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From Dusty to Digital: Using Primary Sources

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SOS SOS --- / ... / --- First Wireless Operator Jack Phillips of the Marconi Company, the world's largest wireless company, for the first time in history taps out a new distress signal which had just been adopted at an international convention because it would be easier for amateurs to use and to pick up. Watching is Captain Edward J. Smith and Second Wireless Operator Harold Bride who had said: "Send SOS. It's the new call, and it may be your last time to send it." The time is 12:45 AM. The date is Sunday, April 15, 1912. The location is an ice field in the North Atlantic Ocean 800 miles east of New York where R.M.S.Titanic has just struck an 100 foot high iceberg and is foundering.

For the nearly 85 years since the sinking of Titanic, the actions of Captain Smith, Director Bruce Ismay of the White Star Line, lookout Frederick Fleet, and other crew members and passengers have been widely discussed and debated in newspapers, books, magazines, television documentaries, movies, Congressional hearings, a British inquiry, the Internet, and so on. The publication of A Night to Remember by Walter Lord in 1955 and the movie based on the book revived interest in the 1950's. The discovery of the final resting place of Titanic by Robert Ballard and a joint French/American expedition in September 1985 was an international sensation and added much more information to the documentary record. Director James Cameron's Titanic brought Titanic fever to yet another generation.

The story of Titanic is drama. The story of Titanic is mystery. But most of all the story of Titanic is history. Students typically see history as the study of "what happened way back then" and "just give me the facts, m'am". Robert Darnton, professor of history at Princeton University, states that "students arrive in class with the illusion that we've got history pretty much under control. It's in books they think: hard facts bound between hard cover"(1). That "what really happened" can be furiously debated, both at the time of the event and years later, is often unrecognized by students.

Today in the United States there is a tremendous interest in history. Not only professional historians and academics but also millions of Americans search archives both dusty and digital for family genealogical history; participate in Civil War reenactments; who collect memorabilia of all kinds; visit national, state and local historical sites and events; and regularly view the History Channel. Current events from the impeachment trial of President Clinton to the release of the Spike Lee movie Summer of Sam trigger an interest in history.

The purpose of the unit "From Dusty to Digital: Using Primary Sources in the Information Age - Researching Titanic" is to make students aware that real historical understanding requires them to engage in "historical thinking: to raise questions and to marshal evidence in support of their answers; to go beyond the facts presented in their textbooks and examine the historical record for themselves; to consult documents, journals, diaries, artifacts, historic sites, and other evidence from the past, and to do so imaginatively -- taking into account the historical context in which these records were created and comparing the multiple points of view of those on the scene at the time" (2). This evidence of the past is found primary sources.

This unit, "From Dusty to Digital: Using Primary Sources in the Information Age - Researching Titanic", will introduce students to primary sources: what they are, why they are important, how to identify them, how to access them, and how to evaluate them. Because learning should not take place in isolation, the context for this unit is the sinking of Titanic in April 1912 and the role that wireless telegraphy played in that event. Students will be introduced to the inventor of wireless telegraphy, Guglielmo Marconi, and learn about the wireless operators on board Titanic as they received ice warnings from other ships and later sent out distress signals.

It is important to note that, although the context of this introduction to primary sources is wireless telegraphy and Titanic, any another rich historical topic could also be used. The lessons in this unit have been designed so that they can be adapted to be used with any historical content.

The essay portion of this unit is organized according to the outline below:

I. Primary sources

- A. What are they?
- B. Why are they important?
- C. What should teachers think about when using primary sources with students?
- D. How can students identify primary sources?
- E. How can students access primary sources - both dusty and digital?
- F. How can students analyze primary sources (CARS)

II. Wireless telegraphy

- A. Electromagnetic or Radio Waves
- B. Guglielmo Marconi and the Invention of Wireless Telegraphy
- C. Maritime Use of Wireless Telegraphy
- D. Titanic and Wireless Telegraphy
- E. A Timeline of Wireless Interactions on Titanic
- F. Questions about Titanic's Wireless Communication

Primary Sources

Although textbooks, trade books, newspapers, web pages, television shows, and other media include primary source information - photographs, excerpts from diaries, statistics, historical maps, and documents of all kinds, a typical student does not have a good understanding of what a primary source is and how it is different from a secondary source. (The following can be used as a handout.)

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What are primary sources ?

Primary sources are created by eyewitnesses to or participants in an event who record the event or their reactions to it. These documents can be written, printed, painted or drawn, photographed, mapped, tape-recorded, filmed, video-taped or computer-generated. Primary sources are called primary because they originated with people who had primary, or first hand, knowledge of the event. Secondary sources are created second-hand, by people who were either not at the event or recorded information long after. Both primary and secondary sources may be reliable or unreliable (point of view, bias, poor eyesight/hearing, etc. (3).

Here are some basic kinds of primary sources:

1. letters, diaries, journals, wills, family bibles, report cards, etc.
2. business records such as correspondence, ledgers, minutes, speeches, invoices
3. poems, songs, hymns, chants, etc.
4. photographs, paintings, films, advertisements, and other artwork
5. tools, machines, urniture, clothing, and other artifacts from a particular era
6. government records such as court proceedings, treaties and trade agreements, census data, tax and voter lists, classified documents, laws, birth and death certificates, hearings, etc.
7. newspapers and magazines of the period
8. oral history interviews and genealogical information
9. memorabilia such as buttons, banners, flyers, etc.
10. other objects such as gravestones

Some primary sources are published documents that were created for large audiences. Others may be unpublished documents or personal items that were never intended to be public. Some documents were created at the spur-of-the moment; others as a routine transactions; still others with great thought and deliberation. The actions of some individuals or groups are richly documented; others not in the mainstream might have little or no representation in the historical record.

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Why is it important to use important to use primary sources?

"History begins with people caught in the moment-by-moment rush of events"(4). The reports that eyewitnesses make or the objects they create not only reflect a view of history but also offer a way to make history come alive. Using primary sources exposes students to multiple perspectives on the great issues of past and present. As students interact with primary sources, they develop knowledge, skills, and analytical abilities.

The current and growing interest in using primary sources is the result of two major realities in education. The first is that contemporary learning theory has moved away from the concept of student as a passive receptacle of knowledge to one where the student is expected to be an active learner in an inquiry-based environment. The teacher is not longer a "sage on the stage" but a "guide on the side." At the highest level, the student is expected to develop a question from which a problem can be solved or a decision made, conduct research, and develop and present results to an audience that goes far beyond the teacher and fellow students. Such an approach takes students beyond factual recall and into critical thinking skills of analysis, evaluation, and synthesis.

The second reality that educators must face is that, as a result of the information explosion, students now have quick and easy access to huge amounts of information. "Students now routinely encounter information in formats as simple as the picture book, as complex as the multimedia package, and as diverse as the literary classic and the personal homepage. The information explosion has provided countless opportunities for students and has dramatically altered the knowledge and abilities they will need to live productive lives in the twenty-first century"(5). As a result, students need to learn new skills of evaluating and interpreting information.

National standards reflect inquiry-based learning and information literacy. The National History Standards state that "real historical understanding requires students to engage in historical thinking: to raise questions and to marshal evidence to support their answers; to go beyond the facts represented in their textbook and examine the historical record themselves; to consult documents, journals, diaries, artifacts, historic sites and other evidence from the past, and to do so imaginatively -- taking into account the historical context in which these records were created and comparing the multiple points of view of those on the scene at the time" (6).

Information Power: Building Partnerships for Learning by the American Association of School Librarians states three information literacy standards for student learning.

> "Standard 1: The student who is information literate accesses information efficiently and effectively.
>
> Standard 2: The student who is information literate evaluates information critically and competently.
>
> Standard 3: The student who is information literate uses information accuratelyand creatively" (7).

