Historical note
The Lick Observatory was completed in 1888 and continues to be an active astronomy research facility at the summit of Mount Hamilton, near San Jose, California. It is named after James Lick (1796-1876), who left $700,000 in 1875 to purchase land and build a facility that would be home to “a powerful telescope, superior to and more powerful than any telescope yet made”. The completion of the Great Lick Refractor in 1888 made the observatory home to the largest refracting telescope in the world for 9 years, until the completion of the 40-inch refractor at Yerkes Observatory in 1897. Since its founding in 1887, the Lick Observatory facility has provided on-site housing on Mount Hamilton for researchers, their families, and staff, making it the world’s oldest residential observatory.

James Lick was born in Fredericksburg, Pennsylvania in 1796, and spent much of his life building organs and pianos in Pennsylvania and Maryland, as well as in South America. In 1847, he moved to San Francisco, where he started purchasing large amounts of real estate that made him a sizable fortune. Near the end of his life he began discussing ways to leave a legacy in the form of a monument of some kind, and settled on the idea of building something that would advance science, technology, and human knowledge. In 1874, Lick set up the first of three trusts to devote $700,000 to the construction of the most powerful and superior telescope in the world. Richard S. Floyd was the president of the board of trustees of the successful third Lick Trust, and Thomas Fraser was the foreman and superintendent of the entire construction project of the observatory. In August 1875, Lick selected Mount Hamilton in Santa Clara County, California as the site for the observatory after consulting with Fraser. One of the conditions of Mr. Lick’s donation for the observatory was that the County would construct a suitable road to the summit of Mount Hamilton, which the County agreed to do. Lick passed away in 1876 before the completion of the observatory, and was later buried at the base of the pier of the Great Lick Refractor.

As chairman of the board of Lick Trustees, Richard S. Floyd was entrusted with making sure the observatory was the greatest of its time. Having no formal training in astronomy or in the use of its instruments, Floyd recruited astronomers Simon Newcomb and E.S. Holden as scientific advisors in planning the buildings and the astronomical equipment. They invited astronomer S.W. Burnham, well known for his work on double stars, to conduct tests on the atmospheric conditions on the mountain, and he found that the observing conditions were among the most favorable he had experienced.

The main telescope that was initially built at Lick Observatory was the 36-inch equatorial refractor, also known as the Great Lick Refractor, completed in 1888. Alvan Clark & Sons shaped the objective lens, and Warner & Swasey constructed the telescope mounting. With the completion of the Great Lick Refractor and the reconstruction of the Crossley 35-inch reflecting telescope in 1895, the Observatory has been home to some of the world’s most powerful telescopes. Early research at the Observatory made important contributions to the development of instruments for detecting, photographing, and taking measurements of celestial objects. The Observatory continued to pioneer research in the astronomical applications of spectroscopy and photography throughout the 20th century with the addition of the Carnegie 20-inch double astrograph camera (1941) and the Shane 120-inch reflector telescope (1959), which at the time of its construction was the second largest reflector after the 200-inch at Palomar Observatory. As of 2015, Lick Observatory leads in extrasolar and extragalactic research with the Katzmann Automatic Imaging Telescope (1998), which searches for supernovae, and the Automatic Planet Finder (2013), which searches for planets capable of sustaining life.

Some other examples of notable research conducted at the Lick Observatory throughout the decades include the double star survey initiated in 1888 by S.W. Burnham and E.E. Barnard, and continued by director R.G. Aitken and Hamilton Jeffers through the mid-twentieth century, as well as work in radial velocity and spectroscopy started in 1896 by W.W. Campbell, who later became director for almost 30 years. Campbell also oversaw the majority of the Lick Observatory’s solar eclipse expeditions through the early 20th century, traveling to multiple locations in Asia, Africa, Australia, and North and South America to study eclipses in their areas of totality.

