

# Screen Annotation of Family History Sources

Dan R. Olsen Jr. – Computer Science Department – BYU

Much of the material found in assemblies such as the Ancestral File or the gigabytes of GEDCOM family history on the Internet have little or no supporting information. This leaves a genealogist who is following in the path of another with two options: 1) redo the work and rediscover the sources or 2) take the prior work as truth and move on. The first option is a frustrating duplication of prior labor or in the case of previous errors the fruitless search for confirmation of erroneous information. The second option is equally troublesome due to the opportunity for errors to creep into the data.

Inadequate source referencing is due to four problems: 1) in the past the cost of storing source references was prohibitive, 2) the effort required to copy and enter both the desired facts and sufficient source information to aid future researchers is tedious and time consuming, 3) any source reference is an extraction of the material and 4) summarizing all of the notes in a convenient fashion is problematic. Solutions to each of these problems will be discussed.

Our overall solution to the source reference problem is to use an annotation technology called ScreenCrayons[1]. ScreenCrayons allows the annotation of anything that appears on a computer screen. The idea is to capture the pixels of an entire screen and then allow the user to highlight relevant portions with a “digital crayon”. Such annotations are assembled together around individuals. Because annotations are simply drawing on screen captures, they apply to any digital source material. There is no application interface to which sources must conform. This mechanism allows anything at all to be annotated.

Because everything on the screen is captured, not only is the pertinent data conserved but also its context including descriptions of the source, other individuals mentioned. The important point is that a wealth of information about a source is captured and preserved with just a few seconds of effort by the user.

## ***Storing Screen Notes***

In the past source material has been discarded because of its size. However, in our experiments, the size of a screen capture is on the average 500KB. If the 36 million names in the Ancestral File had been annotated with 10 image notes (a generally excessive number) the space requirements would be 180 terabytes. At current prices this would only be \$180,000. The real size would be much smaller with each name having on the average 4-5 notes.

## Effort to create and extract source notes

Any person making a modest effort to perform reliable family history research is already consulting a variety of sources. Increasingly these sources are digital. For example, in figure 1 the user has located some information from the Pedigree Resource File and has included it in their personal genealogy. A conscientious user would use PAF's facility to identify this source and would type in the entry ID number. However, what we propose is that the user simply trigger the Crayons facility and draw a highlight around the relevant information. The crayon highlights are shown in red in figure 1. The highlighted information is what is desired for entry into PAF, but the context is so important. From figure 1 we see ID numbers, other event information, sources, notes and the original submitter.

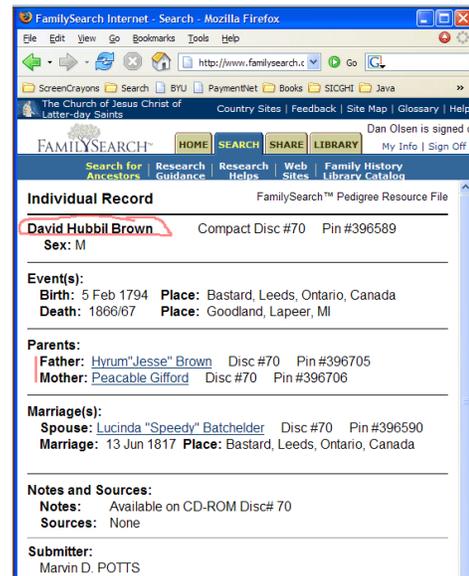


Figure 1 - Highlighting Sources

All of this information was available to the user, but very little of it will be transcribed by the user. Capturing the entire screen image with the highlights created by the user greatly simplifies the referencing process. A key contribution is that transcription errors are eliminated entirely. With a few mouse strokes a great deal of helpful information is retained. In this particular case it is now quite clear that the information the user has created is not original at all but rather a simply copy of the work of Marvin Potts. This is very important to know but is lost in most situations.

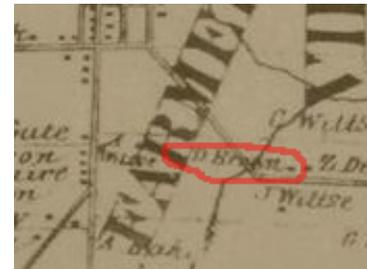


Figure 2 - Highlighting Map

In figure 2 we have identified the property of a D. Brown on a map of Bastard Township, Ontario while looking for David Brown. From the figure one can see that there is indeed a D. Brown, but most of the context information is missing. It is very difficult to understand where this information is taken from. Because we capture the entire screen, the full map is actually captured and the full information retained.

If we relied upon simple hand extraction by the user the name, township and possibly some reference to the map would be retained. However, because this note was taken with Crayons the full screen shot of the map is retained. This particular map shows several other Browns

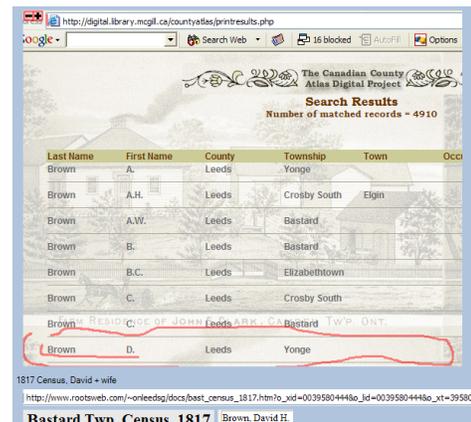


Figure 3 - Highlight text for extraction

This particular map shows several other Browns

owning property in the same neighborhood. This is helpful information when coming back to this information later.

