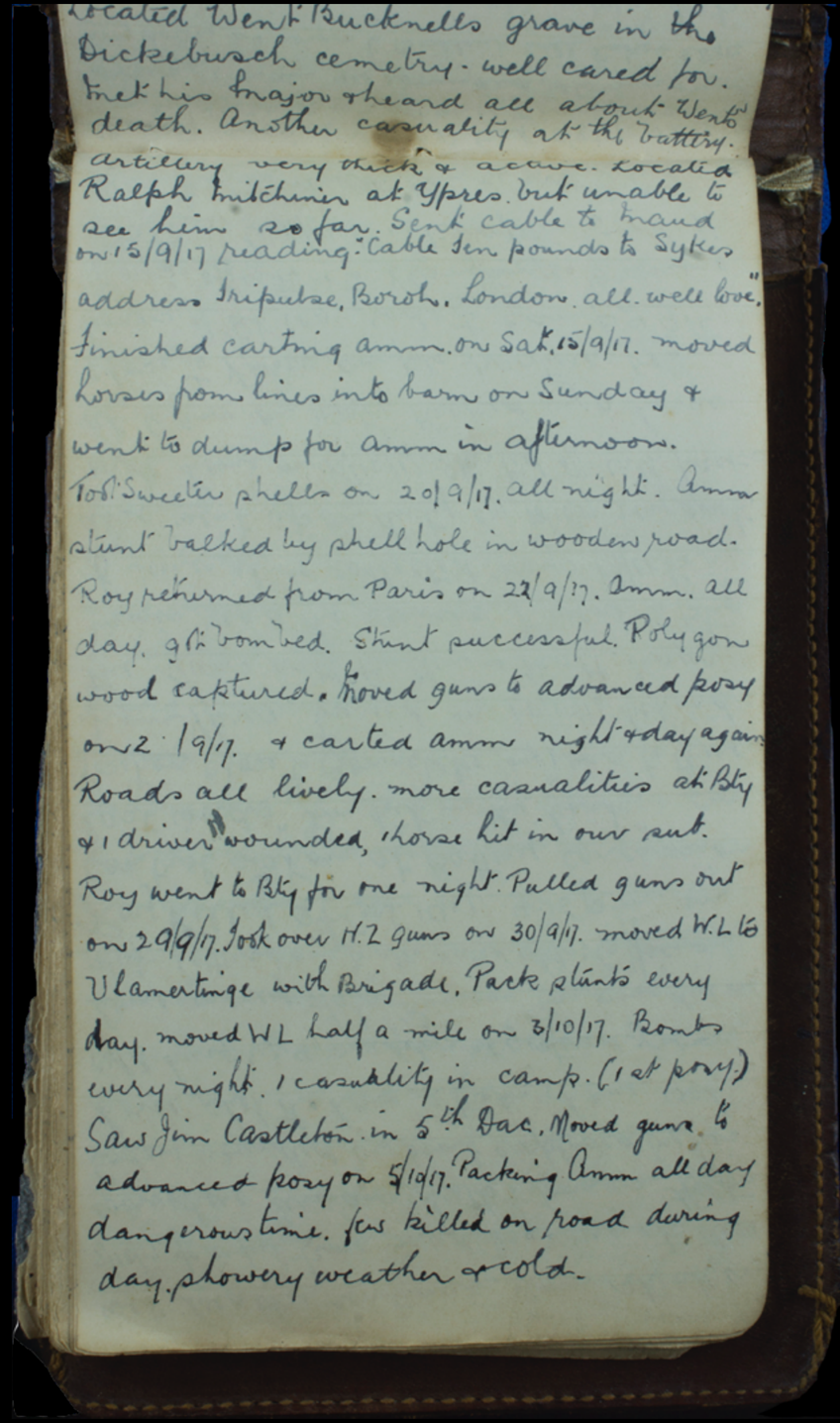
Learning GIS principles.

Overlaying WWI Maps.

The data model.

Referencing using JabRef.