National History Standard #4B discusses historical research capabilities and states that "students should be

able to obtain historical data from a variety of sources, including: library and museum collections, historic sites, historical photos, journals, diaries, eyewitness accounts, newspapers, and the like; documentary films; and so on."

What should teachers think about when using primary sources with students?

The American Memory section of the Library of Congress web site and its Learning Pages provide the following excellent guidelines for the educators who want to use primary sources:

1. Will this source be of interest to students?
2. What is the reading level? How difficult are the concepts? Would a glossary of terms be useful?
3. Is the length appropriate? Should I consider making excerpts? How do I ensure original meaning is still preserved in excerpt?
4. Are various points of view on the topic, event, issue fairly represented? Have I achieved proper bal ance?
5. Are the students using variety of sources - published, unpublished, text, visual, artifacts?

The Learning Page also offers thoughtful suggestions for using primary sources in four different phases of instruction:

1. How can I use primary sources in focus activities, those that introduce a topic or reengage students during a longer unit of instruction? Do any of the sources meet these criteria: present a puzzle, challenge a stereotype or conventional wisdom, present a contradiction, offer an insight (aha!), promotes empathy, or present a generalization or explanation against which others can be compared later?
2. How can I use primary sources in inquiry activities, those in which students explore main concepts in a block of instruction using an inquiry approach hands-on?
3. How can I use primary sources in application activities, those which help students apply concepts they are learning and also extend that learning beyond the textbook, other instructional materials, or other primary sources?
4. How can I use primary sources in assessment activities as tools for evaluating student mastery of skills and concepts? (8)

How can students identify primary source materials?

The journey towards finding primary sources usually begins with looking at secondary sources. Reading secondary sources - books, magazine articles, articles in encyclopedias and other reference books, web pages, etc. - gives the researcher background, particularly in terms on historical context - dates, places, people, events. Background reading can also help the research begin to develop research questions and also become aware of how difficult or easy it will be to locate information answering those questions.

At the back of a book or end of an article or web page, the researcher may find a bibliography which cites other sources, including primary ones, that the author used. Authors also make suggestions in "For Further Reading". Increasingly, authors use photographs, maps, excerpts from diaries, etc. that are from primary sources and these sources are cited.

Digitization makes identifying primary sources easier in several different ways. Academic and special libraries, most public libraries, and a growing number of school libraries have replaced their card catalogs with electronic catalogs. In a traditional card catalog, a researcher searches by author, title or subject (usually no more than two assigned per book) With an online or electronic catalog, a researcher can access a database of MARC records and can search by key word, date, Dewey decimal or Library of Congress number, illustrator, format, etc. Any word or number that is in the MARC record (MAchine Readable Cataloging) can be a point of access. Even an inexperienced user can achieve search results that are impressive and exciting.

Through Internet a researcher can use online catalogs from large public libraries, academic libraries, the Library of Congress, and other special libraries to identify primary sources. We are not very far away from a time when a generation of library users will never had had the experience of flipping though cards in a wooden card catalog. Note: use of electronic catalogs merely makes identifying and determining the location of sources easier; the research still must get to the "real stuff".

The Internet can also open up other pathways to primary sources. Online book- stores such as Amazon.com list books and other materials available for purchase (note: these materials are "in print"; "out-of-print" materials, often the most important kinds of sources for historical research, will not be included.) Searching online bookstores may reveal books that are reprints of original editions as well as materials printed to meet the interests of a new audience. For example, transcripts of the 1912 Senate hearing investigating the sinking of Titanic are now available in paperback with an introduction by James Cameron, director of Titanic , who describes how this material was a very helpful source for writing the movie screenplay). Also on Internet the researcher will find web sites ranging from those created by governmental departments to those sharing a personal interest or hobby. It is not unusual for authors of web pages to include a "link" to the primary source itself. Researchers may also find sites that sell artifacts or reproductions. Lucky researchers may even find eyewitnesses accessible through e-mail.

How can students access primary sources - both dusty and digital?

Having identified possible primary sources, students must then access them. Information technology adds a new dimension to this step in the research process.

I. "Dusty" or Traditional

Access to primary sources can be as straight forward as talking with a neighbor, looking at family photos, finding an autobiography in the school library or looking at some of the local history materials at the nearby public library. Libraries have traditionally included in their collections such materials as Documents of American History, historical atlases, collections of letters, books with photographs, etc. Libraries usually also have bound volumes of popular older magazines such as National Geographic and Saturday Evening Post and have microform versions of other newspaper and periodical articles accessible through indexes like Readers Guide to Periodical Literature and New York Times Index . Many libraries maintain clippings collections on topics of local interest and also house documents of local history.

A trip to the local video store may also reveal primary source materials. For example, Casablanca is part of the history of the 1940's. Produced in 1943, the film is a look at refugees in Morocco, and is even more revealing of American perspectives on the role of the U.S. in the world during World War II. Documentaries (not docu-dramas) may also be found at the video store or library.

Another traditional or "dusty" way of accessing primary source materials is to visit an archive, museum, genealogical society, historic site, historical society, battleground, monument, etc. With any luck the site is in a somewhat convenient location and open at a somewhat convenient time. Once at an archive, our historian will probably need to use a card catalog, printed index, or other specialized guides to the collection. Often there are special limitations put on the use of items because of rarity or fragility. Appointments and fees for use may be required. Some archives place limits on the age or scholarly connections of potential users. It is not unusual for photocopying to be forbidden.

Any discussion of access to materials must include interlibrary loan. Libraries will often loan materials, but students should be aware that receiving materials could take weeks. Increasingly, libraries are able to fax materials.

As we have seen, access to some primary sources can be straight-forward. Access to others can be extremely labor-intensive and time-consuming. Access to still others is absolutely impossible due to travel, time, and financial constraints. Researching, either "dusty" or digital, involves a lot of hard work.

II. Digital Access

Digital or electronic access to materials, through both indexing and through representations of the documents and artifacts themselves, is growing exponentially. On Internet are virtual libraries, virtual natural history museums, virtual exhibits, online bookstores (www.amazon.com) and sites which will sell everything from original postcards to reproductions of Civil War rifles. There are also genealogical records (www.familysearch.org, a site put up by the Mormon Church), patent and census records, magazines that exist only in digital format, documents of all kinds, Supreme Court hearings, photographs, videos, audio, etc. At a public or academic library the researcher can use a computer to access digital reference books like The Grove Dictionary of Art Online (the print version is 34 volumes) or 109 years worth of National Geographic on CD-ROM. Every state has at least one depository for patent and trademark information.

The "dusty" method of access to periodicals and newspapers involved using paper indexes such as Readers' Guide to Periodical Literature and New York Times Index as well as a host of other specialized indexes. Although at this time using such indexes is still the only way to access many older periodicals and magazines, researchers increasingly use electronic databases available in CD-ROM or on Internet. Some of the indexes provide citations about the material (title, name of magazine, date, pages, and availability) but increasingly online databases provide access to the full text and even a graphical representation of the item itself. But a digitized version of an item is not the same as the original item. An analogy would be a hand written letter from a friend ("Where does she get that crazy stationery? Her hand writing is worse than ever!") as compared to an email. The content might be the same but content is not everything.

One of the exciting concepts within digitization of libraries is the creation of virtual libraries. Through these a researcher can access both primary and secondary sources. The largest effort to make primary sources materials available online is the American Memory Project from the Library of Congress. For almost 200 years, the main purpose of the Library of Congress, the largest library in the world, was to be a research library for Congress; it also was a repository for America's treasures. It was also viewed by many as "the library of last resort", the place to visit when all other possibilities in the local community or university were exhausted.

