WORCESTER'S VIRTUAL MUSEUM OF ETHNIC HEIRITAGE

An Interactive Qualifying Project

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by

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Abstract:

This paper describes the creation of Worcester's Virtual Museum of Ethnic Heritage, an online multimedia website showcasing various ethnic groups of Worcester, Massachusetts. It describes how this museum was created both in terms of the methods employed for factual research and the technical side of design and implementation of the web pages. It analyzes the possible impact of the museum on the various ethnic communities of Worcester, as well as throughout the country.

Introduction:

The purpose of this project was to create a "living, breathing" online virtual museum for the diverse ethnic groups populating Worcester, Massachusetts. This virtual museum is an interactive multimedia website showcasing online "exhibits", in the form of web pages, portraying the culture and local history of these groups. Ever since it was founded in 1722, Worcester has been a thriving, and notably diverse city. Immigrants poured into the city, bringing with them their customs, beliefs, and heritage. They built churches and banks, established credit unions, founded social and fraternal organizations, and built the city from the ground up. Now, after almost three centuries of immigration to Worcester, we pay tribute to Worcester's diversity by creating the city's first completely online museum of ethnic heritage.

Worcester's Virtual Museum of Ethnic Heritage is, to the best of our knowledge, the first of its kind. Most virtual museums on the Internet today are either the digital shadow of a real museum somewhere, or a collection of images and articles, seemingly hastily pasted together and labeled as a museum. However, there are a distinct few that reflect the effort of their authors in their quality, and provide a comprehensive outlook on the subject material that does not require outside material or prior knowledge of the subject matter in order to be understood. We set out attain this level of quality as we created Worcester's museum.

Before we began our project, there was a plethora of information regarding the history and culture of many ethnic groups in Worcester. However, this information was not nicely compiled. One would have to "get their hands dirty" and do some research. There are numerous books dealing with the history of particular peoples of Worcester. Furthermore, the Worcester Historical Museum has archives containing folders and boxes of information organized by ethnicity. However, this information is in "raw form" as it is unmethodical and unorganized. This is inherent in the definition of an archive, since it is simply a collection of various documents.

In placing the virtual museum on the World Wide Web, it offers the information in a complete and compiled form, free to anyone in the world with Internet access. Furthermore, an exhibit, though not as detailed as a book, is much more concise and it allows visitors to browse through it analogously to how one could browse through an exhibit in an actual museum. However, a virtual museum also has some of the benefits that a book offers in that it is a text-based resource, which one could use to gather information for research. Nonetheless, the virtual museum has key advantages over books since it is more widely accessible as it is available without going to the library and it offers more forms of media than just plain text.

To a new immigrant, the city of Worcester may be an intimidating place. However, if they were to browse our museum, they would learn that they are not alone. They might consider long established immigrant groups such as the Irish of Worcester, and assume that life has always been easy for their group, only to read

how things really were when they first arrived. Or, they may visit a Polish pub, unaware of the tricks once played upon this group when they were new to the city. Thus, another goal of this project is to help new immigrants to Worcester get their bearings about where they are, and what it is like to be newly arrived in Worcester. New immigrants of established ethnic groups in Worcester can use the virtual museum to find out about the history of their people in Worcester prior to their arrival, and new immigrant groups may learn from the histories of earlier groups.

The main goal of our project is to provide a service to the Worcester community by using the technology of the Internet. The virtual museum is expected to be an educational resource and tool for citizens of Worcester wishing to investigate their roots, or for any other party aspiring to gain more information about the history of the many ethnic groups of Worcester. This may include ethnic communities in other cities desiring to compare their histories to their counterparts in Worcester. Placing the museum online connects anyone in the world to the information presented through modern Internet technology.

The next chapter describes the systematic process which we used to create the museum. There are two clearly distinct main tasks to accomplish this construction: 1.) The research, and 2.) The creation of the website. These mark the two main sections of this chapter.

Methodology

Part I: Research

The main goal of our research was to provide the factual basis on which to construct each exhibit of the museum. Furthermore, the research was aimed to involve the interaction with several ethnic groups in Worcester in order to add an interactive dimension to each exhibit. Due to feasibility issues, we could only hope that our final product be a prototype for a completed product; it would have been impossible for us to include every ethnic group present in Worcester. Accordingly, we gave careful and systematic consideration as to whom we showcased in this museum.

The first stage of our research was what we call Preliminary Research. During this stage we gathered information, including brief outlines of history, for as many ethnic groups in Worcester as possible. This information was used both to determine which ethnicities to represent, and to serve as a starting point for the Main Research stage.

During the second stage of our research, the Main Research stage, we gathered and compiled all of the information which was to be presented for each exhibit of the museum. The bulk of this information was gathered from a large range of text-based resources of various media formats. This information was often complemented by interviews conducted with representatives of each chosen ethnic group. The information obtained during the interviews, in addition to

factually complimenting and polishing the rough edges of our text-based research with additional details, allowed each exhibit to have a more personal feel to it than would a mere list of facts.

A. Preliminary Research

During the first term of our project, we conducted the preliminary research. This task was two-fold: to obtain background information, including a succinct history of several ethnic groups in Worcester, and from this research, select which of these groups to showcase in our final project. After the preliminary research, we decided to narrow our scope to seven primary groups: the Irish, Lithuanians, Jews, Swedes, African-Americans, Hispanics, and Poles. We based this decision on three primary criteria: the amount of available information on each group, their relative population size, and the existence of representative organizations.

The main goal of our preliminary research was to obtain a brief history of the many ethnic groups of Worcester. To start, we read many general historical documents to see which groups these works encompassed. This, in correlation with U.S. census data (www.census.gov), provided us with a starting list of groups on which to conduct research.

Most of this information was found in materials available in the WPI library. The book "The History of Worcester and Its People" by Charles Nutt proved particularly useful as it covered a broad range of ethnic groups and

provided a stable foundation on which to conduct further research, although it was published in 1919. Using this reference as a center point facilitated the comparison between similarities and differences of the various ethnicities.

For instance, one important similarity between most ethnic groups of Worcester is that they were united in a common religion. This often served both as cornerstone for their local culture and a focal point for their local communities. This is particularly true for the Lithuanians, who were 95% Catholic, and of course it was true for such groups as the Jews. Furthermore, many distinct groups shared a common religion which prompted relations in their respective immigrant communities in Worcester. Because of its broad scope, the book by Nutt, allowed us to see how many of the ethnicities interacted.

Two groups for which we found a surprisingly unfortunate dearth of information during our preliminary research were the African-Americans and the Hispanics. One reason for this lacking was that they are two generalized groups composed of peoples of many different nations. However, we still chose these two groups as ethnicities to showcase in our final project for two main reasons:

1.) These groups in particular have not homogenized to the same degree as most other ethnic groups in Worcester. That is, they have maintained noticeably distinct cultures and each possess clear racial differences.

2.) They constitute two ethnicities still actively developing their distinct identities within the city.

Because of the latter reason, there is a wealth of current information as new events are constantly occurring. For instance, but as a special case, presently there has been a large influx of immigrants from West Africa into Worcester.

For the remaining groups that we chose, there was a large amount of information available. The Irish, in particular, historically not only played a prominent role in the development of the city of Worcester, but also set the stage for several other groups. For instance, one of the neighborhoods initially settled by the Irish was Water Street. However, as time went on and the Irish moved to different areas, this quarter was reinhabited by the Jews.

Furthermore, we found that many local representative organizations existed for these ethnicities. The existence of such organizations may be thought of as a reflection of the amount of active interest in a groups' history and culture and a measure of their activity. In other words, a nationality with many social clubs or historical societies will be more likely to collaborate in the research part of the project. This is because the existence of such organizations is evidence of the faction's own interest in the preservation of their history and culture- a major goal of our project. These criteria proved to be reliable. In fact, as we progressed, members of our initial groups heard of our work and sought us out to make sure that they were being properly represented, thus proving their interest.

B. Main Research

The most important resource for our project was undoubtedly the Worcester Historical Museum. It was here that the bulk of our most extensive research was conducted. For each primary group, we were given boxes catacombed with newspaper articles, books, pamphlets, and research papers. From these materials, we chose certain articles and elements to use as research resources and incorporated the information they contained into our project, based on their scope and relevance. For example, if there were a research paper on the involvement of the African-Americans in the building of the Blackstone Canal, this would prove less useful than a document on their general history during the nineteenth century, since the scope of the former is too sharp in comparison to the scale of our project. We specifically made choices based upon what information would best complement our previously conducted preliminary research. For groups for which we were able to summarize a rough outline of their history during our preliminary research, we knew for what particular events to attain more details. We also attempted, whenever possible, to use sources of various different media, such as picture and audio, in order to create a well rounded core for our research material.

1). Interviews

The second most important research source for our project was the interview process. Each interview was multi-purposed.

The first purpose was to add supplementary detail to the less documented time periods and events. As thoroughly and well documented as the history of a particular event may be, there are always details and personal accounts that are not attained. However, these accounts are traditionally passed down within the particular cultures that they affected, and sometimes these accounts are available first hand through interviews.

The second purpose of the interview was to add a human element to the project. The human dimension of the interview allowed for both greater depth and for instances and events in history to be seen through a more personal viewpoint. For instance, reading about Soviet oppression and hearing firsthand accounts of it are two different things. Though investigative research may supply one with the facts, one may supplement this with personal accounts for a better understanding of what the event was actually like for the people involved in it.

a). Interview Techniques

Before we could conduct any interviews, we had to decide on our interview techniques. Our primary resource for this was the Interview chapter in the "IQP handbook" on WPI's website. One possible technique was that of an in-depth qualitative interview method. This method involves changing later

questions in light of responses to earlier questions. It is conducted mostly in the form of a conversation. The purpose of this method is for the researcher to discover the experiences of the participant and the personal conclusions he or she has drawn from them. Another possible interview technique was that of the standardized interview. For this method, the interviewer has a list of questions, which is the same for each participant, from which they will not deviate. The questions are usually all fairly simple and have brief, straightforward answers.

We chose a "modified" in-depth qualitative interview method for our interviews, since each group had different aspects and points of interest. Each interview conducted was different, as the information needed for each group differed. The particular criteria for each interview were carefully chosen.

Unlike a traditional in-depth qualitative interview process, for each interview we had a list of specific questions that we wanted answered, from which we would not deviate. This made the process somewhat similar to a standardized interview process, except these questions were different for each participant. To attain these questions, we would read what we had written as a result of our research for the particular group. Then we would ask:

1.) "What in this, if anything, is unclear?"

2.) "Which subjects in this document should be elaborated with further detail?"

3.) "If I were a visitor to this website, what questions might I have after reading this?"