ConTeXT typesetting.


located Went's Bucknells grave in the Dickebusch cemetry. well cared for. met his major & heard all about Went's death. Another casualty at the battery. artillery very quick & active. located Ralph Hitchiner at Ypres. but unable to see him so far. Sent cable to hand on 15/9/17 reading: Cable ten pounds to Sykes address Tripulse, Borough. London. all well love." finished carting amm. on Sat. 15/9/17. moved horses from lines into barn on Sunday & went to dump for amm in afternoon. Tob'l Sweetie shells on 20/9/17. all night. Amm stunt walked by shell hole in wooden road. Roy returned from Paris on 22/9/17. Amm. all day. 9th bombed. Stunt successful. Polygon wood captured. Moved guns to advanced posy on 2/9/17. & carted amm night & day again. Roads all lively. more casualities at Bty & 1 driver wounded, 1 horse hit in our sect. Roy went to Bty for one night. Pulled guns out on 29/9/17. took over H.2 guns on 30/9/17. moved W.L to Ulamertinge with Brigade. Packs stunts every day. moved WL half a mile on 3/10/17. Bombs every night. 1 casualty in camp. (1st posy) Saw Jim Castleton. in 5th Dac. Moved guns to advanced posy on 5/10/17. Packing Amm all day dangerous time. few killed on road during day. showery weather & cold.

Extract from Private (driver) Alfred James Lewington' war diary.

Primary Sources

Primary Sources were found at the Australian War Memorial.

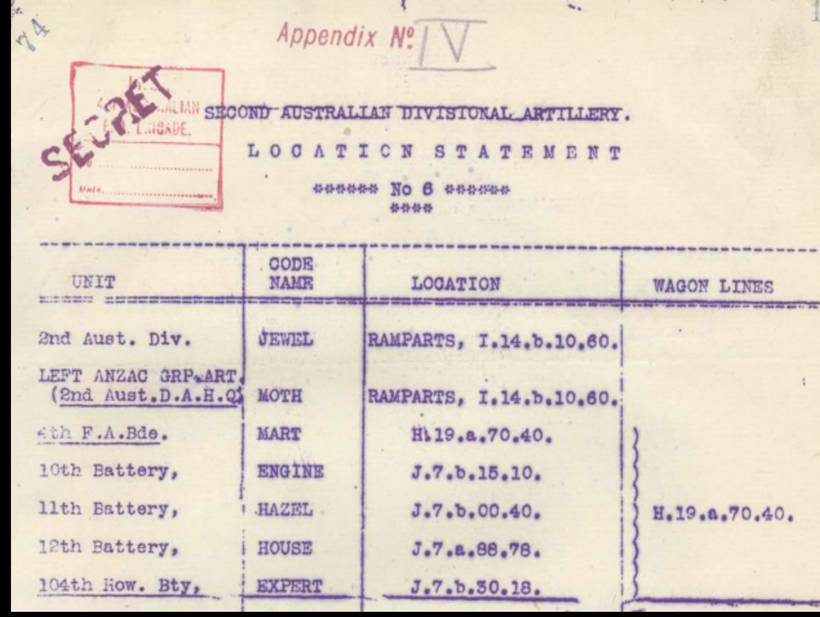
The proof of Concept document chosen was:

RCDIG1014546: AWM4 Australian Imperial Force unit war diaries, 1914-18 War; Artillery.

Item Number: 13/32.19;

Title: Headquarters, 4th Australian Field Artillery Brigade; October 1917.

Pages and file notes of this file were extracted and made. They are located on this GitHub link.



Appendix Nº IV

SECRET

SECOND AUSTRALIAN DIVISIONAL ARTILLERY.