A new age of access to the Library of Congress began with the American Memory pilot program. In 1990, American Memory was launched as a five year pilot program to test the concept of utilizing digital technology to make some of the Library's rare and unique Americana collections available to the community at large. Of the Library's nearly 110 million items, 70 million are in special, or non-book collections. From these, the pilot program digitized and put on CD-ROM almost 300,000 items, including:

- photographs from the Matthew Brady Civil War collection,

- early films of Thomas Edison,

- postcards and pictures from turn-of-the-century America,

- life histories from the WPA Federal Writers' Project,

- early sound recordings of America's leaders, and

- documents of the Continental Congress Constitutional Convention.

By 1994 it had become obvious that the Internet was an alternate to CD-ROM for distributing digitized documents and images from the American Memory collection. In July 1994, the Library of Congress established its World Wide Web site (www. loc.gov) and in line with its commitment to make resources accessible to students and educators, established "The Learning Page" (lcweb2.1oc.gov/ammem/ndlpedu) which debuted in March 1996 and received more than 100,000 hits in its first six months online. The Learning Page has grown substantially since its beginning and now includes a project where teams of teachers and library media specialists apply to become "American Memory Fellows" and develop units teaching the use of primary sources to k-12 students. In these units, teachers are using primary sources to supplement or enhance textbook-based curricula and to stimulate critical thinking; library media specialists use the same materials to teach research methods.

The American Memory site drew 132,000 visitors in February 1999. These visitors had access to 1.7 million items with a goal of 5 million by next year, the library's bicentennial. The target is to make available 80 million

items that can not be easily obtained elsewhere. Educators should be aware that items like early movies and sound recordings, maps, manuscripts, Presidential papers, photographs, and baseball card collections are available. Also accessible electronically are 2,800 lantern slides representing the work of landscape architects including Frederick Law Olmstead with views of cities, buildings, parks, maps, models, etc. in a collection entitled "American Landscape and Architectural Design, 1850-1920." Fragile and rare books are also being put online. Besides its own collections, the Library of Congress plans to put other institutions' materials on the American Memory site. Some upcoming digital collections will be Civil War materials form the New York Historical Society and the archives of the Chicago Daily News from the Chicago Historical Society. Now the Library of Congress can be the "library of first resort" on the Internet. It is a place where teachers and students find the "virtual reading rooms" open, accessible, and inviting to enter.

Digitized versions of artifacts can also be accessed online. One example is the National Park Service (www.nps.gov) which provides links to national historic sites such as the Edison National Historic Site in West Orange, New Jersey (www.nps.gov/edis/home.htm). A visitor to this site can find out about artifacts including manufactured goods such as photographs and radios as well as lab furnishings, machines, tools. In the archives are 5 million pages from lab notebooks and drawings as well as family papers. There are 26,000 photos of which some are available on line. Although the number of primary sources that a researcher can use through the website is limited mainly to photographs, this site and similar ones help the historian/student in search of primary sources by identifying their location, accessibility, etc. After all, not everything is available through digitization; there will always be a need to be in physical contact with a source. This web site also offers ways that the researcher can obtain objects through loans of materials or copies of photos.

Historians recognize that newspapers offer a window on the times in which they were published. Newspapers reporters have been known to say that they "write the first draft of history." Every fact may not be in the story. Every consequence may not have been questioned. Yet the "eyewitness's story evokes unforgettable urgency and energy, and a sense of truth"(9). Not only news articles, but photographs, want ads, advertisements, editorial columns, and many other features capture a sense of cultural history. Yet newspapers are very fragile. There is a growing interest in preserving these important documents. The U.S. Newspaper Program (www.neh.fed.us/ html/usnp.html) is a national effort to locate, describe, preserve, and provide public access to this type of human record which can be found in public libraries, county courthouses, newspaper offices, historical museums, college and university libraries and archives. Newspapers are preserved on microfilm, micro-opaque, eye-readable reproduction or facsimile. As technology moves forward, an increasing number of newspapers will also be available digitally.

A word of caution about digitization: "No digitized version can match the original - its handwriting or typography, its layout, its paper and all the paratextual clues to its meaning", says Professor Darnton. Think about the front page of a newspaper and the additional information you can gain from just be seeing it in its entirety. The importance of the article is indicated by the type-size of its headline, its position on the page, and accompanying photographs or sidebars. The article in isolation on a screen eliminates some of the context that shapes the meaning.

How can students analyze primary sources?

National History Standard #4C discusses historical research capabilities and states that "students should be able to interrogate historical data by uncovering the social, political, and economic context in which it was created; testing the data source for its credibility, authority, authenticity, internal consistency and completeness; and detecting and evaluating bias, distortion, and propaganda by omission, suppression, or invention of facts".

Students need to approach any source - contemporary or historical; primary or secondary; print, nonprint or electronic as well as human - with a set of criteria to analyze the information presented. Robert Harris presents such an approach, although developed for looking at Internet sources, that is also applicable to analysis in general. It is called the CARS Checklist (Credibility, Accuracy, Reasonableness, and Support (10). He created this system to remind people that source evaluation - the determination of information quality - is an art based on inferences from a collection of clues.

Credibility - capability of being believed or trusted: What about this source makes it believable? How does the source know the information? Why should I believe this source over another? Elements to look for here are the author's credentials (education, training, and/or experience). If the author is an organization, what kind is it - corporate, governmental, non-profit? Is there evidence of quality control? Peer review, approval by members of the organization, review by an editor, etc. Most traditional media (books, magazines, organizational documents) usually have to meet some kind of approval of content before being made public.

Accuracy - correctness: Is this source factual, detailed, exact, comprehensive? Is it up-to-date or is currency relevant? Are important facts and other information deliberately left out? Did the creator invent information? Who is the audience for the source and what is the purpose - to inform or to persuade? Students should be alert to an air of carelessness and look carefully for dates, vague generalizations, and a very one-sided view that does not acknowledge opposing views or respond to them.

Reasonableness - fairness, objectivity, moderateness, and consistency: Is the information balanced (even the opponent's claims should be presented accurately), reasoned, fair? Is there a conflict of interest? Is the information really likely, plausible or possible? This is difficult for any researcher with a limited content background but every effort should be made to use previous and accumulated knowledge in a way that helps evaluate new information. Does the information make sense? Are there inconsistencies or contradictions?

Support - corroboration: Where did the information come from? Are sources listed? Is there a bibliography or other documentation? How does the author know what she/he knows? Do other sources agree? Don't take anything at face value. Cross-check each piece of information and compare with others.

It is very important for students to remember that every source is biased in one way or another. A source tells us only what its creator thought happened or wants us to think happened. Students should also consider how the source was created - routine or spur-of-the moment? Was it intended to be published?

Another area of consideration is when the document was created. Is it part of the event? Is it an account created at the time by firsthand observers or participants? Was it created after the event (still by firsthand observers or participants)? Was it created by someone not a participant but using interviews or evidence from the time of the event?

Students should be skeptical about every source found, just as historians are. Additional questions to ask: What may we never know? How can we find out about those people whose voices do not appear anywhere? Who preserved this piece of information and why? Do sources contain conflicting information and if so, how can it be evaluated?

Why Titanic?

For this unit about using primary sources, any one of many contents could have been chosen. Teachers should feel to use a content area that can make the lessons relevant to their students and their curriculum. I selected the sinking of Titanic because I felt that many students already had background information about this topic as well as an interest in it. There are many questions about this tragedy that can engage students: Was the design of the ship faulty? Why was there so much disparity in survival rates between first and third class passengers? Why did Californian , anchored nearby, fail to recognize distress signals? Why were some of the lifeboats, already inadequate for the number of passengers and crew, sent away less than full?