As a general rule, we would try to determine what additional information would make the exhibit flow better and or improve its quality and clarity. There were two main types of questions used during our interviews: There were questions about either specific details whose addition would enhance the exhibit or about specific details which were unclear, and there were questions designed to direct the subject of conversation.

In many cases, before the interview, we were aware that there were details and facts that were not present in our initial write up. The scope of these questions could be broad or narrow. For instance, one could ask for additional details about a certain event, which could have a narrow scope. However, one could also ask for a summary of the major events affecting a particular ethnic community during the second half of the nineteenth century, which has a broad scope.

In some cases, specific details that were present in our research material were also unclear. It was sometimes difficult to draw conclusions, or be sure of the conclusions drawn, based solely upon the research material because either there was a lack of details, or different sources simply had contradicting information. In these cases the questions were expected to have simple straightforward answers.

Though many of our questions asked for specific details, there were also some designed solely as starting point for a conversation. This was done in instances where we believed that more information about a particular subject would improve the quality of the exhibit, but where the information sought was in the form of a narrative. For example, for our interview with Norma Feingold about the Jews, we asked, "Can you elaborate on 'the wave of violence' against the Jews of Russia in the early 1880s?" This style of question was particularly useful for cases in which very little about a certain subject was known, such as subjects only mentioned in the research material, but not elucidated in any great detail. By this, it is not meant merely a lack of specific details, as with the aforementioned style of questions, but more purely as a lack of *general* information, e.g., the questions can be about topics that were not specifically researched, but to which references were made in the research material. The real power of this type of question is its broad scope. This facilitates the use of follow up questions to make the interview more interactive; as the interview subject tells the story, one begins to have questions related to what is said.

b). Interview Candidates

With the interview process aside, we still needed a systematic method of choosing whom to interview. Many conditions were factors in this. One of the most important of these was the knowledge of the interview candidate and their link to the particular group.

The first and most important step in this was to find out which organizations actually existed. Some of this was done during the preliminary research phase as a requisite for being chosen as a primary ethnicity of focus. To compile such a list we first searched the Internet white pages with keywords relating to the particular group. However, this proved unreliable, so we supplemented this crude list during the main research phase of our project by adding to it organizations that we found in the phone book and through Internet search engines. However, even this list proved unreliable, as many of the phone numbers were no longer in service.

With a preliminary list of existing candidates at hand, we had to determine which ones to interview. It should not be forgotten that one of the goals of our project was the *interaction* of technology with society. Thus, we wished to choose organizations that would play an active role in the exhibit for their corresponding ethnic group. Thus, we chose the initial candidate organizations as ones whose goals seemed to be related to the preservation of history or culture of their group, or, at the very least would be interested in gaining proper representation of their group in our project.

In part as a form of politeness, and in part to determine each institution's interest in our project, we sent out formal letters of introduction. In these letters we stated who we were, what our purpose was, and why we were requesting an interview. (The template used for this letter may be seen in Appendix C). We then stated that we would be contacting them shortly. However, quite unfortunately

many of these organizations turned out to either no longer exist, or to be quite frankly, quite different in nature than we expected. For instance, two of the organizations that we chose for the Polish, the Polish National Alliance Club, and the Polish Naturalization Independent Club turned out to be pubs.

However, during our research, we found much more suitable interview candidates than our preliminary list. Many of these candidates were either suggested to us by the staff of the Worcester Historical Museum, or heard about our activities *at* the museum and contacted us through it. Furthermore, as we continued our research of various ethnic groups, we discovered the existence of many organizations in our research materials and subsequently contacted them.

Part II: Creating the Museum

The Virtual Museum was the focal point of our project. In creating the online museum, we had to bring together all of the research to create each exhibit. Thus, this stabe is where all of the previous work came together. All the information obtained during the research stage, be it from an article, an interview, or a book, was uploaded onto the site. However, the creation of the museum encompassed much more than just this and was a complex process. Before any information could be posted on the site, the site had to have a basic layout. This had to be planned out both in terms of aesthetics- a front end issue, and data structure- a back end issue. The visitors to the museum can see all the changes made on the front end, e.g., if we add new pictures to the site they can see them. However, they cannot see how the files for the site (HTML files, pictures, audio files etc.) are organized, and this file structure is called the back end. Running a

website requires some degree of planning ahead of time, and maintaining one requires the skills to adapt to a changing digital environment.

A. Background

The first step in designing a virtual museum was to research exactly what one was, and how it worked. Mainly, we wanted to find, analyze, and compare and contrast some existing virtual museums to decide upon an optimal design. For this, we ran a Google.com search for virtual museums, since all virtual museums are on the web. Of the numerous sites at which we looked, the ones that we deemed "good" had several traits in common:

Little to no wasted page space.

Organized information.

Aesthetic appeal.

Ease of use.

Simplicity.

Analogously to an actual museum, empty or wasted space slows a guest's navigation. In several poor examples of virtual museums that we found, the information seemed to be spread all over the website in a random fashion. This was deemed undesirable since, just as in a real museum, visitors should not have to search for information; it should be easily and plainly accessible. Further deepening the analogy, a real life museum which is in a run down building with paint pealing off the walls will probably not gain many visitors, and those it gains

will not be very impressed; similarly for an aesthetically unappealing virtual museum. Conversely, a website with cutting-edge graphics and multimedia will catch a visitor's eye.

The last two criteria, ease of use and simplicity, are more specific to the virtual terrain of computers. We compare our museum, for these two traits, to a computer program. It has been the trend for programs, and specifically operating systems, during recent years to become more "user friendly". This means that programs should be easy to use, and easy to learn to use. Even if a program is effective in accomplishing the task for which it was designed, the modern day computer user does not necessarily have the patience to learn how to implement it; it is really only the task in which the user is interested. Similarly, a visitor of a virtual museum is after the information contained in it, not in learning how to navigate through a foreign website. Even if the way in which a computer program is used is easy to learn, if the procedure is still tedious or complicated, many users will be deterred. The same is true for a virtual museum. Visitors want the information quickly, easily, and efficiently.

B. Design

1.) Visual Layout and User Interface

With our basic criteria well established, we began the visual design for our museum. The first consideration was exactly *how* the interface would look and operate.

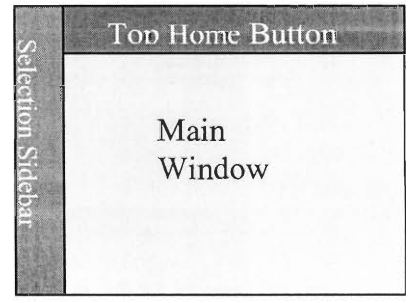
When a user logged onto the site, we wanted them to be able to immediately navigate to whichever exhibit they wish, with slow loading times.

We also wanted to make sure the user was properly "greeted". That is, that they were told what the museum was about and how to explore it. Accordingly, we decided to include an "intro" page, similar to a lobby in a real museum, but with the links to each exhibit readily accessible.

The layout is the most important factor in a webpage's organization and ease of use, so we made sure that it would behave in a familiar and uncomplicated manner. To do this, we considered many different possible layouts for the site. Some of them involved a selection bar on the top or side, while some would have more unusual systems of navigation, such as a right-click menu or a pseudo-3D navigation system.

What we ended up deciding upon was a selection bar on the left, a title bar on the top, and the main exhibits in the middle. Although this is not as lavish as the drop down menus or a pseudo-3D interface, the average user's web browser and connection can handle it better, and there is no learning curve as to how to navigate the site. We decided to include a title or "Home" button on the top left of the screen, which would link the visitor back to the "main lobby" page. With this, even the most confused user can just click on the large text on the top, and get back to the "intro" page.

More specifically, we decided for the layout to work like this: The top and left sides were set to stay at a constant size, since they do not benefit from larger window sizes. However, if one is to open the page in his or her browser and resize the window, it will automatically change the



size of the main window to fit the browser. This also optimizes the page for *all* screen resolutions, which is very important since the page should be optimal for *all* guests, and each of these guests may be running different monitor resolutions.

2.) Data Structure and Web Page Encoding

The entire site was coded in simple HTML (Hyper Text Markup Language). This was done for many reasons. One reason was that HTML tends to load rather quickly as compared to PERL, Java, and Flash based encoding. Also, HTML is much easier to learn than these, and thus the webpage could be coded much more quickly using HTML. Though, the other options offer a more user-interactive environment, they tend to work against our goal of simplicity of design. They also make a website harder to maintain and open up more possibilities for coding errors (not to mention technical details about file permissions).

HTML is typically the standard for basic web page encoding. PERL programs typically deal with database management. Since our users need not add information to the site, but only retrieve it, adding a database server such as a PHP (PHP Hypertext Preprocessor) administrated MySQL server would be excessive. The concept of simplicity of design applies not only to user interface, but also extends to back end structure. It is not a very uncommon occurrence for web surfers to receive error messages due to database errors while browsing a site encoded with PHP. With HTML, the information is stored simply as web pages,

which eliminates the need for a database server. Thus such errors cannot occur with HTML.

However, it would be an interesting project idea to convert the museum into a database structure, so that representative organizations of different groups could update their respective exhibits. A web page encoded with PHP to administrate a database in which was stored the information for each exhibit would be an ideal choice for such a task. A simpler solution to this might be a simple PHP script without the backend database, just allowing specific users to have upload privileges to the web space. However, this is well beyond the scope of our project because of its technical nature and possible liability issues concerning the content uploaded.

At any rate, we chose HTML as the encoding scheme for our site. There are two different ways to use HTML to create the visual layout and interface upon which we decided: Frames and Tables. Both had their own merits and we took care in deciding which one to use, as we would have to stick with it for the whole project.

"Frames" means that there is a separate page for each part of the window, all loaded onto the same screen. Each page has its own URL (Uniform Resource Locator) which can be accessed separately. Also, one can change the content of one part of the page without having to change every file. So, if we decided we wanted a different selection sidebar, we could just change its file, without needing to modify any of the individual files for the exhibits.

A table is a set of "cells", and all cells are immediately either next to, above, or under another cell. Each cell behaves almost like its own webpage, but unlike frames, the information for all the cells is saved in one file. With cells one can manipulate the placement and layout of data on a page easily and not have to deal with a large number of files. Very advanced users can also open individual parts separately or link to just the main window when opened for one group. The downside, however, is that if we were to make a change to our selection sidebar or top area, we would have to go into each page and manually update them.

We decided to use frames instead of tables. Although tables will usually work better when the entire page is planned out and more or less static, we intended for it to be constantly updated not only during the project, but afterwards as well. Frames allow that flexibility.

