

White Paper Report

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Eternal Flames: Living Memories of the Pacific War

White Paper to the NEH Office of Digital Humanities

Level II Digital Humanities Start-up Grant

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1. INTRODUCTION

Eternal Flames: Living Memories of the Pacific War is a “living” archive for war memories that serves as a multilingual research tool and forum for cross-cultural negotiation among war survivors, academics, private scholars and the general public. The “eternal flame” resonates as a key symbolic marker connecting a diverse set of war memorials (Arlington National Cemetery, the Hiroshima Peace Memorial Park, and the Okinawa Cornerstone of Peace, etc.). The symbol captures the ephemeral nature of the past in the immateriality of fire, the enduring significance of the past for the present, the way that the past can illuminate the present, and the responsibility of the present to remember and sustain the past. Memories of WWII in societies throughout the Pacific are constitutive of those societies in the present, both in terms of the networks of relationships in the domestic sphere as well as in the contours of the international relations of the region. Memories of events like Pearl Harbor, Nanjing or Hiroshima or of wartime conditions such as those of the comfort women or prisoners of war powerfully affect people in the present and will continue to do so even after the generation that experienced the war finally passes on. Different memories of the war are neither hermetically sealed within each society, nor necessarily in opposition from one society to another. Despite the continuing strife surrounding war memories, we believe that multiple memories of the war circulate throughout the Pacific region, across linguistic boundaries, subtly and dialogically transforming each other even as the deep networks of signification behind any particular memory remain bound to a native language field. In short, memories of WWII circulate throughout the Pacific impacting every society and being transformed as a result. Consequently *Eternal Flames* offers a new research method to capture this global process and its intersections with multiple local networks in all its complexity.

With the support of NEH in the development of *Eternal Flames*, we have made good progress on our project, and faced several challenges, over the past year. We have spent a substantial amount of time pedagogically experimenting with how students will use our site in the future (e.g. through the implementation of a password-protected MediaWiki) and in forging connections with the Computer Science Department, here on campus. Additionally, working on *Eternal Flames* has served as the springboard for several other CSPWM projects (e.g., Okinawa Peace Memorial Park project, Gail Collection, and Nagamine) which are now in their beginning stages. Together, *Eternal Flames* and these CSPWM projects, have sparked interest in the launch of a university-wide and interdisciplinary Digital Humanities Initiative on the UC Santa Cruz campus. Nevertheless, we have faced challenges in the development phase of this project. As a result, we have adjusted our expectations and refined our goals for the release of the beta version of *Eternal Flames* in August 2011.

2. PARTICIPATING INDIVIDUALS AND INSTITUTIONS

Eternal Flames project directors are Alan Christy and Alice Yang, both Associate Professors in the History Department at UC Santa Cruz. They are also co-directors of the Center for the Study of Pacific War Memories, the organization that administers the *Eternal Flames* project. They have managed the implementation and testing of early prototypes of the site as well as conducted on-going outreach to potential collaborators, especially in Japan.

Visiting Researcher Dr. Suzana Djurcilov has served as programmer, visualization advisor and technical implementation specialist of the website. She has created a fully-functional prototype and first version of the *Eternal Flames* website. With a background in Scientific Visualization and an array of previous cross-disciplinary projects under her belt, she helped us frame our requirements within the realms of computer science in general and online web presence in specific.

History graduate student Amanda Shuman helped coordinate and set up initial wiki for the classroom. The experience garnered from working with students in a real-life collaborative setting was a valuable asset in setting up realistic expectations in the final production.

3. MOTIVATION

We seek to create an enduring repository of knowledge by integrating the various aspects of online interactions of lay as well as expert audiences with a large database of images, video interviews, historical outlines and geographical maps providing the backdrop from which analysis and discussion can be emerge. Stepping away from the static presentation of historical research we wish to apply the ideals of Web 2.0 design by creating an application that facilitates interactive sharing of information, interoperability and collaboration. Participants from various walks of life are to be encouraged to actively engage in a cross-cultural, collaborative effort to bring about a varied look into the subject matter. We want our users to add their contributions in a way that their entries will be placed in a relevant space, so that they can be found in a contiguous reading of a subject, but also in tag-based, time-based and location-based searches.