LOCATION STATEMENT

****** No 6 ******

****

UNIT	CODE NAME	LOCATION	WAGON LINES
2nd Aust. Div.	JEWEL	RAMPARTS, I.14.b.10.60.	
LEFT ANZAC GRP. ART. (2nd Aust.D.A.H.Q.)	MOTH	RAMPARTS, I.14.b.10.60.	
4th F.A.Bde.	MART	H.19.a.70.40.	
10th Battery,	ENGINE	J.7.b.15.10.	
11th Battery,	HAZEL	J.7.b.00.40.	H.19.a.70.40.
12th Battery,	HOUSE	J.7.a.88.78.	
104th How. Bty,	EXPERT	J.7.b.30.18.	

Close reading and analysis of this unit diary found the following data:

- Ammunition firing rates.
- Map grid coordinates related to artillery.
- Transport related grid coordinates.
- Artillery movements.
- Communications related to logistics.
- Other information to assist with the social history.

… presence and absence from the archive are signs we must interpret in order to understand how they fit into the larger landscape[3]. Arlette Farge.

Suitable WWI Maps.

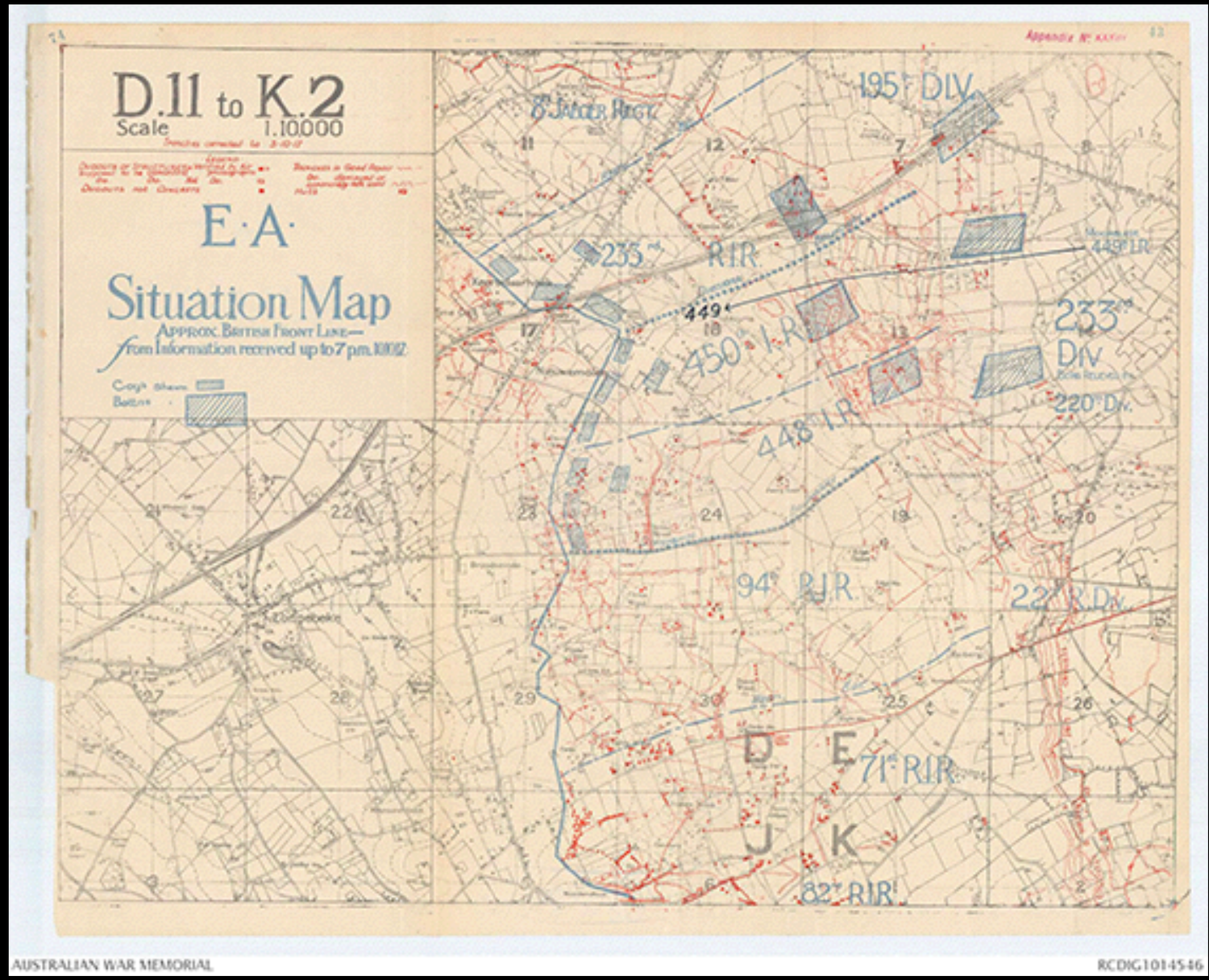
Within the unit diary were located maps that were highly detailed, could be extracted, and prepared for overlay onto a digital map in a geographic information system software package.