As an example of how frames work, every time a web browser goes to a web address, it tries to open a file called "index.html". This file is usually the "home" part of a page, or an "intro". The source for ours, at one point, looked like this:

```
1   <html>

2   <head>
3     <title>Foreign Populations in Worcester</title>
4   </head>

5   <frameset cols='120,*' framespacing=0 border=0 frameborder=0>
6     <frame name='left' src="leftside.html" scrolling=no>
7     <frame name='right' src="rightside.html" scrolling=auto>
8   </frameset>

9   </html>
```

What each part does:

1) Starts up the page's language.
2) Starts the "header". This includes general information about the page.
3) States the title to be displayed on the top bar of the browser.
4) Ends the "header".
5) Says to split the page into two sides, a left and a right. The left side *must* be 120 pixels wide. Fit the right side to everything to the right of this.
6) For the left side, use a file called "leftside.html" and do not have a scroll bar.
7) For the right side, the filename is "rightside.html" and it should determine whether or not it needs a scrollbar automatically.
8) Ends the frame section of the page.
9) Ends the page.

The left side that was created during the implementation of this is the selection bar. The file "rightside.html" contains instructions to further split into two pages, one for the top, and one for the bottom. The top is the title bar. The bottom is the main window, which takes up most of the web browser's screen, and is where each exhibit of the museum is displayed. The selection bar (the file "leftside.html") contains instructions to change the content of the main window to whichever exhibit the user clicks.

Impact Analysis:

Part I: Our Local "Museum Guests" and Their Cultural Diffusions

The main audience for our website is the residents of Worcester. However, one may ask which residents will be the most likely to visit our site and to which it is likely to prove most useful. One main category of residents that will visit the "virtual museum" is that of first or second generation immigrants. This is largely due to the fact that most ethnic groups eventually assimilate with American culture after a few generations. Furthermore, many ethnic groups, such as the Jews (Feingold), wanted to become more American after their immigration- that is, adapting their lifestyles to American culture. This means parting with certain aspects of their culture.

The remainder of this section is our theory:

For most cases, each ethnicity's culture becomes more and more "diluted" by American culture with time, in that it dissolves into the sea of the norm. With some notable exceptions, the mixture of cultures over time stabilizes as globally homogenous. Thus, new immigrant groups and newly situated immigrant families have the most distinct cultures. Regardless of the fact that many of these newcomers wish to become more American, many families think that it is important to preserve their culture in order to pass it on to their offspring. The level of interest in the preservation of a culture would seem intuitively

proportional to the current level of its presence. That is, the more pride and knowledge a family has in its culture and roots, the more likely the family is to try to preserve it. Thus, recent immigrant families should be interested in educating their children about the history of their ethnic group in Worcester. Furthermore, they may want to add to the site so it better represents their culture.

Although for the most part, the older ethnic groups and well established families of immigrants, generations back, have lost their distinctly discrete cultures and blended into the mean, this lack of clearly defined culture may prompt certain individuals and families to attempt to investigate their history. Also, for the well-established early arriving ethnic groups (such as the Irish), there is a much richer documentation of history. This is due to the accumulation of history over the years. That is, the longer an immigrant group is present, the more documented events they record. If we were to make the assumption that each ethnicity more or less experiences the same rate of cultural dilution, though as each group exists longer, its average interest in and existence of independent subculture reduces, the accretion of history of older groups should be larger. Furthermore, in modern times, the contemporary mass propagation and dispersion of American culture through the media industry and advertisements increases the rate of decay of disparity in culture. This is further evidence of the fact that the earlier settled groups have a more richly documented history of their culture.

We will now formalize this theory mathematically. As a model for this "flow of culture", consider the following mathematical axioms:

1.) Assume that the "strength of culture" is a measurable quantity.

2.) Assume the "richness in documentation" of culture and history is proportional to the accumulation of documentation with respect to time of the level of instantaneous cultural strength.

This is evident from the fact that the recording of history is an aggregative process. Graphically, this means that if one graphed the "strength of culture" versus time, then the mathematical representation of "richness in documentation" can be thought of as the area under the curve from the time the group arrived to the current time.

3.) Assume that the abstract quantity "strength of culture" can be represented as a continuous distribution.

This merely means that we are replacing the discrete problem of the "strength of culture" of individual people with a continuous distribution of people. The rationale for this is that this should model the system as the number of people in it approaches infinity. Thus, the larger the city or country to which this model is being applied, the larger its accuracy.

4.) Assume that the rate at which each culture's "strength" diminishes, increases with time as the spread of American culture through the media augments in intensity.

5.) Assume that the rate of change of "richness of historical documentation" at a certain juncture is proportional to the group's instantaneous "cultural strength".

6.) Assume that the existence of "small" inhomogeneities in local and global cultural distributions is an unstable state.

That is, we assume that eventually (over time) most ethnic groups will assimilate with the local community (other than those mentioned in axiom 8).

7.) Assume that the rate at which a culture's strength decays is inversely proportional to its current strength.

This means that if a culture is of "low strength", then it will decrease in strength more quickly than one that is of "high strength", because groups with a fervently rooted culture will be more likely to attempt to preserve it.

8.) There exists critical points in disparity between a certain faction's traditions that is noticeably distinct from the mean.

What this means is that if a certain culture is vastly different from the norm, its members will have more difficulty adapting. On one hand, if the culture is distinct enough, it may compel its respective group into isolationism, which hampers the group's assimilation. This is particularly evident in the African-American communities. African-Americans have been in Worcester since the late eighteenth century but they still have a noticeably distinct culture, which is most likely due to their racial difference from most of the other ethnic groups.

On the other hand, if the "cultural strength" and "cultural distinction" is less than this "critical value", the group will eventually assimilate.

As an example, let us look at only cultures that eventually do assimilate. If culture A arrives before culture B with the same "cultural strength", then there will be two factors contributing to the fact that culture A will have a "richer documentation" of history. Namely, the area under the curve representing "cultural strength" for culture A will be accumulated over a larger interval of

time, and the rate of decay of "cultural strength" of culture B will be higher than the rate of culture A's when it was at the same "strength". This is best seen in Figure 2:

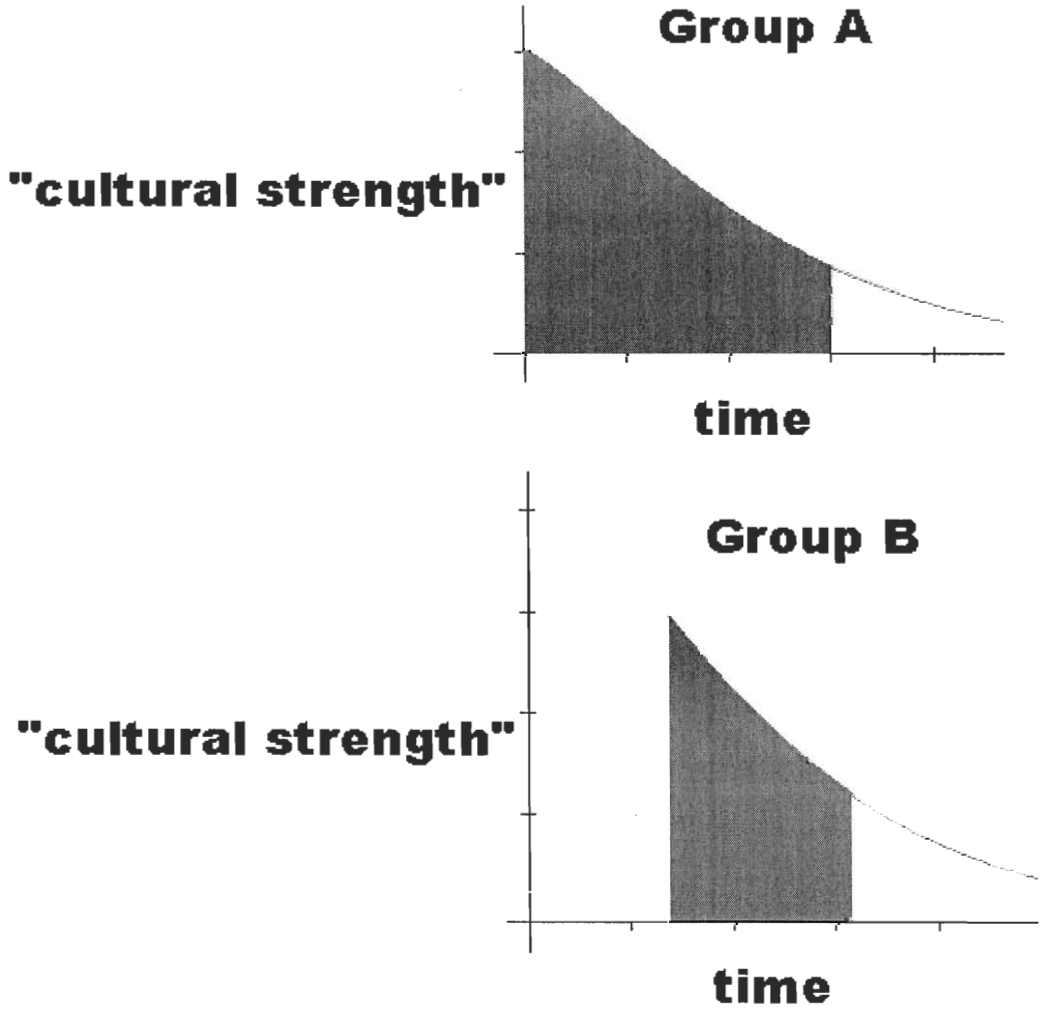


Figure 1

According to our model, the shaded area is the measurement of "richness of documentation" of each group's history. It is clear from the graphs that culture A has a much higher measurement of this.

This analysis is similar to the situation in István Kónya's paper "A dynamic model of cultural assimilation." [Kónya] This paper mathematically analyzes the dynamic system of a country with one majority and one minority in terms of their relative population. This is a model of total assimilation, in that each individual can either be characterized as a member of the majority, or the minority; members of the minority who assimilate become members of the majority. Our model is more intricate in that it allows for an individual with certain ethnic roots to be linked back to their original minority group. However, since we model only the "cultural strength" of each subculture, our model is really a statistical average over all those with roots in a particular culture. In the case of the paper, the situation could be modeled by a functional, thus its equilibrium points were the extrema of the functional, given by the Euler-Lagrange equation[1]. These equilibria in population were related to critical values in population, just as our model for equilibrium in cultural strength is related to critical values in cultural strength. This comparison is offered as evidence for, but not proof of, our conjectures.