4. GOALS (stated and adjusted)

When we applied for an NEH Digital Humanities Start-Up Grant, our stated goal was to focus on the development of *Eternal Flames* from a wireframe prototype into a fully-functioning website and to test that out among students in classes on the UC campus. We have successfully completed the latter, albeit using a MediaWiki instead of a fully-functional prototype. We have examined how more than 250 students in the class "Memories of WWII in the Pacific" have used a password-protected MediaWiki for object contributions and comments on numerous topics.

When we applied to NEH, we stated a bit too hopefully that our current prototype would address the language issue. Upon further reflection, including discussions with multiple computer scientists, programmers, and computational linguists on our campus, we quickly realized that the language issue could not be solved either through mechanical or one-sided translation. One problem of implementing a wiki with different language options suggested that native speakers of a particular language would not likely be able to read, comment, or participate in the discussion on a wiki in a different language. Several

solutions have since been suggested, all of which revolve around a system that would allow users to participate in the creation of a common language (visual or textual) for understanding the same object in the digital archive.

The overall goal of the site is to enable users of the site to acquire information on topics of interest to them that is available in multiple languages from more than one society. Staying within just one national memory framework, can provide a misleading sense of discursive consistency, even predictability. A strong national memory framework can take even contradictory evidence and subordinate within a relatively seamless narrative. We hope to destabilize such self-replicating narratives by using new methods to:

- 1) Encourage users to develop understandings of the transnational significance of WWII that is deeply based on evidence (the point of entry), rather than an understanding that is driven primarily by abstract ideological imperatives;
- 2) Increase the possibility of encountering unpredictable, serendipitous, yet relevant pieces of evidence and narratives;
- 3) Enhance the ability of users to encounter and then explore constellations of evidence that they might not otherwise know exist.

How might one use digital technology to enable communication across languages on topics that are often fraught with mutual misunderstanding? In our website, we are addressing this question by

- 1) Placing evidence (in the form of artifacts) at the origin point of debate;
- 2) Using evidence (in the form of artifacts) as the point of intersection of different languages;
- 3) Using crowd sourcing to create pathways between languages;
- 4) Aggregating multiple supplementary informational structures (timelines, maps, etc) to help users triangulate to new materials;
- 5) Using scientific data visualization techniques to help users simultaneously acquire a “bird’s eye view” and a ground level perspective on evidence;
- 6) Using emerging advanced capabilities for multi-lingual searching to encounter further artifacts and narrative entries.

5. IMPLEMENTATION (overall)

Eternal Flames was originally hosted on the humanities web server at UC Santa Cruz, which runs on an XServe machine with Mac OS 10.6.3, Apache 2.2.14, PHP 5.3.1 and MySQL 5.0.88. This server is a host to 21 other web-sites and as such is subject to continued maintenance, upgrade requirements and changes for a variety of needs. In the second stage of implementation, we have created a dedicated server on a MacMini server that is fully maintained, operated and serviced by our own staff.

The choice of using open-source software on a server that runs the MAMP platform has proved to be the right move. In spring of 2009, we set up a password-protected, full version of MediaWiki on our MAMP server for testing how students might use our future website (which was still just a wireframe prototype at the time). Because

MediaWiki is entirely free and currently used for Wikipedia, not to mention a plethora of sites, online support and development for this product is free, timely, and extensive.

5.1 Platform

In Summer and Fall 2009, following what we stated in our initial proposal, we installed and began using Omeka (<http://omeka.org>) as the springboard for the project development. Omeka is an open-source online publishing system fully compliant with the most recent Dublin Core Metadata Initiative standards. Developed by the Center for History and New Media at George Mason University and based on Zend, Omeka's MVC-based framework is built on PHP/MySQL. MVC (Model-View-Controller) is an architectural design pattern used on the web to separate the application logic from the input and presentation of a web-page, thus ensuring that each of the components can be independently developed, tested and maintained.