The Observatory is currently operated by and headquartered at the University of California, Santa Cruz, and is part of the University of California Observatories (UCO) system. The Observatory was originally transferred to the Regents of the
University of California by the James Lick Trust in 1888, and was an independent campus of the UC system until 1958, when it was made part of the University of California, Berkeley. On July 1, 1965, the administration of Lick Observatory was officially transferred from UC Berkeley to UC Santa Cruz, and the following year the astronomers relocated their offices and residences to Santa Cruz, along with the astronomy shops, materials from the observatory’s library, and historical documents that made up the archives of the observatory. Mary Lea Shane served as the custodian of the archives both on Mount Hamilton and at UC Santa Cruz, preserving and indexing the correspondence, logs, business records, photographs, and research materials from the observatory’s history. In 1982, a ceremony was held at the library to name this collection the Mary Lea Shane Archives of the Lick Observatory. These records are now available as the Lick Observatory Records, collection UA 36, in the Special Collections and Archives department of the UCSC McHenry Library.

For additional references with more information on the Lick Observatory and its history, see the Bibliography section of this finding aid.

Preferred Citation
Lick Observatory Records: Expeditions. UA 36 Ser.4. Special Collections and Archives, University Library, University of California, Santa Cruz.

Related Materials
Related materials can be found in the following series of the Lick Observatory Records and separate collections:

- UA.036 Series 1: Correspondence
- UA.036 Series 2: Business records
- UA.036 Series 3: Directors’ files
- UA.036 Series 5: Research and Publication files
- UA.036 Series 6: Glass negatives
- UA.036 Series 7: Photographs
- UA.036 Series 8: Lick History
- MS.268: Elizabeth Ballard Campbell papers

Scope and Contents
This series contains records relating to the eclipse expeditions of Lick Observatory staff, as well as the D.O. Mills Expedition to establish and operate a southern-sky observatory in Chile. Materials include correspondence, planning and financial documents, maps, reports, news clippings and press releases, and some photographs.

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- *The Lick Observatory Collections Project: Building the Observatory*. http://collections.ucolick.org/archives_on_line/bldg_the_obs.html
Eclipses 1869-2001

Scope and Content
These materials mostly contain planning documents, administrative materials from the expeditions, and some research materials from the solar eclipses. A large amount of correspondence is included, mostly from W.W. Campbell, as well as reports, financial documents, orders, inventories, maps, and some photographs.

History
The solar eclipse program at the Lick Observatory was spearheaded by William Wallace Campbell in the late 19th and early 20th centuries, and made the Lick Observatory well known in the field of astronomy. Campbell led many of the eclipse expeditions himself, traveling the world, and several were funded by either Charles F. Crocker or his brother, William H. Crocker.

The following eclipse expeditions were taken by Lick staff as part of the solar eclipse program:
Bartlett Springs/Cloverdale, California, USA: January 1, 1889
Cayenne, French Guiana, South America: December 21-22, 1889
Mina Bronces, Chile: April 16, 1893
Akashi, Japan: August 8, 1896
Jeur, India: January 22, 1898
Thomaston, Georgia, USA: May 28, 1900
Padang, Sumatra: May 18, 1901
Labrador, Canada: August 30, 1905
Aswan, Egypt: August 30, 1905
Alhama de Aragon, Spain: August 30, 1905
Flint Island, South Pacific: January 3, 1908
Brovary, Russia (now Ukraine): August 21, 1914
Goldendale, Washington, USA: June 8, 1918
Wallal, Australia: September 21, 1922
Ensenada, Mexico: September 10, 1923
Bangkok, Siam (now Thailand): May 9, 1929
Camptonville, California, USA: April 28, 1930
Fryeburg, Maine, USA: August 31, 1932

Arrangement
The materials in this section are arranged chronologically by eclipse date, with each eclipse expedition having its own file. Other eclipse files are arranged at the end of this section, again chronologically.
Eclipse of January 1, 1889: Bartlett Springs, California

History
Lick director Edward S. Holden organized this eclipse expedition and sent a team of astronomers to Bartlett Springs, California, with James Keeler leading the group. Also part of the Lick team were E.E. Barnard, Charles B. Hill, and Armin O. Leuschner. The wide interest garnered from this eclipse and the proximity of the area of totality to the Lick Observatory was an impetus for director Edward S. Holden to establish the Astronomical Society of the Pacific in February 1889. During this eclipse, E.E. Barnard secured the clearest photograph of any solar eclipse to date.