Because this unit is part of this seminar "Electronics in the Twentieth Century", I have chosen to focus on the role of wireless telegraphy and Titanic.

Background Information on Wireless Telegraphy

For centuries people tried to find ways to communicate messages over distances without having to carry them in person. What follows is a summary of the invention of wireless telegraphy. It is provided here for teachers to make available as a handout to those students who have an interest and want to understand the historical background of the role of the wireless telegraph.

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A Brief History of Wireless Telegraphy

Electromagnetic or Radio Waves
Radios, cell phones, pagers, garage door openers, space probes, model airplane navigation, animal tracking, walkie-talkies,and other communication devices all rely on the use of electromagnetic or radio waves. We are indebted to Michael Faraday, an English scientist, who combined his own understanding of light and heat waves, electricity, and magnetism in order to propose a theory that there was an additional form of invisible waves and called these "lines of force". James Clerk Maxwell's development of a series of mathematical equations in 1864 proved the existence of electromagnetic waves and that the waves were precise and moved at the speed of light, 186,000 miles per second. Next came a German scientist Heinrich Hertz who performed a series of experiments in 1887 that generated electromagnetic waves, confirming Faraday's theories of a half century earlier as well as proving the accuracy of Maxwell's equations. Hertz's oscillator was the first radio transmitter. Maxwell's theory and Hertz's experiment gave Guglielmo Marconi the idea of using electro-magnetic waves to transmit messages around the world.

Guglielmo Marconi and the Invention of Wireless Telegraphy
Guglielmo Marconi, an Italian physicist born in 1874, was the inventor of wireless telegraphy. As a young boy

he had a fascination with electricity and was even taught Morse code by a family friend. As Marconi's daughter Degna relates in her book, My Father, Marconi , Marconi,while spending the summer of 1894 in the Alps, picked up an Italian electrical journal and found an article about Heinrich Hertz (who had just died earlier that year) and his work on electromagnetic waves. The article was written by Augusto Righi whose lectures Marconi had audited the previous winter. Marconi was excited about the possibilities of using transmitters to send signals in the same way that electric wires transmitted electromagnetic waves. Degna Marconi: "If this was a turning point in my father's life, it was also, in a real sense, a turning point in the evolution of the world we know and take for granted" (11).

Marconi began experimenting on his father's estate using an induction coil with a spark discharger controlled by a Morse key at the sending end and a coherer at the receiving end. "Because Marconi was untrained as a scientist he achieved his results more through experimentation and reasoning" (12) and after countless experiments he succeeded in transmitting wireless signals to a receiver more than eighteen hundred yards away, farther than any other scientist.

Receiving little encouragement in Italy, in 1896 Marconi went to London where he got a job with the British Post Office. Further experiments led to his being able to transmit wireless signals nine miles. He got his first patent in 1896 and gave a series of successful demonstrations in which he used balloons and kites to obtain greater height for his aerials. He was able to send signals over greater and greater distances. In 1897, with the help of wealthy relatives, he set up the Wireless Telegraph and Signal Company. These activities attracted a great deal of international attention; he was invited back to Italy. In 1897 Marconi went to La Spezia where a land station was erected and communication was established with Italian warships at distances up to 19 km. A lot of skepticism still remained about the use of this discovery. But Marconi's cousin Jameson Davis helped finance his patent and set up the wireless Telegraph and Signal Company (later Marconi's Wireless Telegraph Company Ltd.).

In 1899 a wireless station in England communicated with a station in France (distance 50 km) and battleships exchanged messages at 121 km. In September 1899 Marconi equipped U.S. ships to report to newspapers in New York City the progress of the yacht race for America's Cup. The success of this demonstration aroused considerable excitement and led to the formation of the American Marconi Company. The following year Marconi International Marine Communications Company, Ltd. was established for the purpose of installing and operating services between ship and land stations.

Many mathematicians believed that the curvature of the earth would limit practical communication by electrical waves to a distance not exceeding 161-322 km, but Marconi in December 1901 received messages sent across the Atlantic Ocean from Cornwall, England to Newfoundland. This achievement caused extreme excitement and became the starting point for the development of radio communications. In 1909 Guglielmo Marconi and Karl Ferdinand Braun won the Nobel Prize in physics for wireless telegraphy.

Maritime Use of Wireless Telegraphy

In the summer of 1898 the Dublin Daily Express requested that the Marconi Company undertake supplying a minute-by-minute account of the Kingstown regatta. Marconi chartered the tugboat Flying Huntress and reported on the details of a yacht race. He sent more than 700 messages to shore. Newspapers printed stories about the race before the yachts had returned to shore.

The first British ship to use Marconi wireless was the royal yacht, Osbourne. On board was the Prince of Wales who had suffered a knee injury and preferred to recuperate on the yacht rather than at Osbourne House with his mother, Queen Victoria. The queen invited Marconi to set up wireless communication between Lakewood

Cottage on the grounds of Osbourne house and the royal yacht. During the next sixteen days, a hundred and fifty messages went between the yacht and the house (13).

Marconi wireless was gathering lots of attention. Ship owners, impressed by his ability to send messages over water, began purchasing wireless systems and installing them on their vessels. One use was for the ships to signal receiving stations as they approached the coast. Like lighthouses and foghorns, wireless stations could provide warnings and locations. But only wireless was helpful in all weather conditions.

Wireless also contributed to rescue operations. On March 3, 1899, a message was received from the East Goodwing Lightship which had been rammed in heavy fog by the steamer M.F.Matthews. A wireless message went out asking for a life boat.

By 1900 Marconi's company was the largest wireless company in the world. Ships outfitted with Marconi systems regularly communicated with other ships and stations on land. However, there was as yet no worldwide wireless communication network. And Marconi knew that a link between Europe and America was crucial. But how could messages be sent such a long distance? He built stations in Newfoundland, the closet point in North America to Europe, and in Polhu on the western coast of England. He experimented with various sizes of antennas, and increased the power of transmitters. On December 1, 1901, the first message spanned the Atlantic. However, reliable wireless transmission across the Atlantic took over five more years to perfect.

By 1912, hundred of ships had Marconi machines; only a very few had the equipment of competitors. Marconi also built a ring of stations on the North American coast with a very important one at Cape Race on the eastern tip of New Foundland which provided information about snow and ice to shipping in the North Atlantic.

To promote wireless in the United States Marconi journeyed to America to report the America's Cup races for the New York Herald. When the race was postponed because of poor weather, a rumor started that one of the ships had gone down. The Herald wired Marconi at sea who wired back that the boat was safe (14).

By 1912 wireless was still regarded as a novelty and there were no procedures for handling the many messages received, some of which were addressed to the captain, others to the ship, and others that were to be relayed elsewhere. Operators were not trained navigators so they were not able to necessarily see the significance of some messages. By 1912 all passenger ships were equipped with wireless equipment, the vast majority of which was supplied and manned by Marconi Company employees. This represented a real safety improvement particularly for vessels in the ice-ridden North Atlantic lanes where previous warnings came from vessels which had arrived in port and therefore whose information was very dated.

However, use of wireless was still very erratic. The range was short, operators were inexperienced and not trained in navigation, much time was spent relaying messages between ships at sea and those in contact with a land station, and much of the traffic was frivolous personal messages (15). Not all wireless shacks were manned and operated around the clock. In short the use of wireless in the maritime industry was in its infancy and was not yet regarded as an important navigational aid. This attitude was to have a major impact in the Titanic tragedy.