The virtual museum is a sort of time capsule preserving the history of the subcultures that once existed in Worcester. For ethnicities in Worcester that still have a high "cultural strength", there will be a larger demand (though perhaps less of a need) for our "virtual museum". Because of their interest, this will help ensure the site's use and perhaps maintenance. Furthermore, groups that have homogenized with the rest of the Worcester community, lacking a distinct cultural

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[1] $\frac{\partial F}{\partial y} = \frac{d}{dx}\left(\frac{\partial F}{\partial y'}\right)$

identity, may use the site to find factual information about their history and culture in Worcester. The museum could be used as a tool by such a faction to revamp its "cultural strength" by promoting cultural identity and diversity. Thus our virtual museum could potentially affect the very equilibria that we have just modeled, vastly altering the social and economic culture of Worcester. However, we conjecture that in order for our site to survive and have such a deep impact, it itself must reach a certain "critical point" of public awareness and acknowledgement and this could not happen over night; it would probably take at least two years to reach this level of reputation.

Part II: Other Visitors

The target audience for our website is not restricted only to residents of the Worcester area. Any historian or student of history wishing to research the immigrant groups of Worcester may visit the site. Also, historians may be interested in using Worcester as case study to learn about how different immigrant groups interact with their local surroundings.

The website also facilitates groups of similar ethnic heritage in different cities to become more interconnected. People of a certain ethnic group may want to find out more about the history of their group in another city. For instance, a local Swedish social organization in Miami, Florida may be interested in finding out about other Swedish communities. The website offers this information for the

Swedes in Worcester. It may perhaps motivate this organization to start a similar project for the Swedes in Miami. This brings up another important point.

The project can serve as a model for similar museums for other cities. In the next section a comprehensive guide to how this can be done is discussed. Ideally, if many cities created and maintained such "virtual museums", they could interact and be linked to each other. This could strengthen the sense of heritage for the respective groups.

How to Create a Virtual Museum for a Chosen City:

Undoubtedly, the most useful resource for our project was the Worcester Historical Museum (WHM) which served as our "base of operation" for the research. Not only that, but the WHM was interested in our project from start, as they shared similar objectives with our museum. Accordingly, they link to our site, and we link to theirs (http://www.worcesterhistory.org/). It is suggested that if one wishes to create a similar "virtual museum" for another city, they try to find a local historical museum with whom to cooperate. The existence of such a museum alone indicates that there is at least an interest in general historical preservation in the target city. Furthermore, such a museum will most likely have information on the history and culture of the various ethnicities of the city. Much of this information may not be documented in history books.

Before one initiates contact with such a local historical museum, one should perform preliminary research. One should have a general "feel" for the ethnic make up of the respective city and a cursory outline of each ethnic group's history there. This way, one has a list of "main cultural groups." For an example of appropriate guidelines for the selection of these groups, see the methodology section of this paper. These are the groups for which there will be the most information, and thus are the groups whose exhibits will be easiest to construct. Once the museum is up and running with these larger groups, one can add other groups. Furthermore, the groups who are not represented will most likely contact the Webmaster of the "virtual museum" in order to be added. Also, it is important

to perform the preliminary research in order for the respective local historical museum to know that one is serious about the project.

The next stage in the creation of the museum should be the main research stage. During this period, one should gather as much pertinent information on the main groups as possible. Depending on the scope of the museum being created, one should determine the criteria for such information to be de facto "pertinent". For examples on how we made these criteria, see the methodology section of this report.

After this information is acquired, one should integrate it into a text-based museum exhibit for the ethnic group which is represents. It is recommended that one reads all of the information first in order to gain a "feel" for the "story" of the group. Then, one should attempt to organize this story. Many times chronological order is sufficient. However, there are also many instances where it is more appropriate to group events together by category. Once each exhibit is written, it is a good idea to have employees of the historical museum check it for accuracy as some sources may present conflicting information.

After each exhibit has a rough draft completed, one may wish to determine if there is any additional information that may make the exhibit "flow better". Many times this information can be attained through interviews with representatives of the particular ethnicity's community. This adds a human element to the museum, which distinguishes it from pure text-based research. The importance of this is discussed in the beginning of the interview section of the methodology chapter of this report. In further sections of this, we discuss methods for choosing interview

candidates and interview techniques. It may be a good idea to attain video or audio recordings of the interviews conducted. These increase the amount of multimedia of the site. An example procedure for the conversion of analogue audio to digital format, its editing, and how to implement it on a website, is described in Appendix B.

At this point, one should decide on website design. The museum should be easy to use and navigate. Furthermore, one should decide on the aesthetic design of the site. For most cases, we recommend that the website be coded in HTML, however there are certain cases (such as a museum which will be constantly updated by various people) where using PERL based coding may pay off in the long run. This is discussed in the methodology of this report. We recommend that one uses an HTML editor with a front-end. This allows the website to be created quickly and easily. An acceptable program for this is Microsoft FrontPage. Additionally, there are many online tutorials explaining how to use HTML to create frames and tables (which are very useful methods of keeping the site organized). Example code for the creation of frames is detailed in the methodology section of this paper.

During design stage of the website, one may host the website off of their own hard drive. This can be done by creating a folder on one's computer which will contain all the files of the website in the exact hierarchal structure that they will have on the web server once the site is completed. This will not allow anyone to access the site, but will allow one to see that the corresponding HTML files link to each other properly. However, one should make sure that the hyperlinks coded

into each page do not correspond to the "local location" of the targets. That is, one should not have any code such as:

BAD CODE:

```
<a href="c:\museum\nationalities\african.html" target="main">African</a>
```

Instead, one should have the link be "in general"

GOOD CODE:

```
<a href="nationalities/african.html" target="main">African</a>
```

Notice that nowhere in this code is there a reference to the hard drive (i.e. c:\ ). If done correctly, one should be able to upload the contents of the folder containing the website directly to a web server and it should work flawlessly.

Once the text and audio/video interviews for each exhibit are completed and put in HTML form, it is time to add more multimedia to the site. It is a good idea to add to each exhibit pictures, sounds, and music corresponding to the ethnic group *globally*. That is, if one is making an exhibit for the French, have a picture of the French flag, an option to play the French national anthem, etc. Many of these resources can be found for free online. However, if the media you wish to use is not public domain, be sure to get the author of the material's consent before using it. If the person in question does not respond to your requests however, one may have their website link directly to the location of the multimedia of the site on which it was found originally. This is called "leeching". This practice is generally impolite however, and should only be used if the author refuses to respond to your requests. Another reason "leeching" should be avoided is if the

web page which hosts the file to which you linked removes the file, then your web page will contain a broken link.

Once one is satisfied with the website, it is time for them to put it on the Internet for the world to see. To do this, one needs to find a "place" on the Internet to put it. It may be a good idea to put the webpage on the same web server as the local historical museum, if such a website exists. However, there are also various web hosting domains which one may find through simple web browser searches. Many require an annual registration fee, but it is usually under $70 per year.

Once the website is accessible online, it is a good idea to make sure that it is maintained. It may be possible to delegate this over to the local historical museum, as they will be receiving updated history as time passes anyway. Furthermore, many individuals who are interested in the history and culture of their respective ethnic groups may work closely with this local historical museum. Thus, such persons will be able to maintain the section of their respective faction.

Suggestions for Future Projects:

There is still much to do that would make the museum better. History is constantly being written, and as such, there will always be work to do on a project such as this. It is likely that this project will be a persisting one; the content will continue to be hosted on the WPI servers, and anyone wishing to update its content will only need to e-mail WPI's Network Operations Office for a password.

One possible future project would be an update and upgrade of the site itself. Seven particular groups were focused upon for the project, but there are many more factions that deserve attention as well. A future project may involve the elaboration of the existing pages and the creation of new ones; doing further research, conducting interviews, and the organization and presentation of material on the site. Interviews for every remaining group alone would be a very impressive improvement to the site. This task may seem straightforward at first but it may present enough work for an entire project by itself. Such a project could ideally follow this basic outline:

1. Review existing information from this project. This includes not only a review of the virtual museum, but also this summation paper.
2. Determine exactly which groups to be interviewed (if not all) and find qualified representatives to interview, including backups. We suggest two or three backup interviewees.
3. Contact possible interviewees and schedule interviews. Although it may seem precarious to schedule interviews *before* writing the interview questions, the main reason to schedule first and write questions afterwards is:
    a) Many questions depend heavily on the context of who is being interviewed. Most subjects have had very interesting experiences relating to the subject matter, and it is worthwhile to inquire about these as well.
4. Write-up interview questions. This need not be done all at once; rather, it may be done any time before the interview itself.

5. Conduct interviews. This is the most straightforward part of the project, with guidelines set up already by WPI's Projects and Registrar's Office. For further details on the interview process, turn to the Methodology section of this paper.
6. Include interviews and interview information on the site. Any applicable information extracted from the meeting should be added to the page itself, and the recorded interview should be processed and added to the site. Turn to Appendix B for further details on audio data processing.

Another possibility for a future project would be the redesigning of the page itself. An early idea in the project was to allow multiple, dynamically created user accounts to log into the page and change its content easily and simply. These accounts would be given to the representative group of each ethnicity. However, the reality is that such an endeavor would be very difficult to accomplish, even with a notable expertise in webmastery and online programming. Such a venture would require an entire project's worth of work, especially if the site were to be completely redesigned aesthetically as well. For instance, a 3-D interface could be built, creating an even more realistic museum atmosphere. Users could log in, and click the direction they want to walk, or on displays they want to enlarge or play. However, this may present a steep learning curve for the user, and will consequently require that it be highly streamlined, and possibly have the standard question mark in the corner for help, if needed. Also,

one must consider bandwidth issues. A possible outline for such a project may is as follows:

1. Review existing information from this project. This includes not only a review of the virtual museum, but also this summation paper.
2. Determine what features to add to the museum. Will it have sound? Will it be 3-D? Will it be animated? Other than bandwidth constraints, the sky is the limit. This is the most important part of the project, as it determines what the new site will look, feel, sound, and surf like. This also involves an ergonomic and streamlining analysis of the layout and navigation system.
3. Ascertain what technology is required for a specific effect. For instance, a new design that relies heavily on animation may require Flash Animation, while a design that relies heavily on data manipulation may require PHP (PHP Hypertext Processor).
4. Research and/or acquire all technological skills needed. This may be the most difficult part of the project, depending on the ambition of the student. We would highly recommend Waldenbooks' selection of computer education books (specifically Web Design For Dummies); they are all fairly simple, well organized, and concise.
5. The actual improvement of the site is the last step. Although possibly not as difficult as part 4, this would be the most time consuming section. The exact process of this step, however, is completely up to the future group.

During the course of the project, the Worcester Historical Museum was a great help, not just for research purposes, but also for interviews and feedback on the site's progress. One possible future undertaking may be to work in conjunction with the museum to build a real exhibit based on the work done this year. The current group's work should provide a very strong research base, as well as an organizational structure for the exhibit. The potential methods of such a project would be:

1. Check with the Worcester Historical Museum for interest. The worst thing that could possibly happen would be to finish an exquisite project but somehow not have clearance from the museum to display it. In the time we spent there, they were very friendly, cooperative, and importantly for this, proactive. They will very likely encourage and aid such a project.
2. Conduct research on all groups. This would be almost exactly like the research steps in our project, except that they would also have the virtual museum as a resource.
3. Decide on featured groups. This should not only be based on available information and population, but also on available media.
4. Collect massive amounts of media on the groups at hand. Real museums rarely have a high bulk of text, and they will not be able to use 320x240 pixel images like those on the site. This may require additional interviews, but more so it will require visiting actual sites in the city, taking pictures, and studying its geography.