Eclipse of December 21, 1889: Cayenne, French Guiana

History
S.W. Burnham and John M. Schaeberle led this expedition to French Guiana, which was funded by Charles F. Crocker, a prominent banker and member of the University of California Board of Regents.

Eclipse of April 16, 1893: Mina Bronces, Chile

History
John M. Schaeberle went on this expedition alone to Chile, which was funded by Phoebe A. Hearst, and enlisted the help of local Chileans and British naval officers to assist with the equipment.

Eclipse of August 8, 1896: Akashi, Japan

History
John M. Schaeberle went on this expedition, which was funded by Charles F. Crocker. No results were gathered due to completely cloudy skies on the day of the eclipse.

Eclipse of January 22, 1898: Jeur, India

History
William Wallace Campbell led this expedition to Jeur, India, where he observed his first eclipse. He and his wife, Elizabeth Ballard Campbell, traveled westward by ship to India and enlisted volunteers to help with the instruments when they arrived. After the eclipse, the Campbells kept traveling west and completed a trip around the world.
Eclipse of January 22, 1898: Jeur, India

Report by W.W. Campbell 1898
Scope and Contents note

Eclipse of May 28, 1900: Thomaston, Georgia

History
Director James Keeler raised money from William H. Crocker to fund this expedition, which was led by Campbell along with Lick secretary/astronomer Charles D. Perrine and volunteer Heber D. Curtis.

Eclipse of May 18, 1901: Sumatra

History
Director Campbell did not go on this expedition, and sent Perrine in his place. The expedition was funded by W.H. Crocker.

Correspondence 1901
Scope and Contents note
Also includes insurance policies and bulletins.

Clippings 1901
Report by C.D. Perrine 1901
Scope and Contents note
Lick Observatory Bulletin no. 9.

Eclipse of August 30, 1905

History
Three separate expeditions from Lick Observatory were made for the August 30, 1905 eclipse, all funded by W.H. Crocker. Campbell was in charge of all the expeditions and personally traveled to Spain with Perrine and Mrs. Campbell. H.D. Curtis and Joel Stebbins went to Labrador in Canada, and William J. Hussey went on the expedition to an island in the Nile river near Aswan, Egypt. None of the astronomers gathered sufficient data at any of the three expeditions due to relatively poor conditions.

Labrador, Canada
Correspondence 1904-1906
Expenses 1905
Research notebook 1905
Scope and Contents note
Logbook of notes and calculations from eclipse site at Cartwright, Labrador, Canada.

Aswan, Egypt
Correspondence 1904-1906
Expenses 1905-1906
Scope and Contents note
Includes list of estimated expenses and expense reports.

Reports 1905
Alhama de Aragon, Spain
Bills and receipts 1905-1906
Eclipse of August 30, 1905

Campbell led this expedition to Flint Island in the Pacific Ocean, and was accompanied by Mrs. Campbell, C.D. Perrine, Robert G. Aitken, Sebastian Albrecht, and E.P. Lewis. The expedition was funded by W.H. Crocker.

Bills and receipts 1907-1908
Correspondence 1908
Scope and Contents note
Also includes manuscripts of reports and clippings.

Diary of Robert G. Aitken 1907-1908
Employee contracts 1907
Personnel lists 1908
Report by F.K. McClean 1908

Eclipse of August 21, 1914: Brovary, Russia (Ukraine)

Campbell led this expedition and brought his family with him, along with H.D. Curtis to assist with the observation of the eclipse. W.H. Crocker funded the expedition. Weather conditions were unfavorable on the day of the eclipse and no observations were able to be made. World War I began while the team was in Russia, and they were able to travel safely back to America through Scandinavia. The telescopes and other equipment had to be left behind in Russia and were not returned for another few years.

Campbell family visas 1914
Clippings and press releases 1914
Scope and Contents note
Includes account by Elizabeth Ballard Campbell published in San Francisco Chronicle.

Correspondence 1913-1918
Scope and Contents note
Includes W.W. Campbell's letters of preparation as well as correspondence regarding the return of equipment from Russia in 1918 before the Goldendale expedition.

