

***THE LAND DIVIDED, THE WORLD UNITED: BUILDING THE PANAMA CANAL  
FINAL REPORT***

Actions undertaken

The Linda Hall Library mounted a nine-month gallery exhibition opening on April 8, 2014, entitled, *The Land Divided, The World United: Building the Panama Canal*. With generous funding provided by the United Engineering Foundation, the Library created a web version of the exhibition that will serve as a permanent learning tool explaining the construction and social histories of the Canal. Specifically, Library staff:

**1) Created a digital version of the gallery exhibition, *The Land Divided, The World United: Building the Panama Canal* ([panama.lindahall.org](http://panama.lindahall.org))**

The Linda Hall Library's Panama Canal website is based on materials from the A.B. Nichols Panama Canal Collection that were featured in the Library's gallery exhibition, *The Land Divided, The World United: Building the Panama Canal*, on view from April 8 to December 31, 2014.

The A.B. Nichols Collection is a unique archive of original materials devoted to the Panama Canal's history. The archive was donated by Nichol's daughter in 1937 to the Engineering Societies Library in New York. In 1995, the United Engineering Trust transferred most of the contents of the Engineering Societies Library, including the A.B. Nichols Collection, to the Linda Hall Library. Spanning the late 19th century through 1923, the Nichols Collection contains over 1,200 original photographs, 1,300 blueprints and schematics, 100 maps, 250 letters and memoranda, and other items including diaries, postcards, news clippings, and hand-colored sketches and drawings.

Nichols arrived in Panama in May 1904 at the start of construction and remained onsite until the Canal opened in August 1914. The website's content offers visitors a history of the Canal's construction from 1904 to 1914 as seen through the eyes of A.B. Nichols, a highly placed civil engineer. The contents also transcend the Canal's engineering and geologic histories to shed light on social and health-related issues including racial discrimination, living conditions in the Canal Zone across social strata, and the epidemiological challenges of malaria and yellow fever.

Website content and functionality

The Library contracted with The Infusion Group to design and construct the website with content provided by Library exhibition curators. The website's components are divided into three categories: A) essays and images; B) interactive components; and C) reference sources.

**A) Essays and Images:** The exhibition curators wrote 11 essays and selected 10 to 12 images from the A.B. Nichols Collection, supplemented with images from the Library's rare book collection. The essay topics are divided into three subgroups:

**Group 1—A History of the Isthmus:** Beginning in the 16th century, the narrow isthmus between the Atlantic and Pacific Oceans led explorers to search for and propose routes for a passage between the seas. Columbus searched for a waterway across the Isthmus in 1502, followed by Balboa who took a land route across in 1513, and then by Magellan who reached the Pacific via a strait near the tip of South America. In 1811, Alexander von Humboldt proposed nine possible routes for a passage from the Atlantic to the Pacific, sparking a new interest in exploring the Isthmus for a canal route in the opening years of the 19<sup>th</sup> century. The discovery of gold in California in 1848 spiked a keen interest in getting there quickly via a road across Panama. The Panama Railroad opened in 1855, providing a convenient means of crossing the Isthmus. For many, the railroad route also marked the best path for a canal.

Essays and images within this section are:

- **Envisioning a Canal** – History of the Central American isthmus from Columbus’s voyages to the mid-19<sup>th</sup> century.
- **Prelude to the Railroad** – Transportation across and early survey work in Panama prior to the building of a railroad.
- **Panama Railroad** – The railroad’s construction in the 1850s.

**Group 2—the French and U.S. Construction Efforts:** Led by Ferdinand de Lesseps, the engineer who built the Suez Canal, the French began construction of a sea-level canal across the Isthmus of Panama during the 1880s. Beset by inadequate equipment, landslides, financial problems, and the ravages of malaria and yellow fever, the French company abandoned the project in the early 1890s. The U.S. acquired rights to the Canal Zone in 1903, and a year later began the engineering task of building a lock canal 50 miles across the Isthmus. The collection of A.B. Nichols, Office Engineer during the Canal’s construction, illustrates how workers excavated 238,845,587 cubic yards of material, damned the Chagres River, dealt with devastating landslides, and built six massive two-channel locks. Opened on August 15, 2014, the Panama Canal shortened the distance for ocean-going freight and passengers traveling between the U.S. east and west coasts by over 8,000 miles.