5. Present the project in an aesthetically pleasing manner at the Worcester Historical Museum. Details will depend solely on the resources and desires of the museum, and should be accounted for during step 1.

The last resource we would suggest for students doing a future project is the authors of this project. A Webmaster e-mail address is provided on the site for just such an event. This is so that anyone, including other students, can help with the effort to preserve the city's history.

Appendix A: The Exhibit Text

The African-Americans of Worcester

Unlike other ethnic groups, those of African decent were usually already citizens of the United States before they migrated to Worcester. In 1765, before the country's founding, there were already twenty-five blacks in Worcester and according to the first federal census in 1790, there were fifty-one. Many of these people had fought in Revolutionary War Units. Prior to the American Revolution, some of the "well to do" families in Worcester had owned slaves. However, the Worcester community adopted early on an abolitionist movement. In 1767, the town directed its representative to the General Court to "...use your influence to obtain a law to put an end to that unchristian and impolitic practice of making slaves in the Province." A local slave in the town of Barre (twenty miles west of Worcester) by the name of Quacko Walker, brought court action against a certain Nathaniel Jennison for trying to claim ownership of Walker as property inherited through a will. Originating in a Worcester court, and finally being resolved in the state's Supreme Judicial Court, Walker's court action was a success; in 1783, slavery was abolished in Massachusetts after the triumph of Walker. Additionally, it was added into the state's constitution that all Massachusetts residents were free men and women. Accordingly, "all of the area African-Americans completed their transition from slavery to freedom by the late 18th century" said local historian Thomas L Doughton (Worcester T+G 1998). This made Worcester an attractive place to which many African-Americans could migrate.

By 1820, the African-American population of Worcester reached 95, about half of which lived as workers or domestics of white residents. During the following decade, which was particularly appealing as a final destination for many runaway slaves since the construction of the Blackstone Canal offered them jobs. In 1831-1828 the "African School" was constructed, a school for black pupils only, but blacks were allowed to attend the common local high school as well. However, it was abolished in 1855 because the school committee disapproved of segregation of any kind.

Furthermore, the African-American community in Worcester became more centralized in 1846 when the first black church, the African Methodist Episcopal Church, was moved from its location of the basement of a Summer Street home to a building at 86 Exchange Street. This church survived displacement due to fire and later the construction of Interstate 290 and currently exists on 21 Belmont Street under the name African Methodist Episcopal Zion Church. Its presence prompted the development of an African-American community surrounding Belmont Street. By 1850 the population of African-Americans reached 184, many of whom lived in the Belmont Street community.

Peter Rich Sr., a son of slaves, moved to Worcester from Lancaster in the 1790s. From his income as a laborer, Rich bought much real estate in the Summer Street and Pine Street (now Shrewsbury Street) area. In the two decades between 1830 and 1850, a majority of Worcester's African-Americans lived in these areas (much of the Summer Street community and Belmont community coincided). This Summer Street area became known as the Laurel-Clayton neighborhood in

the 20th century. Also, Rich's family was involved in the establishment of the church on Belmont Street.

Worcester was also a part of the Underground Railroad. White abolitionists Abby Kelley and Stephen Foster, as well as African-American upholstery business owner William Brown, made their residences stops on this railroad. The African-American community was involved in many organizations during this time, such as Worcester's chapter of the Massachusetts Citizens Equal Rights Association and the Freedman's Aid Society, the later of which was created to assist former slaves. In 1860, the Anti-Slavery and Temperance Society of Colored Citizens gained the support of the AME Zion church, becoming the first African-American political party of Worcester. Despite all of this, from 1850-1860, blacks constituted merely a bit more than one percent of the city's population.

Worcester also served as the first for many black athletes. In 1878 Bud Fowler became the first African-American man to play professional baseball when he joined the Lynn Live Oaks, a team in the minor league International. Ten years later, George Washington Stovey joined the Worcester team in the New England professional league. However, being the best black pitcher of that time, his abilities gained him resentments from his fellow team mates, who purposely missed plays so he would lose and soon cost Stovey his position. Another eleven years later, in 1899, Worcester African-American resident Marshall W. "Major" Taylor won the world championship in bicycling in Montreal.

For the fifty years following the Civil War, many African-Americans migrated to Worcester from the south. Many African-Americans who came up from the Carolinas tried to raise money so that their families too could make the move, and established clubs to do so. By 1900 the city's African-American population reached 1,100 encompassing 265 households, and reached 1,241 by 1910. It was also during this time when the African-American Community made strides in town politics; In 1903, George Alfred Busby was the first African-American to be elected into the City Council, and served for two years. Following him was Charles E. Scott who was the second African-American to hold such a position, and served until his death in 1938.

Though, from its start, Worcester was a focal point for pro-equality and tolerance, the onset of the Great Depression turned the previously accepting views of Worcester sour; a wave of anti-black racism swept through the area. The blacks were not alone in this; the times also brought about anti-Catholic and anti-Semitic actions. This was particularly evident in the revival of activities by the Ku Klux Klan in Worcester, such as the burning of crosses. Despite this, or perhaps because of this, in 1926 a chapter of the NAACP (National Association for the Advancement of Colored People) was established in Worcester.

However, the Klan still had a noticeable effect as the African-American population, which was 1.378 large by 1930, then suddenly dipped. After World War II, though many cities experienced an increase in percentage of their black population, Worcester was an exception. In the 1960s this changed; the black

population nearly doubled, but only to two percent of Worcester's total population.

During the 1960s, Worcester instituted an urban renewal plan. The Exchange, Clayton, and Laurel Street sections (known as the Laurel-Clayton neighborhood) of Worcester were dismantled which caused dispersion of much of East Side's residents to different parts of Worcester. This decentralized the basis of the African-American East Side community essentially destroying it, according to Doughton. A testimony by a certain Ron Scott says, "Before urban renewal, black people in Worcester grew up together. We went to the Lincoln Square Boys' Club together. We attended the Belmont or Elizabeth Street schools together. We played ball together in a vacant lot where the police station is now. When urban renewal wiped all that out, we were fragmented." (Worcester T+G-1985)

In 1975, Elizabeth "Betty" Price was the first African-American elected to the city's school committee. She was the first to hold political office in the city since Charles E. Scott. According to Ms. Price, this dearth of political involvement is mostly due to the decentralization that occurred during the urban renewal plan. She says that the African-Americans in Worcester lack the strong, ethnic base of voting support on which many other African-American communities rely. However, in 1995, another black woman, Shirley A. Wright, was elected to the city school committee.

In addition to the descendants of former slaves, there has recently been a large influx of black people from West Africa. Just as many southern blacks sought the freedom of the north, the people of West Africa seek freedom here.

This is a freedom of a different type however: freedom from the wars, famine, and diseases plaguing Liberia, Nigeria, Ghana, and Somalia. There is a strong population link between Liberia and Worcester, and accordingly there are presently around 2,000 Liberians in the Worcester area. Jacob F. Barjolo, co-chairman of Liberians for Peace and Reconstruction, helps many of these new immigrants. Many of these immigrants want not just to escape the predicament of their homeland, but to take Worcester as a haven while they attempt to change them. They seem to share the belief that the US military should police the peace process in West Africa. The new African Immigrants are beginning to write a new chapter of African-American history in Worcester as the U.N. refugee program continues to bring many Liberians here to Worcester. According to the U.S. census, there are 6,000 recent African immigrants in Worcester county today. (Worcester T+G 2003)

The Irish of Worcester

Among the first to settle in Worcester were the so-called Scotch-Irish. These were Scottish Presbyterians living in Northern Ireland. On August 4th, 1718, five ships of Scotch-Irish from Londonderry, Ireland arrived in Boston. Though most of this party settled in Londonderry, New Hampshire, many settled in Worcester and surrounding towns such as Grafton. These Irish were mostly Protestant, so they blended in well with the rest of the developing town. These

Scotch-Irish attempted to have an independent church in Worcester but it was destroyed by a mob due to issues concerning taxation.

However, these immigrants were the minority of the Irish when compared to the wave in the year 1826. By 1826, construction on the Blackstone Canal had made its way to Worcester, starting from Providence. The contracting job was given to one Tobias "Tobey" Boland, who brought in scores of artisans and diggers, mostly of Irish descent, and they formed the backbone of the Irish community in Worcester. Many more came to the U.S. due to a famine in 1822. Unlike the early Scotch-Irish, these immigrants were predominantly Catholic, from Ireland's eastern counties. When the construction of the Blackstone Canal finished in 1829, the Irish took root in the city, and some took blue-collar jobs throughout the city. Many, however, continued work on Worcester's construction, and helped build train tracks to Fitchburg, Nashua, Providence, Norwich, and the Western Railroad, which led to Albany and Springfield. In the 1840s, the Irish potato famine drove thousands of people from Ireland to Worcester, finding jobs as unskilled laborers as their predecessors had. These workers settled in the Meadows first, in the vicinity of Mulberry Street and Shrewsbury Street, and spread south, throughout the city. As the population grew, more housing was built to accommodate them, and by the 1870s, thousands of Worcester's triple-deckers housed them.