Report by W.W. Campbell and H.D. Curtis 1914

Eclipse of January 3, 1908: Flint Island

Campbell led this expedition to Flint Island in the Pacific Ocean, and was accompanied by Mrs. Campbell, C.D. Perrine, Robert G. Aitken, Sebastian Albrecht, and E.P. Lewis. The expedition was funded by W.H. Crocker.

Bills and receipts 1907-1908
Correspondence 1908
Scope and Contents note
Also includes manuscripts of reports and clippings.

Diary of Robert G. Aitken 1907-1908
Employee contracts 1907
Personnel lists 1908
Report by F.K. McClean 1908

Guide to the Lick Observatory
Records: Expeditions
UA.036.Ser.04
**Eclipse of June 8, 1918: Goldendale, Washington**

**History**
Campbell led this expedition to Goldendale, Washington, where he planned to measure the gravitational deflection of light from stars around the sun, which would test Einstein's newly published theory of relativity. Present at the eclipse were H.D. Curtis; Ambrose Swasey, whose company built the 36" Lick refractor; John Brashear, who built much of the Lick equipment; foreman John Hoover; and W.H. Crocker, who funded this and many other eclipse expeditions.

**Bills and receipts 1918**

**Clippings 1918**

**Correspondence 1916-1918**
Scope and Contents note
Includes W.W. Campbell's letters of preparation.

**Reports by W.W. Campbell and J.H. Moore 1918-1919**

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**Eclipse of September 21, 1922: Wallal, Australia**

**History**
Campbell led this expedition to Australia with Robert J. Trumpler, who took comparison star field plates in Tahiti before the eclipse, and J.H. Moore, along with Mrs. Campbell. It was during this eclipse that Campbell and Trumpler were able to successfully measure the gravitational deflection of light from stars near the sun, supporting Einstein's theory of relativity.

**Clippings 1922**
Scope and Contents note
Includes news clippings, scrapbook, and some photographs.

**Correspondence 1919-1937**
Scope and Contents note
Includes letter from secretary of Albert Einstein.

**Expenses 1920-1923**
Scope and Contents note
Includes bills, receipts, and expense reports.

**Proposed program of eclipse expedition 1922**
Scope and Contents note
Includes Campbell's plans for the schedule and program of the Wallal expedition.

**Reports by W.W. Campbell 1922**

**Shipment lists, reports, and notes 1922**

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**Eclipse of September 10, 1923: Ensenada, Mexico**

**History**
Director Campbell put William H. Wright in charge of the expedition to Ensenada, Mexico, and decided soon before the eclipse to travel to Ensenada as well. Also in attendance were J.H. Moore, Robert Trumpler, Hamilton Jeffers, and the Campbell family. Cloudy and stormy conditions on the day of the eclipse prevented the astronomers from gathering any useful data.
### Eclipses of September 10, 1923: Ensenada, Mexico

**Scope and Contents note**
- Correspondence 1919-1924
  - Physical Description: 6 folders
  - Scope and Contents note
  - Also includes reports and some financial documents.

### Eclipse of May 9, 1929: Bangkok, Siam (Thailand)

**Scope and Contents note**
- Includes reports, charts, maps, weather information, and some loose photographs.

### Eclipse of April 28, 1930: Camptonville, California

**Scope and Contents note**
- Includes correspondence and planning documents.

**History**
- Director Robert G. Aitken sent a team including J.H. Moore, C. Donald Shane, and Donald H. Menzel to observe the solar eclipse in Camptonville, California.

### Eclipse of August 31, 1932: Fryeburg, Maine

**History**
- William H. Wright, J.H. Moore, C. Donald Shane, and Donald H. Menzel were part of this eclipse expedition to Fryeburg, Maine.

### Other eclipses 1869-2001

**Scope and Contents note**
- Includes general files on eclipse viewing as well as files on specific eclipses before 1888 that were not part of Lick expeditions.

### General files 1907-2001

**Scope and Contents note**
- These materials include lists of eclipses; a postcard showing the partial eclipse of June 17, 1909; instructions for making observations of eclipses by Edward S. Holden; a 1979 publication on the Lick Observatory solar eclipse expeditions by Donald Osterbrock; and general correspondence regarding the Lick eclipse expeditions.