I had to research and learn about which map projection British (hence Australian) military cartographers WWI used.

This is amazing …

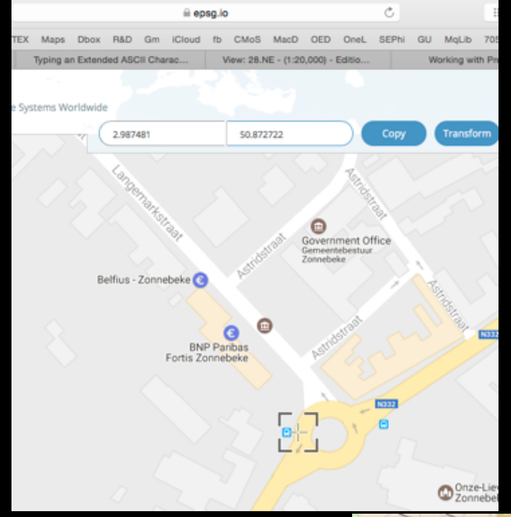
The Bonne projection was used.

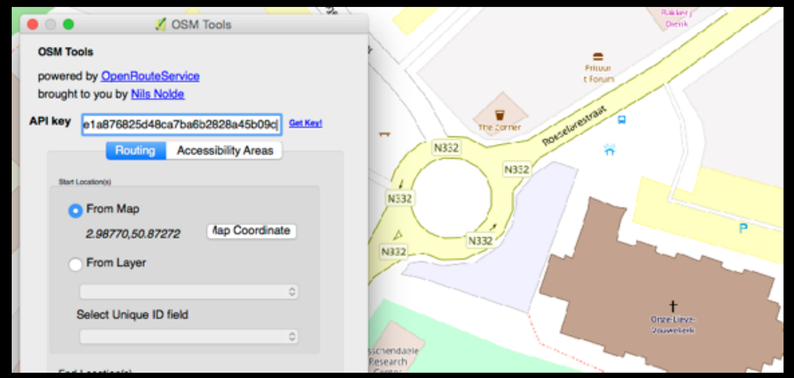
It is an ancient Belgian projection first used in the 16th Century!