Essays and images within this section are:

- **The French Plan** – History of the French plans to build a canal.
- **French Attempt** – Ferdinand de Lessep’s efforts to build a canal.
- **Fighting the Fever** – Control of Yellow Fever and Malaria in the Canal Zone.
- **Making the Dirt Fly** – The American effort begins with an emphasis on sanitation and the building of an infrastructure to support the 10-year construction project.
- **Somebody Dying Every Day** – Culebra Cut was the site of the largest, and most dangerous, excavation work in the Canal Zone.
- **Life in the Zone** – Social and labor history of the Canal’s construction.
- **Locks** – Building the locks and Gatun, Miraflores, and Pedro Miguel.

**Group 3—The Canal's First Century:** Over 1,000,000 ships have transited the Panama Canal in its first 100 years of operation. Engineering improvements over the past century include a widened Culebra Cut, a new dam on the Chagres River, a trans-isthmian highway, two bridges, and a revitalized Panama Railroad. The U.S. also attempted, but ultimately aborted, an expansion project prior to World War II and investigated building a separate sea-level canal. Geopolitical tensions over U.S. presence in the Canal Zone surfaced in the decades following the war, leading to a new Canal treaty signed in 1977 that turned over ownership of the Canal to Panama at the end of the century. Panama began a \$5.2 billion expansion project in 2007 to add a third set of locks. Scheduled for completion in 2015, the project will increase trade throughout the world and will have a direct and positive impact on the U.S. economy, especially the agriculturally focused Midwestern states.

Essays and images within this section are:

- **A Century of Progress** – The Canal's first 100 years of operation, including information on the current expansion project.

## **B) Interactive components**

- **Explore the Timeline:** A scrollable timeline of 56 points of interest from 1502 (Columbus' fourth voyage when he sailed along the Atlantic coast of present-day Panama) to 2007, when construction began on the Third Locks Project. Each point of interest is accompanied by a one to two-paragraph description of the event.
- **Map of the Canal Zone:** Zoomable map of the Canal Zone circa 1912. Clickable buttons at 14 points of interest along the Canal route open to photographs and descriptions of the location.

## **C) Reference sources:** Guides to the people, places, and things associated with the Panama Canal and its history:

- **About A.B. Nichols:** Biographical information on Nichols, a selection of photographs of Nichols while in Panama, and sample images of his notebooks.
- **Who Was Who:** Thumbnail biographies of 40 prominent engineers, explorers, politicians, and other key figures who were involved in the history of Panama or in the building and operation of the Canal.
- **What Was What:** Brief definitions of over 40 place names, landmarks, and other terms associated with the Panama Canal.

- **Maps & Blueprints:** Fourteen blueprints and maps are displayed, such as a blueprint of a Marion steam shovel and a French geological map of the Canal Zone. By clicking on an image, visitors can enlarge the image, learn more about each image, and advance through the entire gallery. Each image caption also has a link to view the item in the Library's digital collection. The website's design enables us to easily add more images to this portion of the website.
- **Bibliography:** A list of sources used by the curators in their research for the exhibition.

**2) Planned and executed a seven-part Panama Canal lecture series attended by over 2,200 people in the Kansas City community.**

Staff selected topics and speakers for the Panama Canal lecture series to give attendees a broad-based knowledge of the Panama Canal and its history. Six of the lectures were funded through the UEF grant.

The lectures were live streamed and videotaped, and have been made freely available to a worldwide audience via links to the Panama Canal website.

The participants in the lecture series and their topics are indicated on the following pages.

## **The Panama Canal Expansion**

Alberto Alemán Zubieta, former CEO, Panama Canal Authority, 1996-2012

April 8, 2014 (exhibition opening lecture)

**About the lecture:** In 2007, the Panama Canal Authority began an ambitious \$5 billion expansion project to add a third set of locks, an undertaking nearly equal in scope to the canal's original construction. Alberto Alemán provided an insider's view of the massive engineering project scheduled for completion in 2015.



From 2000 to 2012, **Alberto Alemán Zubieta** served as the CEO of the Panama Canal Authority, the autonomous agency that manages the Panama Canal. From 1996 to 1999, he served as Administrator of the former Panama Canal Commission, the U.S. agency which was responsible, until December 31, 1999, for the administration and operation of the Panama Canal. A native of Panama City, Republic of

Panama, Alberto Alemán is a graduate of the civil and industrial engineering schools of Texas A&M University.

## **Rails Across Panama: From '49ers to 40-foot Containers**

Peter Hansen, editor, *Railroad History*; and Michael Haverty, Executive Chairman, Kansas City Southern Railway

May 8, 2014

**About the lecture:** Before the Panama Canal, there was the Panama Railroad—and the Canal could not have been built without it. Mile for mile, it may be the most historic railroad on earth: A shortcut for gold-seeking '49ers; the means by which California gold went east; and a key player in the Panamanian revolution of 1903, which set the stage for American involvement with the Canal. Reborn in the 21<sup>st</sup> century as the Panama Canal Railway, it is a joint venture between Kansas City Southern Railway and Mi-Jack Products, North America's leading intermodal terminal operator.