Omeka stores content in a MySQL database specifically designed for handling library content and can be populated either item-by-item or in batches.

Project Criteria and Reasons for Choosing Omeka:

- * Omeka runs entirely on the **AMP (Apache, MySQL, PHP) platform**. AMP, or in our case MAMP (M standing for Mac, the Apple OS-based implementation), is the de-facto current standard in web-design for support and interoperability.

Millions of websites and software application use the AMP platform.

- * **The vast Omeka community**, including its widespread use among historical societies and libraries, such as the New York Public Library, ensure continued development and updates to the product.

- * **Extensibility**. The availability of plugins such as Geolocation and Contribution, which allow for map-based visualization and user contributions respectively.

- * **Easy customization using Zend programming**. Zend use modular, object-oriented code. This allows for code that can be reused and easily changed in the programming process or in the future.

- * **Flexibility** Ability to re-purpose the content by building exhibits and cross-referencing via the use of tags.

- * **Scalability** limited only by the capability of the server, allowing for future growth.

- * Ability to **integrate library-style content with a multi-lingual forum**, as well as allowing for cross-referencing of both temporal and spatial data points.

- * **Support for a variety of input formats**. We currently display text, images, audio, video and DVR and are setup to allow for input and display of any documents in the Google Doc format, as well as any standard web-formatted files.

4.2 Initial Prototype and Development

Omeka provided us with a quick way to enter and organize our large volume of images and data, but we still wanted to provide a larger historical context for our work, and allow for a greater degree of interaction. We found Simile Timeline (<http://www.simile-widgets.org/timeline/>) while looking for a user-friendly way to visualize the temporality of historical facts surrounding the events of WWII and more specifically the Pacific Arena with emphasis on the Battle of Okinawa. Timeline is an open-source widget based on Javascript allowing an interactive multi-level timeline to be embedded into a web-site using minimal preparation. Besides event dates, an entry can include links, images and expanded textual information. In other words, it allows for fast and easy contextual lookup as well as placement of events. In this way, we can present the events of the war within several layers simultaneously (Okinawa Battle/War in the Pacific/Entire WWII) and link them with our database through an Omeka plugin.

Here is an example of the Timeline displaying two levels of time-span and a pop-up bubble showing additional information for an event.



During the course of our development we benefited from the work of another research group at the University of Virginia [<http://www.scholarslab.org/slab-code/omeka-timeline-plugin/>], who released a Timeline Plugin written for Omeka. This further reassured us that Omeka was the right platform choice with an active and vibrant user-group.

5.2 Omeka Prototype 1.0

Our prototype is currently running on the dedicated web-server we installed at <http://eternalflames.ucsc.edu>. We chose a MacMini with SnowLeopard Server as our platform, housing it in the Rack along with the other server in the Humanities Department. Having a machine dedicated to the web-site allowed us to shortcut many of the system administration tasks by creating a streamlined access to it. In this mode, one user can be the system administrator as well as the web-designer and programmer of the site seamlessly. This was of added importance once we realized the necessity of having to

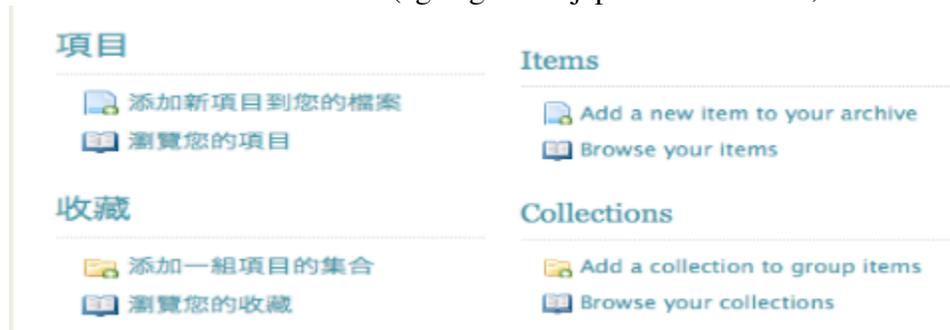
create and maintain a variety of user types to allow for fine-tuning of privileges granted to the user community. We needed roles ranging from the general public, to history students, to contributing administrators, technical administrators and lay contributors. Each group of users needed a different set of privileges pertaining to the web-site that would precisely define their roles (eg. can contribute an item but not create an exhibition, or can moderate a forum, but not edit archived items etc).