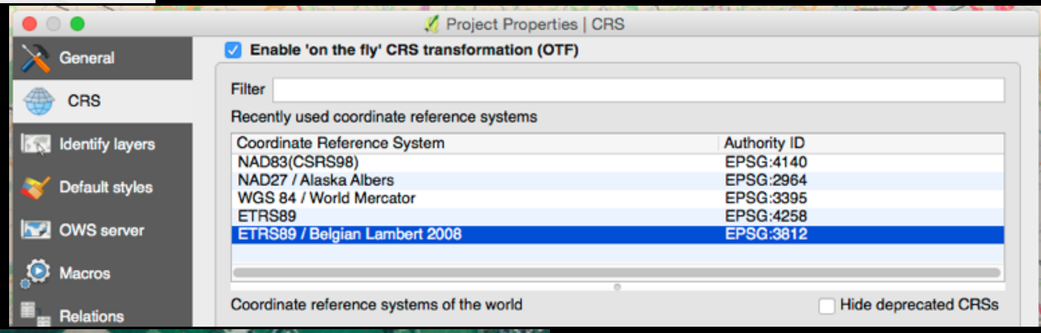


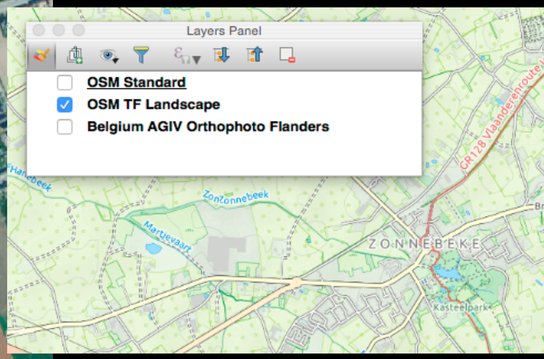
Learning GIS

- I compiled a GIS principles reference file using ConTeXT and stored it on GitHub.
- I installed QGIS (Quantum) GIS – an open source geographic information system software package.
- I learnt to install a digital map of the world into a QGIS project file.
  - Getting Started Exercise
  - Install or add a map to QGIS
  - Adding maps to QGIS: OpenLayers Plug in
- I obtained knowledge about Coordinate Reference Systems.