Titanic was regarded as "state of the art" in terms of engineering. The Marconi wireless equipment on board was powered by a 5 kilowatt motor generator in the engine room and backed up with an emergency generator elsewhere in case the engine room flooded. An additional source of power was storage batteries in the Marconi room itself. It had a guaranteed working range of 250 miles but communications could be maintained for up to 400 miles during daylight and up to 2000 miles at night (16). The "Marconi room" was located on the boat deck, the same as the bridge, at the afterend of a superstructure containing the bridge and the officers' accommodations. The wireless cabin contained a sleeping room, a dynamo room, and an operating room. Although Titanic had 50 telephone lines, no line connected the wireless room with the bridge. On Titanic the two wireless crew, First Wireless Operator John (Jack) G. Phillips, 25, and Second Wireless Officer Harold Bride, 21, were considered part of the Victualing staff along with the waiters.

A Timeline of Wireless Interactions on Titanic

Thursday April 12. The French liner La Touraine sends a message warning of ice but it is 1,000 miles away. This message is given to Captain Smith who then gives the position to Fourth Officer Boxhall who notes it on the map in the chart room.

Friday April 13. Titanic and Rappahannock pass each other and Titanic is warned of heavy ice pack. Also on April 13 there were some problems with equipment but they were fixed by 5 AM. This resulted in wireless operators Bride and Phillips being very busy trying to catch up with passenger messages to be sent.

Saturday morning at April 14 at 9 AM. Caronia reports "bergs, growlers, and field ice". This message is put into a frame above the chart room table and later shown by Captain Smith to Second Officer Lightholler. After lunch at 1:42 the Baltic transmits a message reporting ice 250 miles ahead of Titanic. This message is shown to Bruce Ismay, managing director of the White Star Line, by Captain Smith. Ismay later shows this news with two socially prominent ladies. This message was never noted on the bridge. At 1:45 Amerika reports passing two large icebergs at 41.27N,50.8W. This message was addressed to the U.S. Hydrographic Office in Washington, D.C. but it was beyond her own range; as was the custom, Titanic forwarded it. This message is not sent to Captain Smith.

Saturday evening at 7:30. Californian reports ice 50 miles ahead at 42.3'N,49.9W. This message was addressed to the liner Antillian and Bride just happened to catch it. At 9:40 Mesaba reports a huge ice field, latitude 42N to 41.25”N, longitude 40W to 50.30”W: "much heavy pack ice and great number large icebergs, also field ice". This message indicated there was a wide belt of ice some 78 miles directly across the ship's path. Titanic was already in the rectangle blocked out by this warning. It is a mystery what happened to this message.

11:00 PM. The freighter Californian states "We are stopped and surrounded by ice", but doesn't give position; later it is discovered that this ship is only ten miles away from where Titanic sank.

By this time Titanic is within range of the land-based Marconi station in Cape Race, Newfoundland and Operator Phillips is trying to transmit many personal messages about arrival times and hotel reservations. He is also relaying messages to ships no longer in direct contact with land. He responds to the California message by saying: "Shut up. Shut up. I am busy I am working Cape Race."

11:30 PM. California Wireless Operator Cyril F. Evans closes down his set by going off duty at his regular time.

He is being visited by Third Officer Groves who likes to visit when off duty. Evans says that Titanic is nearby. Groves puts on head phones. He has some basic skills that enable him to to read simple messages but doesn't know much about equipment. He does not wind up the magnetic detector so can't hear anything; he puts headset down at 12:15.

11:40 PM. Titanic strikes a massive iceberg.

12:15 AM The first Morse code message from the doomed passenger ship is sent out when First Wireless Operator Phillips transmitted “CDG - MGY” along with the ship's coordinates. Cunard lines Carpathia operator, Harold Thomas Cottam, who was on the bridge when the distress signal was first sent, is now back at his wireless station and sends a casual message that there were private messages waiting for Titanic at Cape Race. Phillips responds: "Come at once. We have struck a berg. It's a CQD, old man. Position 41.46N 50.14W."

Sixty-eight miles away Carpathia hears the call for help and responds. Other ships within range hear the distress call and turn to help while also relaying the message to others. The land-based Marconi wireless station at Cape Race on the far eastern end of Newfoundland passes the message onto the newly installed wireless station on the roof of Wannamaker's Department Store in New York City where David Sarnoff, a young operator, catches the faint signal. The word is spreading to the whole world.

12:34 AM. Frankfurt is 50 miles away. Phillips asks if they are coming to assist and gets the question "What's the matter?" Phillips responds: "Tell your captain to come to our help. We are on the ice". Olympic, Titanic's sister ship is 500 miles away but with a powerful wireless set. She keeps in touch and urges closer ship to assist.

12:45 AM. First Wireless Operator Jack Phillips taps out a new distress signal that had just been adopted at an international convention because it would be easier for amateurs to use and to pick up. Watching is Captain Edward J. Smith and Second Officer Bride who had said: "Send SOS. It's the new call, and it may be your last time to send it." Rockets are also set off. Wireless messages continue to be sent out.

1:25 AM. Olympic asks "Are you steering south to meet us?" Phillips replies: "We are putting women off on boats." A message comes in from Frankfurt:: "Are there any ships around you already?" From time to time Captain Smith stops by to warn that power is fading.

1:45 AM. Phillips sends another message to Carpathia: "Come as quickly as possible, old man; engine room filling up to the boilers." As Phillips continues to send messages, Bride drapes overcoat on Phillips's shoulders and straps on his own life belt.

2:10 AM. The last wireless message from Titanic is sent as Phillips struggles to keep the set going. The last message sounds two v's which were heard faintly by Virginian as he tries to adjust spark for better results. Bride makes final inspection tour. A stoker comes in and tries to take Phillips' life jacket. A fight breaks out and the Bride grabs his arms and Phillips hits him again and again until the stoker becomes unconscious.

At the sound of sea gurgling up the A Deck companionway and washing over the bridge the men run out. Phillips disappears aft. Bride joins others on the roof of the officers' quarters where there are collapsible boats. Bride grabs an oarlock from a collapsible lying upside down and is washed overboard, under collapsible B as the falling funnel washed boats clear of the crowd. Swimmers make their way to these boats. The collapsible is still upside down with Bride floating on his back and breathing stuffy air. With a dozen men on top of the boat, Bride dives out from under and climbs on.

2:17 AM. All power is lost.

2:20 AM Sunday April 15, 1912. Titanic goes down.

3:30 AM. The rockets of Carpathia are first seen by lifeboats and at 4:10 the first lifeboats arrive at Carpathia. One of the survivors is Second Wireless Officer Bride.

8:50 April 15, 1912. Carpathia heads to New York with survivors.

Over the next three days no news was wired from Carpathia to shore except for private personal messages Thursday April 18: Titanic arrives in New York City with 745 survivors including 206 crewman and four officers.

Wireless Operator Bride is interviewed by reporter Jim Speer who went onto Carpathia a with Guglielmo Marconi. His survival story is published by New York Times under headline: Thrilling Story by Titanic's Surviving Wireless Man" . Friday's papers had a flood of misinformation from passengers as less scrupulous reporters write stories which they knew would not be checked

April 19-May 25: Senate hearings begin with the testimony of crew and passengers.

May 2-July 3: British Board of Trade Inquiry is held.

Questions about Titanic's Wireless Communication

In the days after the tragic sinking of Titanic, Guglielmo Marconi, inventor of the wireless telegraph, was hailed as a hero. His invention had saved the lives of over 700 passengers because ships at sea had been able to receive the wireless messages and come to the aid of Titanic. But there had at least six wireless messages received by Titanic warning of growlers, bergs, pack ice, and field ice in a band 78 miles wide through which the Titanic would travel. Some people believe that if these warnings had been heeded, the Titanic would have completed her maiden voyage safely. There are several explanations about which messages reached the captain and why. One is that the telegram from Mesaba which gave precise details of the massive ice field in the path of Titanic did not contain the MSG prefix, indicating a personal message for the captain which he would be required by regulations then in force to personally acknowledge. The radio operator of the Californian also failed to use the MSG prefix in the message from his captain to Titanic.