5.3 Development Issues

Language and Translation

While our long-term goal is to have a multi-faceted approach to the question of communication and collaboration across four different languages (English, Japanese, Chinese and Korean), we are yet to bring to a meaningful dialogue our contacts among language and translation experts (names?). Until we do have a clearer picture of what we can do to entice and engage our users to explore the foreign-language based portions of the site, we realize we can still provide an adequate measure by machine-translating the material. By this we mean automated page-translation and availability of the online forums in the four languages.

For this intermediate solution there is a clear and convenient option - Google translation tools, which allow users to select a language on the fly by simply using a drop-down menu at the bottom of the page. The result is a page with all of its text displayed in the selected language. In the example below, this is how a super-user from either side of the Pacific could handle the online administration of the site content in simplified chinese, versus the original page in english. By using the full-page translations users are also able to participate in multi-language discussions in our forums, by having the comments translated into their language. As we are currently set-up, the web-site's content is saved in its native english format, and translated on an per-request basis. By doing this, we are avoiding duplicating the content and storage requirements, as well as the problems encountered with compound translations when the text is put through several rounds of translations (eg english to japanese to korean, and back to english).



While machine-translation provides a springboard into foreign-language exploration, we realized that we must provide some safeguards to the correct and context-sensitive translation of the key pieces of the item display. We wanted to make sure that the content creators have the ultimate control in the key pieces of information about their items, such as the title and description of the archive content, to make sure that these fields are preserved in the original language. For this reason we provided separate fields

in each of the four languages, allowing for both the intended naming as well as the hand-translation offered by contributors.

Social/Collaborative Discussions

As stated in our initial description, our goal is to provide a meeting space for researchers and members of the community from both sides of the Pacific to engage in a debate and cross-cultural content-creation that will help illuminate the issues surrounding the events and the aftermath of World War II. For this to take place it was necessary to start with an open forum which can cross-reference the items posted in the online archive. In this manner, users can discuss specific events, or images and create a narrative outside of the scope of a pre-packaged exhibit. The basic concept we employed is to provide a fertile ground, that is, a forum that can be read and responded to in the user's native language, with the option of linking back to the items in the database for reference. To implement the forums we opted for an Omeka plugin, IntenseDebate, which adds a space at the end of the page reserved for comments. These, like the entire content of a page, can be translated using Google translate, and can hence be followed and entered in the language of choice. The forum space enhances and encourages conversation on the contents of the web-site by allowing users to add comments and ask questions. It keeps profiles of the commenters and includes options for email notification, thus providing accountability and an invitation for return visits.

Image Tagging and Placement

At the opening stages of populating the web-site our primary sources of entries were photos of the Cornerstone of Peace Memorial taken on several visits to the island of Okinawa by Alan Christy. The immediate concern with entering such items was the question of correct geographical placement and spatial context for these images. We found a solution in the implementation of a Google Maps plugin, called Geolocation. This Omeka plugin generates a Google map containing items with geolocation data and a web page for displaying the map. It allows the user to enter either an address or latitude/longitude coordinates (up to 6 decimal points in precision) or select a location from an interactive map of the area.

Editing Options

One of the reasons we used Omeka as our platform was the simplicity of online authoring. For a non-technical user, there are several options in terms of adding content to the site:

- 1) Item-by-item. This is the primary method of creating individual archive nodes, using the Dublin Core Metadata standard for description
- 2) Batch uploading, whereby items are entered into the database as a group, sharing basic metadata information as well as tags
- 3) Collections - collations of related items with no additional description
- 4) Exhibitions - a more complex option in associating related information into a web-page with additional commentary and explanation. The Exhibit pages are based on the Wordpress model, a WYSIWIG (what-you-see-is-what-you-get) system by which users with no knowledge of web-programming can put together images, video and text in a conceptualized display.