**Peter A. Hansen** has edited *Railroad History* since 2007 and has been a consultant to museums nationwide, including the California State Railroad Museum, the Nevada State Railroad Museum, Kansas City Union Station, and more. He is also a history consultant to multiple Class I railroads, including Kansas City Southern and Amtrak, for which he wrote and hosted the official 40th anniversary film in 2011. He holds a Bachelor of Arts degree in history from Eastern University in St. Davids, Pennsylvania.



**Michael R. Haverty**, a fourth-generation railroader, was named president and chief executive officer of The Kansas City Southern Railway Company in 1995 and held this position until January 2005. After the spin-off of the financial assets division in 2000, he was named president and chief executive officer of Kansas City Southern Industries until 2013.

## **Big-Ship Ready: The Post-Panamax Era**

Geraldine Knatz, Executive Director (retired), Port of Los Angeles

May 20, 2014

**About the lecture:** The current Panama Canal expansion project is a game-changer: the immense post-Panamax containerships will alter global trade routes. Are we ready for a new definition of “big?” Dr. Geraldine Knatz discussed the state of readiness of U.S. ports, the competitive issues between the east and west coasts, and what is likely to happen and why.



**Geraldine Knatz** served as executive director of the Port of Los Angeles for eight years before retiring in February 2014. She oversaw the daily operations and internal management of the nation’s number one container port, including the completion of a \$370 million dredging project in preparation for the new “Post-Panamax” mega-ships. Dr. Knatz earned two degrees from the University of Southern California: a Ph.D. in biological science and a Master of Science in environmental engineering.

## **The Panama Canal Watershed: Science, Commerce, and Sustainability**

Dr. Jefferson Hall, Staff Scientist, Smithsonian Tropical Research Institute, Panama

September 18, 2014

**About the lecture:** The Panama Canal depends on a supply of fresh water, but the state of the Canal watershed reflects a global competition for land, water, and all of the goods and services that provide for a growing population. The Smithsonian’s reforestation work in Panama to protect its valuable watershed is at the intersection of science, commerce, policy, and nature.



**Jefferson Hall** is a staff scientist and forest ecologist at the Smithsonian Tropical Research Institute (STRI) in Panama. His research focuses on understanding the flow of ecosystem services by tropical forests, including the effects of environmental change and land use decisions. At STRI, Jeff leads research on smart reforestation in the Panama Canal watershed. He earned a B.A. in zoology from Miami University, and a Master’s of Tropical Forest Science and a Ph.D. in Tropical Forest Ecology from Yale University.

## **Discovering Fossils in Panama: A Once in a Century Opportunity**

Dr. Bruce MacFadden, Curator and Professor of Vertebrate Paleontology, Florida Museum of Natural History and the University of Florida

October 16, 2014

**About the lecture:** The Panama Canal is currently being expanded on a scale not seen since the original excavations 100 years ago. A team of scientists from the U.S. and Panama, led by Dr. Bruce MacFadden, is capitalizing on these new digs, uncovering important fossil deposits that have revealed a new understanding of ancient biodiversity.



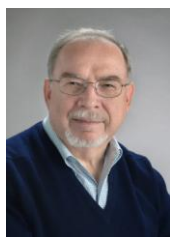
On the University of Florida faculty since 1977, **Dr. Bruce MacFadden** teaches in the biology and geology departments. He is the author of 165 peer-reviewed articles and the book, *Fossil Horses* (Cambridge 1992). With funding from the National Science Foundation his current research interests include collecting fossil mammals along the Panama Canal. Dr. MacFadden received his B.S. degree from Cornell University and his M.Phil. and Ph.D. degrees in Vertebrate Paleontology from Columbia University.

## **American Medicine and the Panama Canal: Miasmas, Mosquitoes, and Malaria**

Dr. Enrique Chaves, University of Kansas Medical Center

December 4, 2014

**About the lecture:** In 1904, Theodore Roosevelt appointed William Gorgas as Chief Sanitary Officer in charge of the sanitation in Panama. Armed with recent knowledge that the mosquito was the vector for yellow fever and malaria, Gorgas converted Panama from a pesthole to a healthy place and made possible the completion of the Panama Canal in 1914.