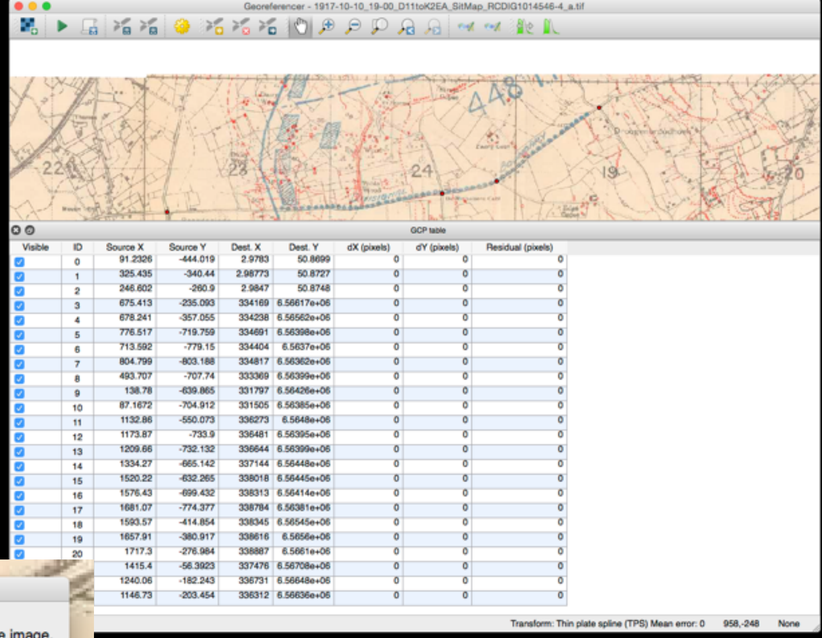




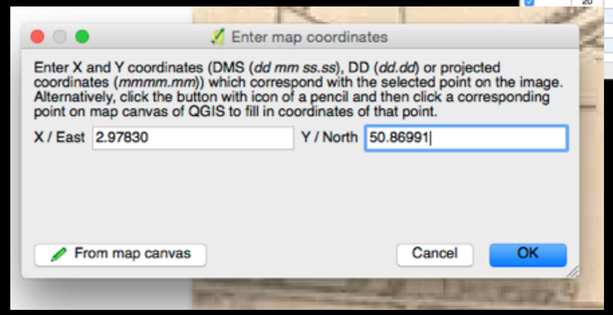


Overlaying WWI Maps

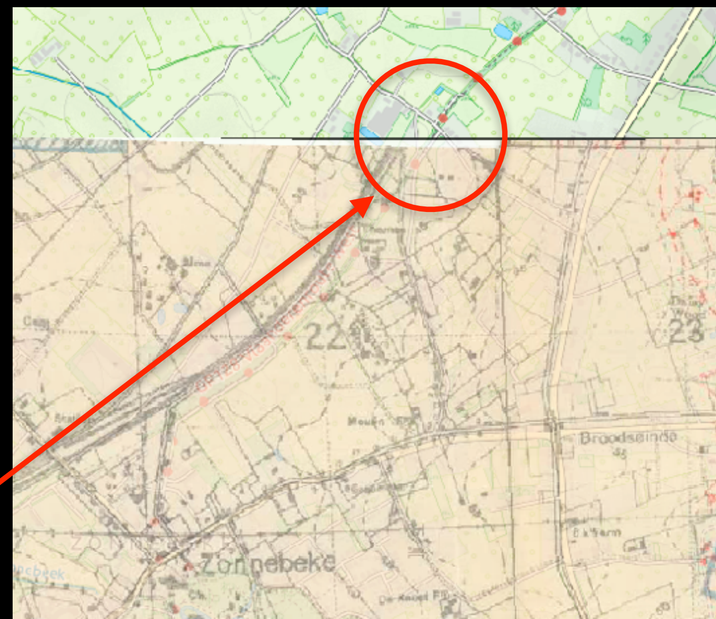
- I had to prepare a WWI map as a “Raster” file for overlaying onto a QGIS digital map.
- I had to learn and carry out the process to overlay a WWI map works:
  - Make sure the appropriate Raster CRS is used.
  - Make sure the correct CRS is used. with the digital map
  - Load the Raster file.
  - ‘Peg’ or locate to match landmarks on the WWI map and the QGIS project map.
  - Build a “Ground Control Point” table file and a second GCP table.
  - Make sure the overlay has worked.
  - Determine how to improve the process (Many GCPs must be used, otherwise skew errors are found - see bottom right image).



The Ground Control Point Table.



Matching map coordinates between the WWI raster map and the digital map.



The completed overlay showing georeferencing GCP mis-matches.