- 5) Simple Pages - this is an option for advanced users in which HTML and Javascript snippets can be integrated into a page for more involved interaction with the archive.
- 6) Image Annotation provides a way for users contributing images to select regions of the image that can be graphically annotated by choosing a rectangular portion and writing up a description. This annotation then shows up as a pop-up cloud to subsequent visitors.

3D Visualization

As part of the online presentation of the Okinawa Cornerstone of Peace Memorial we wanted the users to be able to have the visual experience of the location, terrain, buildings and monuments in a 3D setting. The idea was to allow a walk-through of the area including the visual impact of such landmarks as hills, cliffs and the circular space taken by the engraved walls at the center of the memorial complex. We proceeded by seeking out both satellite or airplane imagery of the area, along with digital topographic maps at as high of a resolution as possible. In time we were able to secure a Digital Elevation Model dataset of the area from the NASA website (<http://asterweb.jpl.nasa.gov/gdem-wist.asp>). NASA's Aster GDEM (Global Digital Elevation Model) is available to the public for research purposes at a 30-meter resolution. Soon after obtaining the dataset, we were made aware of efforts of the Google Earth team to bring the resolution of their Earth model to 15- and even 10-meter precision. Having noticed the dramatic improvement of the imagery of Okinawa Island from the time the project was started (at which point the satellite imagery over the Peace Memorial was covered in clouds), we decided to incorporate the Google Earth plugin into the site. By this time, we had already been using Google Maps for placement of on-site photographs and geographic-coordinate based data, that the extension to the 3D visualization was implemented as an alternate option to the Google Maps plugin that was already in place. Below is a Google Earth Visualization of the site at a virtual altitude of 250 meters above ground. The dark green stripe of land on the left side of the image is Mabuni Hill, the site of ferocious struggle and bombardment during the Battle of Okinawa, and clearly visible as a terrain feature while interacting with Google Earth.



6. OUTCOMES

In addition to the development of the prototype discussed above, the project director had several opportunities to present the project at scholarly conferences and invited meetings in the United States and Japan. These presentations provided both useful feedback and expanding contacts with interested potential collaborators. The presentations at the Teaching Japan conference at DePaul University in Chicago in October 2010 and the Asia Pacific University Workshop on Cultivating Students Who Can Cross International Borders, held at Yokohama National University in February 2011 proved especially productive. In addition, Christy and Yang successfully submitted an essay on how the project addresses an important problematic in contemporary American historiography to a forthcoming volume on contemporary American historiography edited by Renee Romano and Claire Potter (essay collection title to be determined).

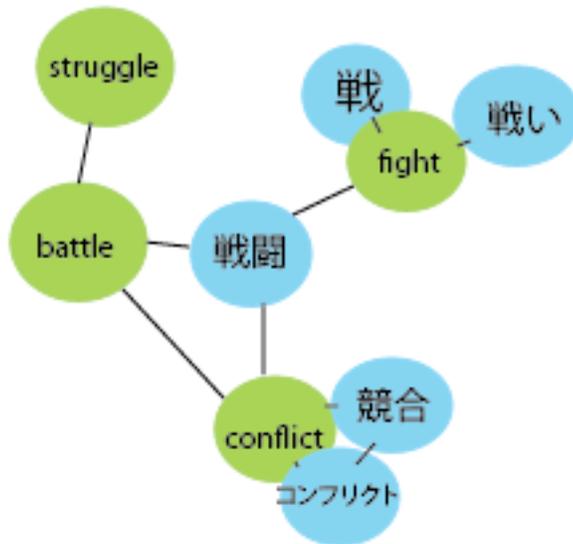
7. FUTURE PLANS

7.1 Long-term goals

We realize that the question of expert support for the language issue may remain elusive for some time. We will continue to solicit ideas for pictorial or otherwise non-text-based communication. For example, we could offer a tag cloud in different languages, manually pre-translated and verified, color-coded to match, so that users can have a visual link to the corresponding translation.