Other issues came up about wireless telegraphy and how it operated aboard ship. The first ship reaching the site of the Titanic disaster was Carpathia which had immediately changed course after hearing Titanic's distress message. At 14 knots it took Carpathia four hours to arrive, having steamed 68 miles. It rescued only those in boats; those entering the water did not survive. Within sight of Titanic and ten miles away was California, a steamer who had earlier reported being surrounded by ice and whose records of the night show that it had seen Morse code lights and distress rockets from Titanic but had not responded.

Regardless of how California's actions have been explained, one fact is indisputable. At 11:30 PM, minutes before Titanic hit the iceberg and 45 minutes before the first of many distress signals were transmitted, California Wireless Operator Cyril F. Evans closed down his set by going off duty at his regular time. Evans was being visited by Third Officer Groves who had an interest in wireless and had some skill in receiving and transmitting. Groves puts on the head phones, but not knowing much about the equipment he doesn't wind up

the magnetic detector and therefore so couldn't hear anything. Groves puts headset down at 12:15. The California is only ten miles away from Titanic but the wireless room is closed for the night.

During the days when Titanic was proceeding towards New York, the world was desperate for news. Much misinformation was distributed like this headline:

"Passengers Safely Moved and Steamer Titanic Taken in Tow - Carpathia and Parisian Care For Those Aboard Disabled Liner While Virginia Lends Aid to Make Port - Bulkheads Hold - Office of White Star Company Confident Steamer Is Unsinkable and Will Float Until Halifax Is Reached. BULLETIN: New Haven Railroad Schedules Special Pullman Train to Halifax to Accept Passengers."

One reason was that there was no wireless traffic other than personal messages sent from Carpathia. There have been a variety of explanations for this silence. Some speculated that information was withheld so that insurance companies could adjust their loss rates; others believed that Marconi directed his employees to be silent. One explanation was that the Carpathia's own wireless operator was incompetent so that Bride of Titanic was left to do the work. Bride later stated: "the public should not blame anybody because more wireless messages about the disaster to the Titanic did not reach shore form Carpathia. I positively refused to send (answer) press dispatches because the bulk of personal messages with touching words of grief were so large... I just worked wireless. The splutter never died down. I knew it soothed the hurt and felt like a tie to the world of friends back home. How could I take news queries? Sometimes I let a newspaper ask a question and get a long string of stuff asking for full particulars about everything. Whenever I started to take such a message I thought of the poor people waiting for their messages to go - hoping for answers to them. I shut off the inquirers, and sent my personal messages"(17).

Any of these issues surrounding wireless - warnings of ice not heeded, distress messages not heard, misinformation about the tragedy, the roles of other wireless operators and of Marconi himself, could be of interest to a student historian. Although more than 700 of those on Titanic survived, many passengers and crew members died the morning of Sunday April 15, 1912. Still today, the actions of those on Titanic are being discussed. In this mystery, in this drama, students researchers can find the real "stuff" of history.

Notes

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Lesson 1

Topic of lesson:

What are primary sources? What are secondary sources? Why are they important?

Objectives:

Students will demonstrate an understanding of the difference between primary and secondary sources. Students will recognize that primary materials are created by eyewitnesses or participants in an event and that secondary sources are derived from primary sources.

Materials:

Handout 1: "What are primary sources?" (see text of unit); Worksheet 1: "Who Was There?"; primary and secondary sources in a variety of formats (books, magazine articles, newspaper articles, printouts of web pages, maps, charts, government documents, memorabilia (reproductions of), oral histories, etc. related to Titanic and wireless (see "Materials for Classroom Use"); additional primary and secondary sources connected with any other topic and time period (especially those of different types than about Titanic like an article of clothing from the fifties or sixties, for example); chart paper with these column headings: "What We Know...Or Think We Know" and "How We Know" to record class work; chart paper with column headings: "They Were There" and "What They Created"; scrap paper for each student; set of flash cards for each student: PRIMARY on one and SECONDARY on the other;

Lesson development:

Day 1: Engage the students by asking them what they know or think they know about the sinking of Titanic on April 15, 1912. Record these on chart paper under the heading "We Know..." (include "?" next to those items students are unsure of). Ask them how they "know" what they "know" and record these as well under the heading of "How We Know". Review definitions of primary (generated by eyewitnesses and participants) and secondary sources (developed from primary sources). Review the list of "How We Know"and put a "P" beside those that students consider are primary and "S" beside those that are secondary. Explain why primary sources are important to historical research. On another sheet of chart paper, generate a list of people who could be considered eyewitnesses or participants "They Were There". Be sure to include in the discussion what actually should be considered "the event": just the sinking itself (a few hours) or other things that happened before the sinking (perhaps even in the construction of the ship) and as well as after. Include names eyewitnesses/participants when possible. Next, assign students to small groups and distribute worksheet 1, assigning the time period that each will focus on. Distribute a variety of general resources as well as those supporting the time period they will be asked to consider. After competing the assignment, each group then shares its list of eyewitnesses/ participants and the teacher records, noting overlaps and adding names. Students are asked to bring in any Titanic materials they might own or have found online.

Day 2: Review and revise the list of eyewitness/participants. Review handout 1: "What are primary sources?" which includes a listing of different kinds of primary sources. After distributing scrap paper, ask each student list at least three eyewitnesses/ participants from the chart along with some kind of primary source that could be connected with the person. (Example: first class passenger - letter describing ship board life). The teacher will record these as well as other suggestions on the chart. This is the time for the teacher to discuss where there might be under-representation of individuals or groups in the historical record (i.e., first class versus third class passengers). The teacher then distributes a set of Primary and Secondary flash cards to each student. Using a variety of primary and secondary materials both related to Titanic and not, the teacher briefly describes the item and asks student to hold up the Primary or Secondary flash cards. Discuss the answers.

Assessment:

Teacher notes participation in the flash card activity.

*****Worksheet #1: Who Was There?*****

Group members _____

Assignment:

With your group, brainstorm who could have been an eyewitness or participant in your assigned time period. Use your background knowledge as well as the resources at your table. Record your answers below.

Time Periods

___1. Outfitting of Titanic (winter 1911/1912) and departure Tues. April 9, 1912 until

Sun. evening April 14 at 11:40

Preparation of the ship, departure from Southhampton, England (Tues. April 9), and westward sailing

___2. Sat. April 14 11:40 PM through Sun. April 15 8:30 AM

Iceberg struck, Titanic sinks (2:20 AM), and last survivors rescued by Carpathia

___3. Mon. April 15 through July 3, 1912

The world waits for the Carpathia's arrival in New York City (Thursday evening April 18) through conclusion of American and British hearings

___4. After the summer of 1912 until now

More information is revealed as survivors continue to tell their stories and more information is revealed; the discovery of Titanic by Robert Ballard in 1985 and the movie Titanic lead to additional information

Lesson 2

Topic of lesson:

How can you find primary sources?

Objectives:

Students will understand that primary sources are often located by examining secondary sources such as books, periodical articles, web pages, etc. as well as reference materials including indexes and databases. Students will search some of these sources and create lists of primary sources related to Titanic.

Materials:

Handout: "What are Primary Sources" from lesson 1; access to online catalogs, online bookstore such as amazon.com, magazine databases such as Electric Library; photocopies of Titanic entries from Readers' Guide to Periodical Literature 1914 and New York Times Index 1914, enough secondary sources about Titanic so that each group has several (borrowed, if necessary, from other libraries); Worksheet 2: "Searching for Primary Sources".