In accordance with colonial and provincial custom, the town constable of Worcester issued warnings to those not authorized to live in Worcester. This was

done predominately to keep Worcester from being politically dominated by those outside of the Congregational faith. However, this was done largely out of tradition; it was never expected that the "strangers" take these warnings to heart. This old tradition, however, grew into a powerful xenophobic movement, called the "Know-Nothings". These Know-Nothings elected politicians to keep down the Irish and other immigrants in the 1850s, culminating with the gubernatorial election of 1854. In 1854, Worcester elected a Know-Nothing mayor, who set up a "nunnery committee" to investigate alleged treachery, treason, and other crimes at the College of Holy Cross. Obviously, there was no such evil taking place, and coupled with sympathy for the college after a fire in 1852, the Know-Nothing movement in Worcester eventually died down, a victim of its own overzealousness. Holy Cross won state incorporation soon thereafter, with little opposition. The victory of Holy Cross not only paved the way for the Catholic Irish of Worcester, but also helped set the stage for the foundation of Worcester Polytechnic Institute and Clark University years later. With an education, the later generations of Irish were able to gain middle and upper class jobs and social positions. In spite of this, the Irish still had to worry about "nativism" - xenophobic bigotry, in the city. The American Protective Association, an anti-Catholic, anti-Immigrant group, was formed in the 1890s, an echo of Know-Nothing politics. In 1893, the APA won control over the Worcester School Committee, and fired the superintendent for supposedly being too sympathetic towards the views of Catholic parents. Thankfully, this was the only major victory for the APA. In the 1920s, the Ku Klux Klan made its presence clear in

Massachusetts, and cross-burnings swept the state. Until even the 1970s, the Worcester Club rarely invited Irishmen, Catholics, or Jews into their midst. (Worcester Magazine, March 17th, 1993)

The Civil war came as a welcome relief to the Irish in Worcester, as it gave them a chance to prove their dedication and allegiance to the United States. The Irish Emmett Guards were the first militia in Worcester to volunteer for service. After they had proven that they were now Irish-Americans, they began being elected to public office. Irish people filled the ranks of the Fire Department, Police Department, public education from teachers to School Committee, and the City Council. In 1884, the first Irishman ran for mayor. Although he lost, it opened up the pubic to the idea of an Irish mayor. In 1900, Philip J. O'Connell won after a dead heat election. The final tally came out to be 8,061 to 8,061, and was settled by a special election in February 1901. Afterwards, both Democrats and Republicans would often play the "ethnic trump card" and nominate an Irishman for office. Occasionally, both parties would be able to mutually agree on a candidate, who would run under the "Citizen's Party" label.

The Irish continued their assimilation into American culture, and rose from blue collar to white. Irish lawyers would argue their cases to Irish judges. Irish college professors would critique the work of Irish artists. Irish bankers would grant loans to Irish entrepreneurs. In fact, the Bay Sate Savings Bank, founded 1895, was referred to as "the Irish bank" for the decades to come. Steadily, the Irish population grew. In 1860, the Irish consisted of 34% of the population. In

1870, it was 46%, and in 1880, the peak of Irish population, it was 48%. After 1880, the percentage of Irish in Worcester dropped, and with interethnic marriages and greater Americanization of the Irish-American culture, the Irish as we knew them began to fade, even though people of Irish descent still remain the city's largest ethnic group. In 1993, 35% of the city were Irish ("Inventing Irish America", Timothy Meagher), and this percentage has remained about the same since then.

As the years went by, more of the newer immigrant groups came to Worcester, and fragmented the areas that were once solely Irish. With the new inventions like the trolley, it was possible to work farther and farther from one's home. The Irish became better off economically and eventually made it to par with the rest of the native population. Thus, many Irish left Worcester, and were replaced by the next wave of immigrants. The Irish of Worcester had succeeded in becoming Americans, and although there may not be any more controversy over their presence, they remain a vital part of the city's history, and its culture.

The Jewish of Worcester

In the early 1880s, during the "New Emigration", there was an influx of Jewish immigrants to Worcester, predominately from Czarist Russia. The cause of this sudden surge was caused by a wave of violence against the Jews of Russia following the assassination of Alexander II. A large segment of these Russian Jews came from a part of Russia known as the "Pale of Jewish Settlement". Specifically to Worcester, most of these immigrants came from the part of the

Pale that was in Lithuania. New ideas such as Socialism and Zionism, which were becoming more prevalent in Russia, were major contributing factors for the Jews to leave Czarist Russia. Accordingly, from the years 1880-1920, over 3 million Russian Jews immigrated to America. Though the Russian Jews constituted the majority, there were also many Jewish immigrants from Spain, Portugal, and Germany. Those arriving in Boston or Ellis Island were screened for intelligence, physical and mental disability, and disease. Fifty-three percent of those arriving in Boston were under the age of twenty-one. Except for a few hundred, most of these immigrants arrived at Ellis Island.

By the turn of the century, Worcester had developed a reputation of being seed to many religious communities, thus making Worcester a desirable place for many Jews to settle. However, those arriving from the "Pale" were taken aback by the profound differences between the Worcester culture and the culture to which they were accustomed; the "Pale" was mostly agricultural area. The largest concentration of Jewish peoples, constituting over fifty percent of their population at this time, was in the area of Water Street. Beforehand, Water Street had been an Irish area. Although most of the Irish moved out of the area for newer parts of Worcester as the Jews moved in, the southern end of Water Street continued to remain mostly Irish. Other streets where there were many Jews were Harding, Harrison, Ledge, and Providence. Two hundred and fifty Jews declared Worcester as their specific destination between 1890 and 1930.

The Jews of Worcester had a strong preference for self-employment, mostly due to the constraints of their religion on their workdays imposed by the Sabbath. Because of this, many chose professions as peddlers, craftsman, or small shopkeepers, rather than seeking jobs in industry. The most successful of peddlers eventually opened up stores of their own. Many Jewish men became tailors and cobblers, while Jewish women usually became seamstresses, assistants to their husbands, or occasionally owned small businesses of their own. Some Jews chose professions specific to their religion, such as kosher butchers and bakers. Two of the most successful Worcester businesses to employ a large number of first generation Jewish immigrants were Abraham Israel's Underwear Manufactory, and David Pabolinsky's Underwear Manufactory.

In accordance with their culture, the Jews were great philanthropists; they made sure that the poor never went without special Passover foods or fuels and set up free loan societies and milk stations. In the early 1900s, the Water Street Clean Milk Station was created and many immigrants received free health care there. In 1919, many of these charitable organized banded together to form the United Jewish Charities. In 1947 the Worcester Jewish Federation was formed for similar goals.

In the early twentieth century, the Jews formed many worker unions. These included the Bakery and Confectionary Workers International- registered local # 133, the Ladies Waist and White Goods Workers Union- local # 43, and the Cloak

and Skirt Makers Union, local # 75.The Jewish also started several credit unions. Although, the only one largest to lend money for house mortgages was the Worcester Credit union, there were many smaller ones in existence as well, such as the Workman's Circle - a socialist national fraternal organization. This, and several other marketing advances on Water Street, made it a preferred commercial area.

The buildings of Water Street were constructed with tenements on the upper floors, and stores on the ground floors. Many Jews invested all of their money in order to create a store, and thus worked long and hard hours. It was not uncommon for some stores to be open past 3:00 AM on Saturday nights. Three of these businesses are still operated today by the same families that started them; Whitman's Creamery, Czarr's Barber Shop, and Weintraub's Delicatessen and Restaurant. Another establishment was Apelbaun's Pharmacy, which was the only place to pick up the popular Jewish magazine, the Jewish Daily Forward, which helped many Jewish immigrants adapt to Worcester. This business was started by Sophie and Nathan Apelbaun by selling newspapers from their home on Water Street. Thursday and Saturday nights were the busiest nights on Water Street, due to the Sabbath on Friday night. Many Jews could recall Rabbi Silver patrolling the streets to ensure compliance with Saturday's closing of shops. However, as soon as the sun went down on Saturday, the sidewalks were once again mobbed with people. Many Jews from neighboring towns would come on Sundays to buy kosher food, and to attend weekly meetings of the Workman's Circle.

Jewish people were used to operating in close-knit communities. Serving as a focal point for such a community in Worcester, the Sons of Israel Synagogue was constructed on Green Street in 1888. Many Jewish communities tended to relate themselves with others from the same geographic region. One group from Smolian actually sent a ship's ticket to rabbi Zorach Urowitz who then came in 1906 to serve this congregation. Other than synagogues, the most important establishment for a Jewish community is the cemetery. This stems mostly from the rabbinic rule that only Jews can be buried in Jewish cemeteries. The Worcester Jews did not get their own cemetery until 1896, and it was actually in the neighboring town Auburn.

The key difference between the Jewish immigrants in Worcester and those of other origins was that the Jews had come to stay. Many of the other groups had originally come for the purpose of making money and bringing it back to their home country. In testament to this dedication to become American, many Jews gave up their Yiddish names in favor of American ones upon arrival.

However, after this time period, Jewish immigration died off somewhat until Hitler started their persecution through the Nazi Holocaust. Then again, in the mid-1970s, there was an influx of Jewish immigrants, mostly from the Soviet Union. Much of the remaining Jewish population of Worcester is from the influx of immigrants as of 1976.

The Lithuanians of Worcester

The Lithuanians first arrived in Worcester in the late 1870s. The first went by the name of Streimikis, in 1879. Two years later, Stasys Kupstas moved to Worcester, and by 1890, there were over 400 Lithuanians in the city. In 1891, St. Casimir's Benefit Society was formed, which helped needy, sick, and otherwise unfortunate Lithuanians.

Worcester's Lithuanians had numbers, but they did not have a church. Lithuanians, who are predominantly Catholic, depended on visiting priests for confession and mass, or traveled to other cities. Eventually, they sent representatives to Springfield to speak to the bishop about their own church. The first four attempts failed, but afterwards, the bishop finally contacted the representatives. On the fifth visit, the bishop agreed that he would allow a parish if they were to attain 300 signatures on a petition. They succeeded, and began work on St. Casimir's Parish. The church, completed in 1894, was originally a small wooden one, and was shared with the city's Polish. The first pastor, Joseph Jackstys, spoke both Polish and Lithuanian, and was able to give sermons in both languages. After the founding of the church, on May 17, 1908, Jackstys left the church, and after World War I, he returned to Lithuania. As time went on, both the Lithuanian and Polish groups expanded, and in 1900, the Polish moved on to their own church, and the Lithuanians built another church on Waverly and Clakson, completed in 1916.

Like many European groups, most Lithuanian immigrants had an agricultural background. Because of this, they found the factory work of the industrial revolution in Worcester harsh and unusual. However, there was much work, and men could make seven to ten dollars a week, while women could make $2.50 to five dollars a week. To increase their income, they would often rent out rooms. Those who could not afford an

icebox ate the previous nights dinner for breakfast. Until their debts had been paid, couples would not even get married.

The Lithuanian community remained stable and steady throughout the early twentieth century. World War I helped solidify the community further, with over $30,000 raised for the aid of Lithuania by Father John Jakaitis, the 4th pastor of the church. In 1928, the first Lithuanian, Stanley Wackell, was elected to city council,. He later helped found the Lithuanian Credit Union to help his countrymen with the Great Depression.

After the depression, many Lithuanians arrived in America, fleeing Soviet oppression. As Father Richard Jackubauskas stated in a recent interview, in October, 2003, "They tried to stamp out all religion, because of their Atheist policy. They replaced the Lithuanian language with Russian, and converted the monetary system to rubles. They made people wait six to eight hours for food supplies, so they would have no food or opportunity to rebel. They would watch the teachers, made sure people could not go to church. Therefore, it was up to the parents and grandparents to teach their kids about Lithuania and religion, and this also created underground newspapers about the history of Lithuania and the communist plan. In Lithuania, there is a famous hill of crosses that the Soviets would keep bulldozing down, and the people would keep rebuilding. For people without guns and tanks, this was the only way they could fight back." These problems only became worse in the recent years. "In the 1930s, one million Lithuanians were shipped to Siberia for extermination, and Russian control continued with the communist empire."