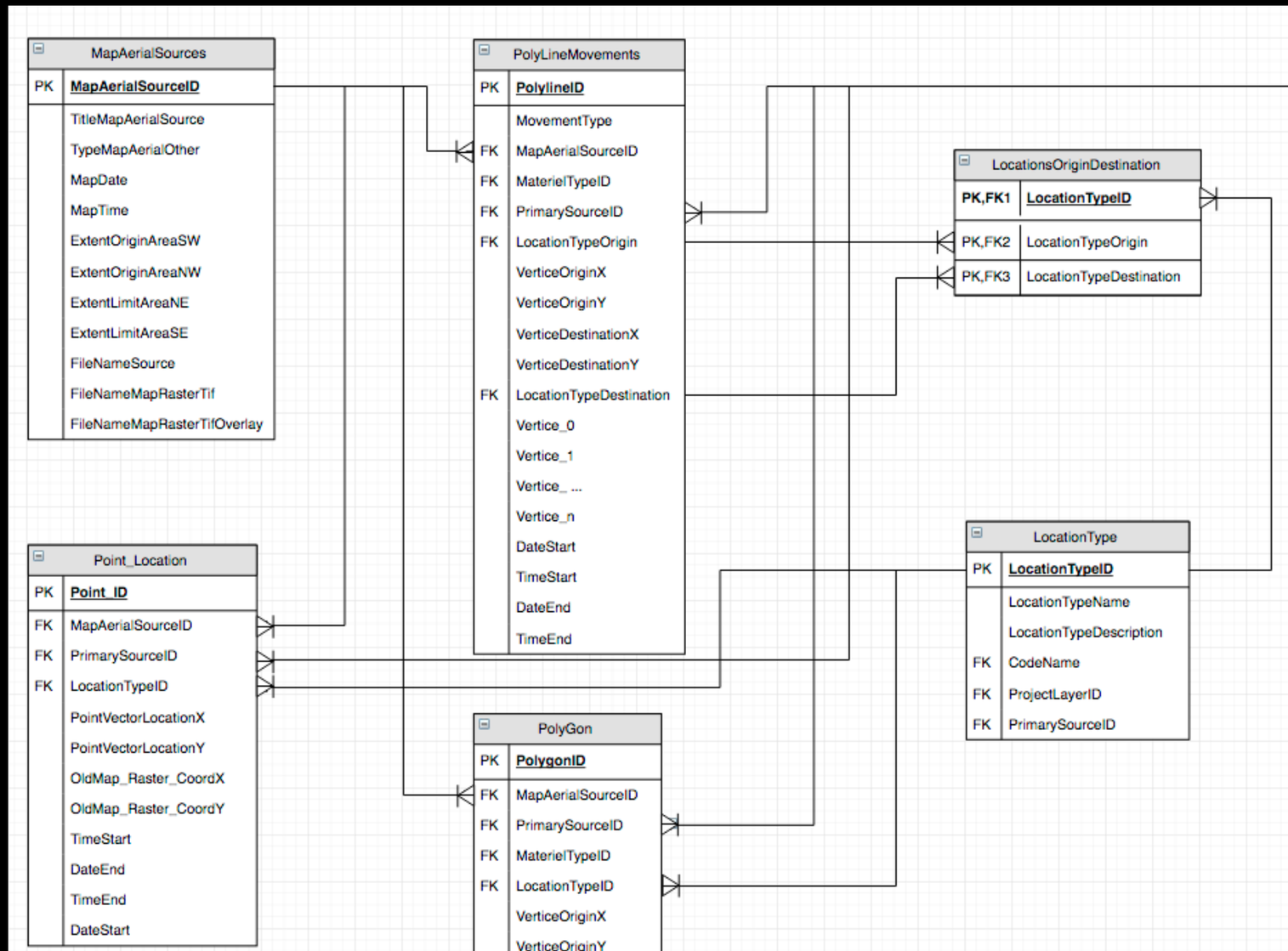
The Data Model

The data model design documents and collateral are stored on Github.

QGIS incorporates a postgresSQL module. More details about my postgressSQL work is here.

PostgresSQL is a SQL based database module which is ideal for this type of dataset work.

It is open source, and the data can be reused, transported and stored indefinitely for other researchers to easily use.



Referencing Using JabRef

After reviewing available referencing software, JabRef was selected.

JabRef is an open source and free referencing software package which enables seamless referencing.

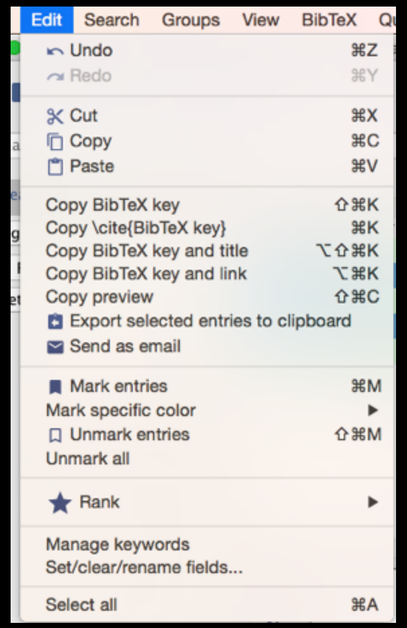
JabRef was simple to install, learn and allows you to create your own reference types according to your requirements.

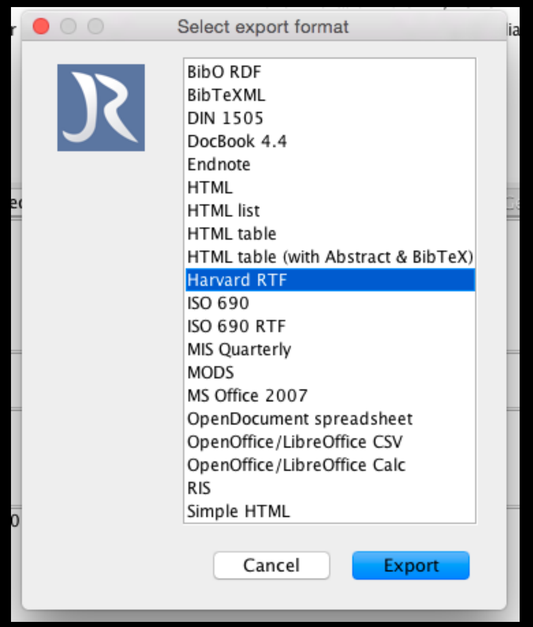
JabRef allows for working with a SQL database that is shared amongst colleagues, or is remote from the computer you are using JabRef on.