Lesson development:

Using the list of eyewitness/participants and the types of possible primary sources p (lesson 1), the teacher leads discussion about how such sources might be further identified and accessed, i.e., "how can we find oral histories/interviews with survivors?" State that identifying primary sources is usually done through examining secondary sources whose authors often include references in their "Works Cited" or "For More Information". Also, a close reading of secondary materials can provide clues. Example: "While the Carpathia was still at sea with the survivors, the U.S. Senate passed a resolution that the Committee on Commerce would investigate the causes leading to the wreck". This alerts the researcher that there is a Senate resolution as well as transcripts of the Senate hearing (government documents that are primary sources) available. In addition, primary sources can be identified through using online catalogs and indexes (paper and digital) as well databases such as amazon.com for in print books.

Teacher reviews kinds of secondary sources and reference tools that may contain information about primary sources. Teacher models completing worksheet using a source. Pairs of students are given several copies of worksheets and work independently identifying sources.

*****Worksheet #2: Searching for Primary Sources*****

Names _____

Directions: Complete a separate form for each primary source you identify.

Title and/or Description of Primary Source _____

_____

Type of Primary Source (letter, government document, etc.)_____

How/Where Found (reference in book, Library of Congress catalog, etc. _____

_____

When Created _____ Who Created _____

Comments: _____

Assessment:

Students share their results and teacher evaluates their work.

Notes to Teacher:

Students should have the research skills and knowledge to use the following basic reference tools:

*online catalogs Many schools now have such automated catalogs. Students should also be comfortable using the catalogs of their own public library and nearby colleges and universities. Advanced students may also use the Library of Congress catalog

* periodical indexes and databases Many schools subscribe to these on CD-ROM or via Internet. Students should also know how to use the paper version of Readers' Guide to Periodical Literature for pre-1990's articles.

*online book stores such as amazon.com Searching by keyword "Titanic" in these large databases will reveal over 200 books and other items currently in-print. For topics of historical interest, students may find reprints of older materials as well as new interpretations.

If your students are not competent with these tools, plan lessons with your library media specialist. Lesson 3

Topic of lesson:

Analysis of web sites related to wireless telegraphy using CARS Checklist

Objectives:

Each pair of students will use the CARS Checklist to evaluate a website, comparing information from background knowledge provided by handout on Wireless Telegraphy and Titanic (see section of paper)

Materials:

Handout: "Wireless Telegraphy" (see text); handout of performance task "Wireless on Titanic: The W.O.W. Project"; CARS Checklist; Internet access or print-outs of web sites (locating these sites can be done in a lesson on using different search engines or the teacher can provide these materials); material to engage the students with wireless (clips of video of Titanic or Night to Remember, facsimile of Marconigram, etc.; web sites (see "Materials for Classroom Use")

Lesson development:

To engage the students show a video clip that has a connection with wireless on Titanic (operators at work, messages brought to Captain Smith, etc.) or some facsimiles of Marconigrams. Review handout "Wireless History and Timeline" reminding students that what they have read is a secondary source, i.e., developed from other sources. Assign students to small groups, distribute the performance task "Wireless on Titanic: The W.O.W. Project" and review the assignment. Model evaluating a web page using the CARS Checklist. Students then follow the procedures and work online or with printouts of the site to be evaluated.

Assessment:

Teacher checks student work. Students share their results.

Wireless on Titanic: The W.O.W. Project

BACKGROUND: Setting sail on her maiden voyage from Southhampton, England on Tuesday April 10, 1912, the R.M.S. Titanic , 11 stories high and four city blocks long, was hailed not only as the most luxurious ocean liner the world had ever known but also as "unsinkable". On board were state-of-the art telegraphic equipment and two Marconi operators. The role that wireless telegraphy played in the tragedy, both on Titanic and on other ships in communication with her, has long been debated.

TASK: You and your team are have been hired by the Titanic Historical Association to help create an online research guide called W.O.W. (Wireless on the Web) which will be published on their website. The purpose of this project is to provide guidance to researchers looking for information about wireless and Titanic. The users of W.O.W. will find your CARS analysis of each source very helpful. Some of these sources have already been located and ready for your evaluation. You may need to find others.

AUDIENCE: Researchers, historians, and others who have an interest in the R.M.S.Titanic and wireless telegraphy.

PURPOSE: The purpose of this project is to inform the user about the quality and usefulness of different sources of information.

PROCEDURE:

1.Understand the task assessment list because it will be a guide to your work.

2. Learn about CARS through your teacher's use of it.

3. Read "Wireless and Titanic" to get background information.

4. With your team, analyze your website using the CARS List.

5. Using the CARS Checklist, complete the W.O.W. Evaluation Form.

W.O.W. Evaluation Form.

Title of Web Site: _____

Web address: _____

Date viewed: _____ Date website created: _____

Creator: _____

***=Excellent **= Good *=Poor and/or Not available

____Credibility - Can I trust this source?

____Accuracy - Is this source correct?

____Reasonableness - Do I get a feeling a basic fairness?

____Support - Does the information hold up?

____+ - Language and Conventions

Comments: _____

CARS Checklist (adapted)

Name _____

Name of web site _____

Web address _____

Credibility - Can I trust this source?

1.Who is the creator of this source? _____

2.What is his/her background? education? training and/or experience? _____

_____

3. If the author is an organization, what kind is it - corporate, governmental, non-profit? _____

4.How does the source know the information? _____

Accuracy - Is this source correct?

1. Is the information factual, detailed, exact, comprehensive? Explain _____

_____

2. What is the date of creation ? _____

3. Is it up-to-date or is currency relevant? _____

4. Are important facts and other information deliberately left out? _____

5. Who is the audience for the source? _____

6. What is the purpose - to inform or to persuade? _____

7. Is information presented carefully and thoughtfully? _____

8. Is there a very one-sided view that does not acknowledge opposing views or respond to them? _____

Reasonableness - Do I get a feeling a basic fairness?

1. Is this source fair? _____

2. Objective? _____

3. Moderate? _____

4. Is there a conflict of interest? _____

5. Is the information really likely, plausible or possible? _____

6. Does the information make sense? _____

7. Are there inconsistencies or contradictions? _____

Support - does the information hold up?

1. Where did the information come from? _____

2. Are sources listed? _____

3. Is there a bibliography or other documentation? _____

4. How does the author know what she/he knows? _____

5. Do other sources agree? Don't take anything at face value - cross-check each piece of information and compare with others. _____

+.and also think about...

1. Is grammar, punctuation, and usage correct? _____

2. Are there misspellings? (Misspellings may indicate sloppy scholarship or that English may not be native language)

Materials for Classroom Use/Reading List for Students

Primary Sources for Students - Lesson 1

Periodical articles at the time of the event:

Periodical articles of the times offer a variety of points of view, accuracy, etc. Access these through the paper index to Readers' Guide to Periodical Literature vol.1910-1914 (pages 2568-2569).

Examples: " *High Speed Though the Ice Fields* " Scientific American. 107: 2. July 6 1912; also " *Wireless and the Titanic* ". World's Work 24:225-6. June 1912.

Newspaper articles at the time of the event:

The sinking of Titanic made headlines around the world. Access articles in The New York Times Index through its paper index. Example: " *Several trans-Atlantic captains tell of encountering same icebergs that sank Titanic* " (April 16).

Wireless Operator Bride's account of the event in the New York Times can also be found in can also be found in Eyewitness to America: *500 Years of America In the Words of Those Who Saw it Happen* , pages 325-330.