We also have an idea that would to combine two methods of information visualization into a graph representing the relationship between words that are used as tags in both the original and target (translated) language. The first is a semantic model representing correlation between synonyms in a graphical display, named Semantic Atlas model. In this system words are represented by points displayed in two-dimensional space based on how generic or specific the meaning of the word might be. In addition, words are grouped into clusters ("cliques") when they are synonymous with each other.

Our proposed model is a hybrid where the clusters and synonym relationship are calculated using the Semantic Atlas-model, but the graphical representation is produced with a force-directed layout. In our system, nodes would be words attached to other nodes as synonyms and clustered by their semantic proximity. In the interactive tool we seek to offer, the user will be able to interact by clicking on the nodes to explore the definitions, synonyms and semantic relationships of a word, and double-clicking to open up a list of items in the archive that are tagged with that word. We expect that by enticing the user to explore the interrelated meaning of tags in their native as well as the foreign language, our site visitors will be more likely be intrigued rather than daunted by the sight of a foreign-language word, and use it to further explore the content and meaning behind the tag.



To see how this would work, consider a single artifact, a rising sun flag with writing on it in the collection of the Center for the Study of Pacific War Memories. At first glance this is a Japanese object, with its meanings residing in Japan alone. The average non-Japanese speaking site visitor cannot read the writing on the flag and may not be able to see the flag as anything other than a symbol of Japanese ultranationalism. The writing that covers the white area of the flag seems to concretize American images of undifferentiated Japanese wartime fanaticism. But in this case, the artifact is available to site visitors as a donation from an American veteran who acquired it during the war. In that sense, this one item is simultaneously a Japanese artifact, originating in Japan and inscribing a Japanese perspective, and an American artifact (acquired on the battlefield and traded vigorously among troops to the rear) testifying to American desires for tangible evidence of an enemy's imminent demise. In this specific case, the fact that the flag was donated near the end of its American owner's life with hopes that it might be repatriated to the Japanese family of its original owner also speaks of an American's desire for reconciliation.

The flag will reside on the site as an archival artifact. The page dedicated to it will feature a high resolution photo of the flag, and metadata in the standards of the Dublin Core Protocols, including information on its acquisition. Next to the photo will be a set of tags describing the artifact. These tags are in multiple languages, attached to the photo by the original contributor and by users of the site with the appropriate permission level. Along with the photo and the tags will be a wiki entry, again editable by users with the appropriate permission level, written in multiple languages (English, Japanese, Korean and Chinese). The wiki entry will include information on the specific item, including transcription of the handwriting (translated for the English, Korean and Chinese wikis), information on the flag as a class of artifacts (the object, in other words, is not *sui generis*), and information, such as available, on the path of the object from its original owner to its donation to the digital archive (who had it, when and why).

At this level, site visitors can see information on the object in their own language, as well as ascertain the existence (or not) of a discussion on the object in the other languages. While we will warn the users that machine translation of text in other languages provides only a rough approximation of the content, not precise and nuanced, users will have the option of doing a quick check of the narratives available in other languages through machine translation tools. But there is an important reason for having parallel wikis in different languages organized around individual objects (rather than having the site as a whole exist in parallel sites in other languages as is the case with wikipedia). Having the entries in different languages on the same object that exist at only a one-click remove will allow multi-lingual users to assess, translate and/or certify for mono-lingual users. Upon creating new entry content, contributors themselves can also easily signal that there is a need on this page for such translation activity by clicking a button requesting translation to the other languages' entries. As with editorial commentary on Wikipedia articles, site editors can leave "needs translation" and "entry discrepancies" messages on individual artifacts, signalling to the users that information currently available is not yet equivalent across languages. Having found the flag and perused the wiki entry in their preferred language, site visitors may quickly ascertain, therefore, whether this particular artifact is connected to significant cross-cultural debates or controversies.