When the Soviet army drove the Nazis out of Lithuania in 1944, Lithuania was once again subjected to communist rule. When America passed the displaced persons act, over

500 new Lithuanians came to Worcester. Furthermore, many of the postwar immigrants thought that they would be returning to Lithuania once the Russians left their country. "They thought it was a temporary thing – that the Russians would be pushed out and they would be free to go back."

Now, the Lithuanian people of Worcester have assimilated more into American culture. Newer generations were able to get a college education and get better opportunities than their parents, and many moved out of Worcester. Many also joined the Lithuanian Charitable Society, a social group that hosts dinners and fundraisers. "Only about ten percent of the population decided to marry other Lithuanians and teach their children the language", said Father Jackubauskas. "The rest have more or less assimilated into American culture".

Now, in the 21st century, the ancestors of the original Lithuanian immigrants to Worcester are scattered about the entire country. All but the occasional first generation immigrants speak English, and they no longer suffer from discrimination or other social disadvantages they once did. There are now over 10,000 people of Lithuanian descent in Worcester. Lithuanians are no longer a just a small group of foreigners in Worcester; they are a part of it.

The Poles of Worcester

The Polish first came to Worcester in the year 1885. These first settlers went by the names of Teofil Galaska and Michael Macko. They worked chopping wood in what is now the Cherry Valley. This work was very difficult, and the wages very poor. As with many other immigrants in Worcester, the first of the

Polish started off knowing little to no English and had to settle for low-paying, difficult jobs. For example, Michal Czechowicz, who worked at the wire mill located on Millbury Street, broke his arm, and his wife had a great deal of trouble getting him to the hospital since she spoke no English. To make matters worse, he was then fired. Like Michal, many other early Polish settlers found work in this wire mill, and some found work laying pipes for the electric company or stoking coal. During the 1890s and until about 1905, many factories here in Worcester provided free passage for Polish (and Jewish and Lithuanian) workers from their home country to Worcester in exchange for work. This was a win-win situation for those already wishing to come to America to work and for the companies themselves. However, not all was clear sailing; the Catholic Poles did experience some discrimination at times. According to Helen Czechowicz, a Worcester lawyer, daughter to the aforementioned Michal Czechowicz, some companies held the practice of not hiring Catholics or first-generation immigrants. She recalls being passed over for a job at the district attorney's office by a Swedish man who was not even a lawyer. Also, some of the early non-English-speaking Poles were teased. According to the Sunday Telegram:

"... A new comer would be instructed to go to the wire mill and say, in English, 'Boss, Give me a job. You are a fool.'..."

However, there was at least one account of the boss feeling bad for the man, and giving him he job anyhow.

The first Polish families to settle in Worcester were those of Kazimierz Sokolowski and John Nowakowski. With time, other Polish families followed them, and by 1894 there were about eighty Polish-Americans in the city of Worcester. However, most of these people were actually single men who came to America to work, and sent back the money to Poland and eventually, most of these men returned to Poland. Around 1904, more families began to arrive and settle permanently ending the Worcester companies' procuring of workers via free passage.

The immigrants from Poland came in two distinct races: the Jewish Polish and the Catholic Polish, or Slavic Polish. Also coming from Poland were the Lithuanians who were Arian in race but lived in Poland. These Lithuanians, though living Poland, kept their own culture and language just as the Scotch-Irish did in Ireland. (Nutts p. 344) Strong bonds existed between the Polish and Lithuanians of both groups on two major grounds; there were strong religious ties between the Catholics as well as the Jews of both nationalities, and both groups (speaking either as Catholics and Jews, or Polish and Lithuanians) were oppressed by the Russians during both the Czarist and Communist era. The Lithuanian and Polish Jews, who constituted the largest portion of Jewish immigrants to Worcester, were from neighboring regions of the "Pale of Jewish Settlement" and of course shared a common heritage in Judaism. The Slavic Poles in Worcester overtly shared a religious bond with the Lithuanian Catholics, as they shared the

church of St. Casmir with the Lithuanians. They continued to share this church until 1906, when the construction of St. Mary's Parish (now the church of Our Lady of Czestochowa) was completed. Furthermore, though of two different religions, the Jewish and Catholic Poles did share similar customs and a common language or Polish. It was not uncommon for those of the Jewish communities on Providence and Harrison Street to mingle with Polish Catholics and even Lithuanian Catholics.

Aside from strong ties with the Lithuanians, the Polish settlers of Worcester had strong enough internal ties to make them into a close-knit community. This closeness proved crucial for many adjusting newcomers; many were given free room and board from other already established Poles in the community until they got on their feet. According to Helen Czechowicz, "... [Polish] people who came after [her] parents would always find room in [her parents'] attic." (Worcester Sunday Telegram).

Around the time of the first Polish settlers in Worcester, the first Polish-speaking church in New England was constructed: St. Joseph's Church was opened on "Pentecost Monday," 1888, but with one problem (for the Catholic Poles of Worcester) - it was located in Webster. Though some of Worcester's Polish made the commute, most attended mass at St. John's, Notre Dame, and St. Anthony's. It was in 1894 that the Catholic Poles joined with their Lithuanian brothers at St. Casmir's. They actually put forth a joint effort with the Lithuanians

in this parish's establishment, but as both communities grew, and especially around 1904, when more Polish families began to settle permanently, it became apparent that each group would require a church of its own. Accordingly, in September of 1903, St. Mary's Parish was founded, and its construction was completed in 1906. This church has served as the meeting place for many Polish festivals and celebrations for nearly a century. Being of such importance to the Slavic Poles, it expanded over the years until its name was changed in 1950 to Our Lady of Czestochowa. Another importance advancement of the Catholic Poles was when the Sisters of the Holy Family of Nazareth oversaw the construction of St. Mary's Elementary School in 1915 and St. Mary's High School in 1936 (Polish Heritage).

The Polish community quickly became self-sustaining, having its own schools, churches, and businesses, such as tailor and barber shops and pharmacies. In fact, the community at one point was so isolated that most children did not learn English until they went to school; at home they would speak Polish. This extreme situation was most likely as strong as it was because in Poland, the Russian occupants forbade children to learn Polish; it was an attempt to rejuvenate their previously stifled culture. However, after the construction of St. Mary's Elementary School, the children were taught both Polish and English in school as well the Polish tradition of their ancestors (however, Polish is no longer taught there today).. Miss Czechowicz was quoted saying, "We could live all our lives without leaving the neighborhood. Up until 1920 or 1925, you didn't mix the

rest of the [Worcester] community." This point is further illustrated by the fact that during the early times, it was expected that dating and marriages be kept to within the Polish community. It was not uncommon for future husband and wife to meet at cultural events thrown by the community. In some cases, there was a bit of "matchmaking" played by the parents of young Polish people.

To alleviate the difficult times of the founding of the Polish Community, the Polish Community established many organizations to serve the community, specifically ones to help newcomers. A prime example is the Polish Naturalization and Independent Club, which met its first time in 1906. Its primary purpose was to help Polish immigrants become naturalized, and to make sure they hand a helping hand until they got settled.

As time passed, like most communities of immigrants, the Poles became more integrated and less isolated. By the 1960s, it was not uncommon for the Polish youth to play with the youth of other communities. Not surprisingly, intermarriage has also become common place. However, certain things have kept the Polish community strong, such as the 1978 election of the Polish-born Pope John Paul II (Karol Wojtyla) and the Polish resistance of Russia during the final years of the existence of the USSR.

The Warsaw Pact

From 1795 to 1919, the Russian-Prussian-Austrian Empire had subjugated and partitioned Poland. After World War I, Poland was independent for the first time in centuries until, in 1939, Germany invaded enforcing the Nazi-Soviet Pact- effectively splitting Poland between Nazi and Communist rule. In 1955, perceiving the establishment of NATO in 1949 as a threat, the Soviet Union, Poland, Bulgaria, Albania, East Germany, Romania, Hungary, and Czechoslovakia established the Warsaw Pact. This was originally supposed to be a mutual defense pact among the states involved- all of which were communist. However, Russia used this pact as a method of control. For example, during the Hungarian revolution of 1956, there was a movement for Hungary to leave the pact and become a neutral spectator of the Cold War. However, the Soviets demonstrated the first example of the Warsaw Pact as a method of military leverage against its own members; the Red Army crushed this rebellion with its army. This set the stage for the Brezhnev Doctrine, that is

"When forces that are hostile to socialism and try to turn the development of some socialist country towards capitalism, it becomes not only a problem of the country concerned, but a common problem and concern of all socialist countries."

This effectively meant that no country was ever allowed to leave the Warsaw

Pact, thus bringing every member under Communist rule. Thus the Russian control of Poland continued until the Pact was finally dissolved in 1991.

The Swedes of Worcester

The first Swedish settler in Worcester was Carol F. Hanson. Arriving in 1865, at an age of only 16, he made his start early, and by 1867, he had married and moved to Worcester. Three years after his arrival in Worcester, he began a music store which was later operated by his son, C. Arthur Hanson. Four years after the arrival of Hanson, a man by the name of Hans Trulson came to Worcester to work in a steel and wire plant. Ten years later after that, in 1882, he created the first Swedish grocery store of Worcester. It served as a meeting place for the local Swedish to discuss matters and to seek advice. He later sold it to be involved with a monthly Swedish magazine. This magazine was so successful that he converted into a weekly newspaper called Svea. It is now the largest newspaper in the country published in Swedish.

After Hanson, the next four Swedes to move to Worcester were four men from the town of Skåne, who went by the names of Sven Palson, Anders Person, Gustaf Ahlstrom, and John Wennerstrom. They arrived in 1868, and went to work at the Norton and Hancock Pottery on Water Street. Swen Paulson was aggressive, and

ended up becoming the leader of the newcomers. He left his girlfriend, Katrina Jeppson, back home in Sweden, but managed to get her to move to America in 1869. On April 2, 1872, they had a daughter, Jennie. This was the first child of Swedish parents to be born in the city. From that point forward, the number of Swedes in the city of Worcester increased every year. These people came to be known as the "Skånings". In 1876, there were over 200 Swedes in the colony.