A very select group of newspaper headlines about the event can be found at the Virginia Newspaper Projects's online exhibit " *R.M.S.Titanic - 83 Years Later* ", http://vsla.edu/vn. There are many good links: "Inaccurate or Misleading Reporting" -"Headline Coverage" - "Editorial Cartoons" -"Aftermath and Inquiry", etc.

From the British perspective, see *David Bryceson's The Titanic Disaster* : As Reported in the British National Press April - July 1912.

Photographs:

Titanic: An Illustrated History . Text by Don Lynch. (New York: Hyperion,	1992). This lavishly illustrated book contains dozens of paintings created by Ken Marcshall as well as hundreds of archival photographs.

E.E.O'Donnell's The Last Days of the Titanic : Photographs and Mementos of the Tragic Maiden Voyage This book includes a cache of photos taken by Francis ("Father') Brown who got off the Titanic in Ireland after Southhampton found in a Dublin basement.

Government Documents:

"The Titanic Inquiry Project Website", http//www.3.mwis.net/ ~breaktym/ TIP.htm. Contains transcripts from the U.S.Senate inquiry; transcripts to the British Inquiry are in progress. Excellent primary sources such as testimony affidavits, memos, geologic info, charts, etc. Included here are interviews with the Titanic's surviving wireless operator as well as other wireless operators.

Kuntz, Tom. The Titanic Disaster Hearings: The Official Transcripts of the 1912 Senate Investigation. New York: Pocket, 1998.

Wireless messages/Marconigrams:

"The R.M.S.Titanic Radio Page", http://usersnetinfo.com.au/anars. This site presents the numerous Marconi Radio messages that were sent and received.

Poems:

The great outpouring of emotion at the time of this event resulted in many poems. NYTimes Index is one source. Especially of interest is the black perspective.

Letters:

Alistair Forsyth's Titanic Voices: Memories from the Fateful Voyage . Find here unedited letters from the servants as well as previously unpublished photos and oral histories.Many of the third Southhamtpon

Oral Histories:

The Titanic and the Sinking of the Titanic: A Survivors' Story by Archibald Gracie and John B.Thayer . Read the words of these survivors.

Geofrey Giuliano's That Fateful Night: True Stories of the Titanic Survivors in Their Own Words Included here are interviews with British survivors.

Jay Henry Mowbray's The Sinking of the Titanic: Eyewitness Account. This is a republication of 1912 book and contains 32 photos.

Artifacts:

The Titanic Collection: Mementos of the Maiden Voyage by Eric Sauders. This box contains reproductions of actual tickets, deck plans, menus as well as replicas of telegraph warnings and other documents.

Songs:

"History in Song", http://www.fortunecity.com/tinpan/parton/2/ has song lyrics through a link from "Tragedies and Disasters"

Other primary sources:

" *Titanic: Tragedy at Sea* ". Two videos " *Echoes of Titanic* " and " *Titanic Remembered* " Distributed by Madacy Entertainment, 1997. Both videos rely extensively on primary sources of many kinds (newspapers, interviews with survivors, other documents, photographs, film) to tell the story.

Some Secondary Sources for Students - Lessons 1 and 2

A search on www.Amazon.com shows over two hundred books related to Titanic from juvenile fiction to scholarly imports. Here are some of particular interest.

Ballard, Robert. The Discovery of the Titanic . Toronto: Madison, 1987.

The oceanographer details the exciting underwater discovery.

Brewster, Hugh. 882 1/2 Amazing Answers to Your Questions about Titanic.

Toronto: Madison, 1998. You can find the answers to 882 1/2 questions (because

Titanic was 882 1/2 feet long).

Davie, Michael. Titanic: The Life and Death of a Legend . New York: Knopf, 1986.

A solid overview is presented here.

Dudman, John, The Sinking of the Titanic . New York: Bookwright, 1988.

This juvenile title in the Great Disaster series is very readable.

Lord, Walter. A Night to Remember . New York: Henry Holt, 1955. This readable

account includes Lord's interviews with survivors.

Lord, Walter. The Night Lives On . New York: William Morrow, 1986. Lord

continues his research.

Wels, Susan. Titanic: Legacy of the World's Greatest Ocean Liner . New York: Time- Life,1997. Great illustrations can be found here.

Web Sites - Lesson 3

More sites can be found using a search engine such as AltaVista and the search terms: Titanic and wireless.

"Article from Shipbuilder Midsummer 1911,http://www.geocities.com/Pentagon/2519/titanic/marconi.htm>, July 17, 1999. Article from 1911 describing wireless equipment on Titanic; includes diagrams.

Johnson, Dwight. "The Radio Legacy of RMS Titanic." http://www.avsia.com/ djohnson/ titanic.htm> May 14, 1999.

The RMS Titanic Radio Page, http://usersnetinfo.com.au/anars> April 18,

1999. Nineteen pages specializing in the radio aspects of the Titanic disaster.

"Titanic Inquiry Project Website", http: www3.mwis.net/~breaktym/TIP.htm>, July 17

1999. Contains transcripts from the U.S .Senate inquiry; transcripts to the British Inquiry are in progress. Excellent primary sources such as testimony affidavits, memos, geologic info, charts, etc. Included here are interviews with the Titanic's surviving wireless operator as well as other wireless operators.

"Titanic Disaster as Viewed from Cape Race", http://titanic.gov.ns.ca/wireless.html> July 19, 1999. The nearest land-based station to Titanic recorded the wireless traffic; facsimile of records

"Titanic Wireless Operators", http://starway.org/Titanic/WirelessOperators.html> July 17, 1999. Brief information on operators Bride and Phillips.

"Wireless and Titanic", http://www3.sympatico.ca/hrc/haida/radio/titanic.htm>, July 17,1999. This site discusses the distress calls.

Bibliography for Teachers

American Association of School Librarians. *Information Power: Building Partnerships for Learning* . Chicago: American Association, 1998.

Information literacy - the ability to access and use information - is the core of learning . This professional publication provides a conceptual framework for library media specialists and others working to connect students and information.

Darnton, Robert. "No Computer Can Hold the Past." New York Times. June 12, 1999. A:15.

A Princeton history professor voices concern that students doing all their work on Internet may develop a misunderstanding of research itself and even of the subjects studied.

Dawson, Anthony B. "Titanic Tells Twin Tales of Insensitivity." New Haven Register. July 1, 1999.

Black New Haven Alderman Anthony Dawson responds to his daughter's comment after viewing the movie Titanic "Dad, I didn't see any black people on the Titanic. He researches the black response to the sinking.

"*Learning Page*", *American Memory* http://lcweb2.loc.gov/ammem/ndlpedu> April 18, 1999.

The Library of Congress recognizes that educators need help in connecting students with primary sources and provides excellent guidelines here (lessons, too).

Lord, Walter. A Night to Remember . New York: Henry Holt, 1955.

This is a basic source for background reading.

Lord, Walter. The Night Lives On . New York: William Morrow, 1986. Lord adds to his original research in this volume published thirty years later.

Molutsky, Irvin. "Accessible via Modem, the Library of Congress." The New York Times, April 8, 1999. G: 5.

The author describes the national effort to build a library without walls.

"*National History Day*" , http://www.thehistorynet.com/NationalHistoryDay>, April 17, 1999.

This site describes the annual national research competition which focuses on students using primary sources.

The RMS Titanic Radio Page, http://usersnetinfo.com.au/anars>, April 18, 1999. Nineteen pages specializing in the radio aspects of the Titanic disaster.

U.S. Newspaper Program", http://www.neh.fed.us/html//usnp.html>, April 19, 1999.

This is the home site for a project dedicated to locating, describing, preserving, and providing public access to the human record originally captured in newspaper.

see also "Materials for Classroom Use" for more information on Titanic