Our goal at this stage is to entice the visitor to use this artifact as a jumping off point for multilingual exploration. There are several ways this can happen. First, using some of the supplementary informational structures available on the site, the visitor can place the object (which in its artifactual presence is deracinated), into a number of contexts. The timeline tool will allow the visitor to play with timelines that the artifact might be associated with, locating the object to points of time that will allow other related, but possibly as-yet-unimagined materials to emerge. Placed in a wartime timeline, the flag could lead to other artifacts within the overall archive that had similar uses as the flag. When Japanese soldiers went off to war, such flags were not the only things they received from families, friends and other local supporters. There were dolls, "thousand stitch belts," photo albums, care packages and so forth. By locating the object in that wartime timeline, the user can understand the use of the flag relevant to these other objects even more precisely. Placed in another wartime (and immediate postwar timeline), the object might be situated within the American (and allied) trade in souvenirs. These might be some of the same objects as appear in the Japanese timeline, since those objects would also be available to troops stripping the dead of their possessions, but they might include other objects as well, including swords, pistols and bones. In this setting, the role that a flag could play in the psyche of an American soldier becomes clearer as well. Placed in yet another timeline, focused on the 1980s and 1990s, the flag could be related to other objects in the growing phenomena of the time of souvenir repatriation. In this case, the visitor can envision the flag's special role as an object of reconciliation (particularly because, as an inscribed object, it is easier to locate the family of the original owners of flags than most other souvenirs), and as a conduit for contact between Japanese and Americans' evolving understanding of the meaning of the war.

An object like the flag also exists in space. Using the mapping tool, users can locate the flag at several places on the map, including its place of origin, the battlefield

where it was acquired (if known), the trading site where the American owner came into possession and the location of the flag just prior to its donation or contribution (as a digital object) to the site. In the case of this particular flag, using the translation of the inscription, a site visitor can discover that the original owner of the flag probably acquired it in Seoul, Korea and that she was a nurse, a graduate of the First Seoul Women's High School, and not a male soldier. By placing that information on the map, the visitor can discover that what, at first glance, appeared to be a distinctly Japanese object, is in fact an object that is relevant to memories in Japan, the US and Korea.

These multiple contextualizations of the artifact, point a visitor toward constellations of objects and information that exist in other places within the archive and within other languages. While the core organizational structure of the site is founded on artifacts, the site also necessarily engages with discursive processes. It is much easier to encourage visitors to explore a range of artifacts on the site, as if sifting through objects in an attic. It is much more difficult to draw them into the broader discursive realms where the meanings of individual objects are created and circulated. Yet, it is important to encourage this level of exploration as well, so that visitors can assess how meaning is attributed or generated in different cultural and historical contexts. In the lingering debates over the Pacific War, there are some issues in which the data itself is still under dispute. But in most cases, it is the meaning or implications of the data that is controversial, hidden or easily misrepresented.

The website promotes multiple interpretations of an individual artifact by creating ways to quickly assess the relative intensity and content of discourse about individual objects in their multilingual wikis. Individual artifacts provide a means of entering and engaging with larger discursive processes through crowd sourcing, multilingual tags and tag clouds. For example, the flag we have described earlier can be linked through tags which are visible in all languages on all versions of the page. Consequently, a visitor reading the English wiki on the flag, can see tags in English, Japanese, Chinese and Korean for the object. Let us presume that the visitor only reads English. How can we entice her to explore the trails that lead through the site in other languages? Perhaps the tags could be arranged as rough equivalents. The English "flag" could be paired with the Japanese "hata." Our user could then click on "hata" and see what items come up. A tag cloud tool could show the visitor the other terms most commonly associated with "hata"—in Japanese, but also in the visitor's native language—allowing her to continue her exploration by clicking related items to see how the range of artifacts changes. A data visualization tool could then allow the user to visually map the trail of links she followed from one item to another, creating a kind of meaning genealogy. Alternatively, one can recognize the fact that any time you simply pair two terms from different languages, you have reduced the semantic network of each term in its native language. So the relatability of terms across languages could be visually represented by something like a tag venn diagram that shows at a glance the kinds of meaning constellations that can intersect (and diverge) across languages. The key to either approach is to take advantage of crowd-sourced input, encouraging users to not just passively explore (or lurk), but also add content, such as a tag, when appropriate.