The most famous of names among the Swedes of Worcester would have to be the name Jeppson. John Jeppson was born in Höganäs, Sweden, July 1st, 1844. As a boy he did much work in pottery, so shortly after the arrival of C. F. Hanson, he immigrated to Worcester and eventually began working under F. B. Norton- a pottery manufacturer. He left the company, and Worcester, in order to work his trade independently, but returned in 1880 again under Norton who by that time held many patents for emery wheels. Together with other employees, Norton bought the patents and started the Norton Emery Wheel Company and served as its superintendent. He also was responsible for the construction of the first plant in Greendale and helped start the Swedish newspaper Skandinavia which merged with Svea in 1918. From all his hard work, he earned the most prestigious and coveted of ancient orders: the Royal Order of Vasa bestowed upon him by king of Sweden himself. John Jeppson died in 1920 while vacationing in Cuba. The name Jeppson was not famous just because of John Jeppson. George N. Jeppson, his son, was born in Worcester on April 14th, 1875. After his public schooling, he attended Highland Military Academy and Worcester Polytechnic Institute. He then worked under the Norton Company for five years, but left to study at the

Royal School of Mines at Stockholm, Sweden. Upon his return in 1898, he quickly arose to assistant superintendent of the company, taking over as superintendent after the death of his father. In 1920, John Jeppson's mother donated $5,000 after the annual meeting of the Augustans Synod decided to create an Old People's Home in Worcester. She died a few years later, so in 1925, George N. Jeppson donated an additional building to add to the establishment, which was then already constructed at 26 Harvard Street. He was also a great lover of music, so accordingly he served as the president of the American Union of Swedish Singers for four years, starting in 1916 and in 1920 brought this union's music festival to Worcester. He also began early public service by his election in 1902 into the Common Council, from which he moved on to the Board of Alderman, where he served as president for two years.

What brought more Swedish immigrants to the city than anything else, however, was the Washburn and Moen Wire Works. Philip Moen had been to Sweden before to study their industry, and decided to offer jobs while he was there. Many came to work at the company, and it eventually became the American Steel and Wire Company, where thousands of people of Swedish ancestry eventually got jobs.

In 1915, Martin Swanson and Reverand John Eckstrom proposed the start of a Swedish bank. This gave rise to the Skandia Credit Union. It grew quickly, and by 1930, it had a bank charter. They changed the name to the Skandia Bank and

Trust Company. Later, the name was changed once again to the Guaranty Bank and Trust company.

In 1886, John E. Swanstrom organized Klubben Skandia, the first Swedish political club in Worcester. Originally, most Swedes were Republican in opinion. Charles R. Frodigh soon organized the Swedish Republican Club of Worcester, and helped recent immigrants become citizens and registered voters. James Forstedt was the first Swedish-born person to be elected to a public office in Worcester, as a member of the school committee in 1889. However, it was a man by the name of Holmes, not Jeppson, who gained the Swedes of Worcester the greatest political representation. In 1908, the Hon. Pehr G. Holmes was elected into the Common Council and after serving four years there, served another four in the Board of Alderman. He then was elected Mayor of Worcester three consecutive times. He was a three year member of the Governor's Council of Massachusetts starting in 1925, and in 1930 was elected as Congressman. Neither Holmes, nor Jeppson were however the first of the Swedes to be involved in politics. James Forstedt, who immigrated in 1880, served on the School Committee from 1889-1898. John F. Lundbeg was the first Swedish person on the Common Council in 1893 (and again in 1898), and Carl H. Bock was the first to be Alderman in 1904.

As part of their heritage, the Swedes brought with them the idea of organized churches. As a result, thirteen Swedish-speaking churches and one English speaking church- the Calvary Lutheran church- were constructed. Many of these

churches were Lutheran, such as the Gethsemane Lutheran Church attended by the Jeppsons, but many were Baptist ones too. The Swedes organized many fraternal lodges in Worcester and also started Fairlawn Hospital.

The Swedish population in Worcester continued to grow, and in the late 1880's, there were about 5000 Swedes in Worcester. By 1920, their were about 20,000 Swedish-born immigrants, and twice as many total Swedes in the city, constituting 1/5th of the total population.

The Hispanics of Worcester:

There were very few Hispanic citizens in Worcester prior to the 1960s. In fact, there were only a couple dozen Spanish-speaking people listed in the 1960 census. The 1960s and 1970s gave rise to a large influx of Hispanic people, mostly from Puerto Rico. These people sought out a better life, freedom, following dreams of a "land of opportunity". From 1970 to 1980, the city's Spanish-speaking population increased to 6,877 people from 1,674. Some Latino leaders in Worcester claim that that number is still short of the true total. During this decade Worcester's total population actually decreased by 8.4%. However, there were immigrants from Spanish-speaking countries all around the world, including Colombia, the Dominican Republic, El Salvador, and Guatemala. By 1985, there were about 10,000 Hispanic people in the city. Most took blue-collar jobs, like newly arrived immigrants of any ethnicity, especially in factories.

Only recently have Hispanics held public offices in the city. The first city councilor was elected in 2000, although Judge Luis Perez had already been working for the city for

quite some time. The language barrier, no longer a problem for most other immigrant groups in the city, is still a hinderance for Hispanics. In addition, there is only one Spanish newspaper in Worcester, El Vocero Hispano.

Like African-Americans, most of the Hispanic citizens of Worcester migrated from other parts of America. Although racially closer to most of the residents of Worcester than the African-Americans, they were still noticeably different. Another key difference between the Hispanics and most other ethnic groups is that the government played a larger role in their assimilation into the community. Many institutions were created, including the A.L.P.A., the Latin Association for Progress which served as the umbrella organization for community service. One of the main problems this group faced was the language barrier. Bilingual programs were started in local public schools to help aid Hispanic children to adapt . The Casa de la Comunidad was created to help with job placement, legal issues, and many other problems that newcomers were having. As time went on, A.L.P.A changed to Centro Las Americas, and the Hispanic community is now one of the most active subcultures in the city. According to the census in the year 2000, Hispanics account for thirteen percent of the population.

Appendix B:

Procedure for Showcasing Audio Interviews for Online Exhibits

The first step in implementing audio interviews on the website was actually recording these interviews. This was done by conventional analogue means. An analogue tape recorder was connected to a microphone. The microphone was positioned so that it could pick up speech from both of the interviewers and the interview candidate. We tested the set up to make sure that the tape recorder was indeed receiving an audio signal. After that, we simply set the tape player to record and conducted the interview.

After capturing the audio in analogue format, it needed to be converted to digital format for editing. To do this, a mini tape player was routed into the input of the sound card of a computer via a connecting double male mini-wire from its headphone jack. Then the computer was set to record the audio from the tape player. First, the audio level was check so that it did not cause "clipping". This occurs when the audio being recording is too loud. The audio file being created has a maximum loudness that can be recorded, after which, anything louder is scaled down this maximum value. Thus, the sound wave of audio louder will appear rectangular with respect to its amplitude and introduce distortion. After the appropriate volume levels have been adjusted, the audio from the tape player was then recorded as digital audio using Cakewalk Professional, a music/digital audio composition and editing program. However, one may alternatively use any wave

editing program. Cakewalk was used because it is easy to edit the recording afterwards with it.

Once in digital format, the interview had to be edited. There were two distinct types of edits that needed to be performed: editing for content, and editing for sound quality.

In some interviews, sometimes there were miscommunications, mumbles, noises, and other undesired audio. For instance, if the interviewee did not understand the question, and we repeated it, and then she answered it, then we would edit the audio so that it included our question and her answer, and not our discussion in between. Also, when someone misread a question or answer, rather than stopping the recording of the tape and rerecording it, we repeated the question or answer correctly. Thus, during the editing for content stage, we removed these mistakes. We did similar edits for unwanted noises.

In order to edit for content, we had to identify which segments needed to be removed. Then, these segments were "split" from the original and the digital audio was spliced together. It was often useful to have the audio fade out in volume before an edit, and fade back in after one, in order to reduce the occurrences of "clicks" in the audio track.

There were also several edits that had to be performed for sound quality. First of all, the microphone cord used was faulty in that sometimes the connection suffered in quality, causing everything to suddenly become quieter. To fix this, we selected these segments and boosted the volume of them to that of the surrounding audio. These glitches occurred quite often and were quite tedious to

remove. Aside from this, fluorescent lights, the tape player itself, and other electronic devices which emit audible frequencies, created a static "buzz" in the background of the recording. In order to remove this, we had to adjust the EQ (Equalizer) settings of the digital audio. To do this, we determined the main components of the buzz's frequency that did not overlap with the predominate tones of the vocal audio and lowered the volume level of these frequencies only. This lowered the volume of the buzzing. After this was done, we normalized the sound wave in order to have it play at a standard volume with respect to other digital audio being played on a computer.

Now the digital audio sounded exactly as we wanted it to sound on the site. However, as uncompressed digital audio, the audio file was a large portion of a gigabyte in size. This is much larger than even possible to be streamed over the internet. Now we had to compress the audio so that it would be only several megabytes in size, but also maintain clarity. To do this, we compressed the audio using a MPEG (Motion Pictures Expert Group) Layer-3 encoder at a 16 kHz sampling rate at a bit rate of 32 kbps. This stored the file as an MP3. The comparative size was about $1/100^{th}$ to the original, but left the audio quality at a satisfactory level.

Now that the exact audio file had been created, we needed to allow each visitor to play it on the site. To do this, we implemented a plug-in for Window's Media Player. This displays a toolbar with stop, play, rewind, and fast-forward options for the audio file. In order to make sure that each exhibit loaded quickly enough, we placed the code for this plug in at the *bottom* of the body of the page.

This is so that it is the last thing loaded. If it were placed at the top, the web browser would attempt to download the audio file before displaying the rest of the web page. This download could take several minutes if the viewer's internet connection is slow. An example of the code we used is:

```
<embed src     = "audio/jewish.mp3"
    autostart=false
    width   = 200
    height  = 60
    loop    = FALSE
    align   = left
    >
```

The information in quotations is the location of the audio file to be played. The line that says "autostart=false" means that the interview will not start playing automatically; one will have to click on the play button to make it start. The width and height lines specify the dimensions of the toolbar for the audio. The loop line specifies whether or not the interview will start playing from its beginning once it is finished. The last line just aligns the toolbar to the left of the page.

Appendix C: Letter of Introduction

(Date Here)

(Organization's Name and Address Here)

Dear Sir or Madam,

We are two students at Worcester Polytechnic Institute working on a project relating technology to society. Specifically, we plan to create a "virtual museum"- an interactive website presenting the cultural heritage of the various ethnic groups in Worcester. We would like to conduct an interview with a representative of your organization, in order to obtain more information about (ethnic groups) in Worcester. This project can be an additional forum for your organization and will contribute to the community. We will be contacting you by telephone in order to discuss the interview process. If you are interested, or have any questions about our project, you may contact either of us, by telephone or via email. Thank you for time.

Sincerely,

David Carchedi

and

Justin Fischer

David Carchedi and Justin Fischer

Email: djcarch@wpi.edu, fischer@wpi.edu
Telephone: ***-***-****

** Dean St.
Worcester, MA 01609

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