Dr. Enrique Chaves is a clinical professor and pediatric neurologist at the University of Kansas Medical Center. Dr. Chaves is the author of the recent book *American Medicine and the Panama Canal*, a collection of articles published in the journal *Proceedings of the Canal Zone Medical Association* (1908 to 1927). Dr. Chaves also helped to curate an exhibit, *A Triumph of American Medicine: William Gorgas, Ancon Hospital and the Panama Canal*, at the Clendenen History of Medicine Library at the University of Kansas

Medical Center.

In addition to the above events, the Library was pleased to host a lecture with David McCullough. Though not a UEF-funded event (and we were not allowed to videotape his talk), his lecture is worth noting as part of the Library's Panama Canal lecture series.

### **Building the Panama Canal**

David McCullough, Historian and two-time Pulitzer Prize-winner author  
October 2, 2014

**About the lecture:** The Panama Canal, which opened to the world in August of 1914, represented the most ambitious and costly constructed effort ever mounted until then anywhere on earth. It was an unprecedented work of engineering, but it also changed history in more ways than commonly understood, and its story illustrates profoundly a truth too little appreciated: that history is far more than politics and war only.



Historian **David McCullough** is a two-time winner of the Pulitzer Prize for non-fiction. His story of the Panama Canal, *The Path Between the Seas*, published in 1977, was an instant bestseller, acclaimed by the publishing industry and the historical profession. It was honored with the National Book Award for History, the Cornelius Ryan Award, the Samuel Eliot Morison Award, and the Francis Parkman Prize from the American Society of Historians. It also helped influence history, playing an important part in determining the nation's policy concerning the future of the Canal. It had a profound influence on American policy and public opinion in the late 1970s, as the country debated the future of the Canal.



### Accomplishments achieved

With the completion of Phase I of the Panama Canal website project, the Library has achieved its five educational goals, to:

- *Create an interactive educational tool.* The content and images of the website provide a chronological narrative of the engineering, construction, and social histories of the Panama Canal's construction. The essays begin with early 16th century exploration of the isthmus and continue through to the 21st century Canal expansion project. The essays are geared toward a lay audience and written at an appropriate length to encourage readership among the general public. Interactive components of the website (a map of the Canal Zone and a timeline) are designed to entice users to engage with the material.
- *Create a research tool for advanced scholars.* The digitized A.B. Nichols Collection is a rich archive of maps, blueprints, personal journals, memos, and other primary sources related to the Panama Canal's construction. The website offers scholars an introduction to the collection and provides direct links to the digitized collection.
- *Provide broad access to uniquely held material.* Historian David McCullough, visiting the Library on October 2, 2014, noted while viewing the gallery exhibition that he had not seen many of the photographs and documents on display despite the exhaustive research he conducted while writing his Canal history, *The Path Between the Seas*. The website serves as a permanent access point to this unique material and will provide access to it for untold numbers of scholars in the years to come. The website's user-friendly design and navigation capabilities are intended to accommodate all age groups, providing an easily accessible and attractive entry point to the history of the Canal.
- *Provide broad access to the Panama Canal lecture series.* Videos of the lectures are freely available and easily accessible from the website. The lecture series covers a wide range of topics: the history of the original construction project; the geology and paleontology of the Canal Zone; the Canal watershed; the Panama Railroad; U.S. ports; and the current expansion project. During the past three years, people from 112 countries have viewed Linda Hall Library lecture videos. Similar numbers are expected with the Panama Canal lecture videos.
- *Increase awareness of engineers' role in building the Panama Canal.* The online exhibition (similar to the gallery display) is told through the eyes of A.B. Nichols, Office Engineer during the construction of the Canal. The exhibition is the only online exhibition that tells the story of the Canal's construction from an engineer's perspective. Visitors will also have easy access to links to the digitized Nichols Collection to further explore the engineering aspects of the Canal.

## **Assessment**

The website developers incorporated Google Analytics script into the Panama Canal site's code. Staff will be able to determine the number of visits, where the visitor lives (country and city), and the number of page views.

In 2012, the Library developed a website devoted to the construction of the Transcontinental Railroad. During calendar year 2014 (through the end of November), the railroad website has received over 62,439 visits and 111,721 page views from viewers in 165 countries.

It is expected that the richer content of the Panama Canal website will attract as many, if not significantly more, viewers.

The Linda Hall Library's year-long celebration of the Panama Canal has been one of its most successful public programming ventures to date. That the exhibition website will continue to be a learning tool about the Canal's history and will provide public access to the Library's Panama Canal collection is both a source of deep pride as well as an ongoing responsibility to ensure the continued availability of this historic material.

A breakdown of the allocation of the \$40,000 is included as a separate document accompanied by copies of all vendor invoices.