Using a tool for multilingual searching developed by Douglas Oard at the University of Maryland, we can build on the linkages across languages made visible in the multilingual tagging by using the tags as keywords in searches that crawl through

both the site and the broader web, locating things in target languages (say, Japanese) that differ from the language of input (say, English). With Oard's tool, one can do a search using the English word "flag," designate the target language as Japanese and retrieve findings in Japanese with an astonishingly high degree of appropriateness (in other words, words in Japanese that correspond to "flag" as a noun, rather than as a verb). Oard acknowledges that this search tool, being premised on not knowing the target language (if you knew Japanese, you would not start the search with "flag," but with "hata), delivers not content information, but "finds things you cannot read."

If Oard's search delivers things you cannot read, however, its employment in the context of the site links the search to many other research elements that allow the user to actually scratch below the surface of a list of search retrievals. As a standalone, the multilingual search delivers pages of unreadable text. Linked to artifacts and parallel texts, however, the multilingual search expands or sharpens the user's efforts to understand how the terms and objects operate, or are employed, in the production of meaning in multiple cultures.

Conclusions

While the project had difficulties along the way—a long, dispiriting delay in hiring Dr. Djurcilov, the departure of Shuman to China for her dissertation fieldwork, the theft of Dr. Djurcilov's computer after months of work (fortunately, most of the work was backed-up)—the project team learned a great deal. We were able to learn valuable lessons through the use of MediaWiki in managing large numbers of students in the kinds of tasks our envisioned site was to enable. We made important advances in conceptualizing an array of methods for enabling multilingual searches, researches and collaborations and, most importantly, we were able to build a prototype that is being tested again in a UC Santa Cruz classroom in the spring of 2011 and will be tested by an international group of scholars and students in the fall of 2011.

The progress we made has clarified for us the next round of development and the grants that can most effectively help us achieve our goals, including the National Science Foundation's Social Computational Systems grant. We have strengthened working relationships with colleagues in key disciplines such as computer science, linguistics and digital media studies. These relationships are now developing collaborative grant applications which will, at the very least, allow us to continue our work without the delays we suffered under this grant.

Perhaps most importantly, the work on the *Eternal Flames* website has served as the anchor to the development of three other projects at the Center for the Study of Pacific War Memories, each of which uses the *Eternal Flames* site as a core component of its work. The Gail Project is a project to develop a collaborative transnational oral history of the early years of the American occupation of Okinawa using 200 photographs taken in Okinawa in 1953 by an American army dentist named Charles Gail. Working through the *Eternal Flames* site, the project is collecting oral history testimony of those pivotal days in Okinawa as a prelude to mounting exhibits of the photos in Okinawa, Osaka, Los Angeles, San Francisco and Seattle. The Nagamine Project is using the multilingual collaborative tools of *Eternal Flames* to engage students in Santa Cruz with students in Yokohama, Kyoto and Kagoshima to do research on Akira Nagamine, a

former Japanese soldier who survived eight harrowing years in postwar Manchuria before emigrating to Watsonville, California where he eventually built a successful nursery business. The Cornerstone of Peace Project, builds upon the multilingual user contribution framework of *Eternal Flames* to build a rich, virtual representation of the Cornerstone of Peace memorial complex in southern Okinawa, at the site of the end of the Battle of Okinawa. The virtual representation will enable visitors to explore the entire complex without having to travel there, conduct and contribute research on elements of the memorial complex and engage in «shared walks» through the complex with people in Okinawa. These projects, in turn, have won grants totaling approximately \$80,000, and the pursuit of further funding for each is currently ramping up. In addition, the positive reception to the *Eternal Flames* project, within the UC Santa Cruz campus, on other American campuses and at universities in Japan and Korea, has helped us launch a Digital Humanities Initiative in the Humanities Division at UC Santa Cruz.

In sum, while the project encountered initial trouble, the start-up grant provided by NEH has had a profound effect on our ability to produce the proposed site, to develop further successful projects and to develop a new Humanities Division initiative that is already having an impact on our colleagues.