Figure 3 shows a Crayon note of a list of names found on Canadian Maps. This information is computer generated and printed on the screen. We have implemented a prototype of Crayons that will perform character recognition on the screen image to extract text. That text can be used for a variety of purposes including automatic insertion into programs such as PAF. In our prototype the recognized names, places and years are used to automatically formulate Google searches for information relevant to the user's needs. By simply tracking all of the annotations and extracting the text we can be very helpful in finding additional online information.

### Summarizing and presenting notes

Simply creating the annotations is not enough, we need to organize and summarize the notes that we have taken. There are two problems here. The first is structuring the notes in a way that will be helpful. The second is summarizing the large images that have been collected.

Figure 4 shows a mockup of how PAF might be modified to include annotations. In this simulation every fact has a button next to it that can contain notes. We envision users having their PAF or other tool open while browsing information. Whenever they see a relevant piece of information they click the "note" button in PAF to trigger the capture and the annotation. With a click and a few mouse strokes, a direct connection is formed between genealogical conclusions and the source from which they were drawn.

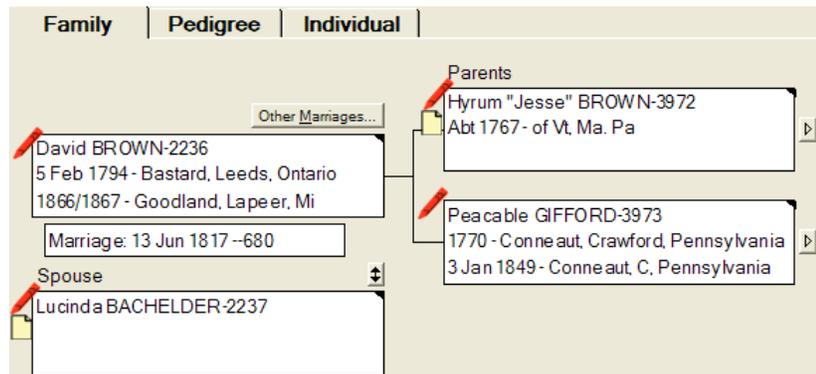


Figure 4 - PAF Mockup with note taking

Since we do not have access to the PAF source, we have implemented a separate note-organizing tool as shown in figure 5. This is simply a tree of notes organized in whatever form suits the user. This is less effective because the linkage between the notes that they conclusion the support is lost.

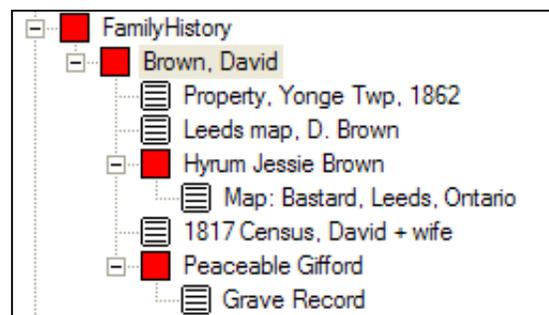


Figure 5 - Note outline tool

If every note is a full screen capture, then by definition only one note can be displayed at time. What is needed is a means for visually summarizing annotations so that the key

information can be conveniently reviewed. We also need a mechanism for easily retrieving more of the context so that we understand where the information came from. We have developed image summarization techniques that make such overview/detail examination possible. These techniques are based on annotation containment trees that lead to smoothly animated exploration of the data.

Figure 6 shows highlights on an image. Each highlight has an associated rectangle. These rectangles are formed by intelligently locating “good” boundaries associated with a highlight mark. We look at continuity regions in an image. In virtually all images there is some background that is fairly constant in tone. We find these regions and form rectangles from underlines, margin marks, scribbled highlights or a variety of other marks that a user might make. In figure 6 there are marks of various sizes that have associated rectangles of various sizes. From these we form a containment tree.



Figure 6 - Bounds of Highlights

When the highlight from figure 6 is shown in the notes, we only see the leaves of the tree as shown in figure 7. This is the key data that we wanted. The note-viewer, however, can expand the view to figure 8 and again to figure 9 showing successively more context information. With a few highlight marks the user has created a view of the data that has increasing amounts of information from a rather sparse summary.

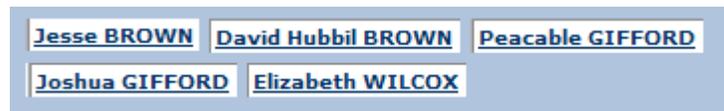


Figure 7 - Display leaf notes

## References

- Olsen, D. R., Taufer, T. , and Fails, J. A., “ScreenCrayons: Annotating Anything”, ACM Symposium on User Interface Software and Technology, UIST 04, (Oct 2004).

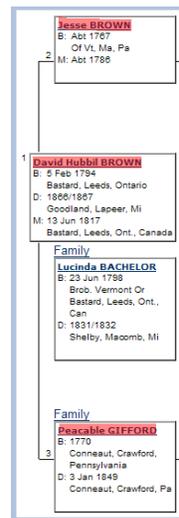


Figure 8 - Expanded Note

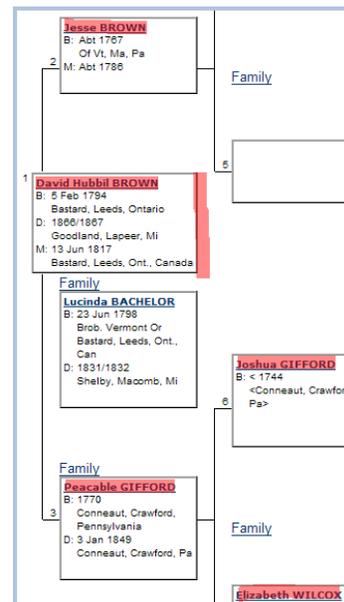


Figure 9 - Expanded again