You can use JabRef with MS Word.

JabRef is designed to work to the BibTeX (pronounced Bib te'k') standard, an international standard that produces reference information in an interchangeable code.

JabRef is designed to work with ConTeXT.





Learning ConTeXT

ConTeXT (pronounced Kon Te'k') is a powerful typesetting program that was first developed in the mid 1980s. It is a mark-up language used to control and manage document production.

Compared to other desktop publishing software like MS Word, Pages and Adobe InDesign, ConTeXt is fast, and very effective.

It is available for free. Installation was a very old school command line exercise.

It also provides powerful formatting options for displaying mathematic and scientific equations, something I may require.

Using ConTeXT, I compiled a GIS Reference manual which you can find here. My ConTeXT code file can be found here for my GIS Reference Manual.

My ConTeXT code repository is here.

```
\title{GIS: An Introduction}

%   \startstandardmakeup
        \midaligned{The GIS Technical log developed for the FAB Transport Project}
        \midaligned{by}
        \midaligned{Warren Lewington}
%   \stopstandardmakeup
\startfrontmatter

\placecontent
\setuplist
[chapter]
[before=\blank,after=\blank,style=bold]

\stopfrontmatter

% headers and footers
\setupfooter[style=\it, color=blue]
\setupfootertexts[\date\hfill Dapsco Pty Ltd template]
\setuppagenumbering[location={header,right}, style=bold]

\setupbodyfont[11pt] % Default size is 12pt.

% This picks up the colour of the heading
\setuphead[section,chapter,subject][color=blue]
\setuphead[section,subject][style={normal},
  before={}, after={}]
\setuphead[chapter][style={normal}]
\setuphead[title][style={normal},
  before={\begingroup\setupbodyfont[11pt]},
  after={\leftline{ W. Lewington $\langle$\from[author-email]$\rangle$}
        \bigskip\endgroup}]
```

Results

- I found primary sources that would be suitable for this study.
- My archive searching has found suitable WWI maps.
- These maps can be prepared and overlaid onto modern digital maps.
- I have learnt the basics of GIS systems.
- WWI maps can be overlaid onto modern digital maps.
- Map preparation requires more consultation with archivist contact (Kerrie Leech and colleagues) at the Australian War Memorial.
- Setting many ground control points is essential to accurate overlays.
- The database is going to assist the project's goals.
- My project data will be reusable, and can be made easily available for further research.
- My proposed use of JabRef and ConTeXT as thesis production tools will work well.

Conclusions

- This study will present a new methodology for studying World War One.
- The technologies and process flow proposed will work as a project methodology, with elaboration lessons applied.
- It contrasts a serviceman’s real work against the plans made by the high commands.
- It extends work by Kimberley Kagan (*The Eye of Command*) and Sir John Keegan's (*The Face of Battle*).
- My study challenges traditional histories written by leaders, victors and historians, by using modern digital technologies and personal rank-and-file experiences, explores war from the common-man’s back-line service view, something rarely studied in WWI historiography.
- My study will be able to ask and answer questions about using pre-modern horse transport for industrial-quantity war materiels, something rarely explored.

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2. Bloch, Marc. (2015) *The historian's* Craft. Trans. Peter Putnam. Manchester University Press, pg. 18.
3. Farge, Arlette. (2013). The Allure of the Archives. Trans. Thomas Scott-Railton. Yale University Press, pg. 71.