### Eclipse of August 8, 1869: Springfield, Illinois

**Scope and Contents note**
- Includes maps of area of totality.
Eclipses 1869-2001

Other eclipses 1869-2001

Box 6, folder 15

**Eclipse of December 22, 1870: Jerez, Spain**

Scope and Contents note
Includes sketches of solar eclipse.

Box 7, folder 11

**Eclipse of May 6, 1883**

Scope and Contents note
Includes handwritten account of the eclipse, most likely from a French expedition.

**D.O. Mills Expedition 1874-1980**

Arrangement
The materials in this section are arranged alphabetically by subject, then chronologically.

Scope and Content
These materials cover the D.O. Mills Expedition to Santiago, Chile in the early 20th century. They include correspondence between W.W. Campbell and his colleagues, expense reports and other financial information, reports on the history and the progress of the project, and research materials from the observatory site in Chile.

History
At the beginning of his directorship at Lick Observatory, W.W. Campbell decided to establish a temporary observatory in the southern hemisphere in order to gain a more complete view of the sky in the Lick astronomers' research. In 1903, he organized an expedition to Chile which was funded by Darius Ogden Mills, a wealthy member of the first Lick Trust. Campbell sent his assistant William H. Wright and Harold K. Palmer to find a suitable site for the observatory, and they selected Cerro San Cristobal, a small hill near Santiago, Chile. Wright and Palmer had the dome constructed and the reflector telescope and spectrograph set up within a few months, and started taking spectrograms at the end of 1903. Lick staff were involved in conducting research at this observatory until 1929, when the program for which the observatory was built concluded, and the observatory and equipment were sold to the Catholic University of Chile.

**Correspondence 1874-1929**

Scope and Contents note

Box 8, folder 1

**Arrangements 1901-1903**

**D.O. Mills 1874-1912**

Scope and Contents note
Contains correspondence of D.O. Mills with Lick Observatory staff and directors including E.S. Holden, James Keeler, and W.W. Campbell.

Box 8, folder 4

**Mills Fund 1905-1915**

Box 8, folder 5-7

**General correspondence 1903-1905**

Box 9, folder 1-6

**General correspondence 1906-1911**

Box 10, folder 1-8

**General correspondence 1912-1919**

Box 11, folder 1-4

**General correspondence 1920-1929**

Box 11, folder 5

**Diaries 1903, 1928-1929**

Scope and Content
Includes a 1903 diary of telescope operations and tests in San Diego, and F.J. Neubauer's diary of expenses and notes at the Chile station from 1928-1929.
box 12, folder 1-5, box 11, folder 6

**Expenses 1906-1928**

Scope and Contents note
Includes vouchers, receipts, and correspondence regarding expenses.

box 12, folder 6

**History circa 1894-1980**

Scope and Contents note
Includes report by W.W. Campbell, Chilean magazine with article on the Mills telescope, research correspondence, and other reports and notes.

box 12, folder 7-8

**Reports 1905-1909**

Scope and Contents note
Includes reports of the expedition by W.W. Campbell and W.H. Wright, as well as a site survey report of Copiapo with maps and photographs.

box 12, folder 9-11

**Research 1913-1923**

Scope and Contents note
Includes R.E. Wilson's research on southern nebulae, corrected data from plates, and measurement logs.
Albert Einstein correspondence and related publications 1913-1958

Scope and Content
These materials contain publications written on Einstein's theory of relativity, as well as correspondence among Lick staff regarding the results of the eclipse expeditions at which the theory was tested. Included is a handwritten letter from Albert Einstein to W.W. Campbell responding to Trumpler’s article refuting Freundlich's claims made at the Potsdam Observatory, and thanking the Lick staff. Other correspondents include Elsa Einstein (wife of Albert), Mrs. Elizabeth Ballard Campbell, R.G. Aitken, and Robert Sproul. Text from the speeches given by Campbell and Einstein at the 1931 dinner in Einstein's honor at the California Institute of Technology are also included. The publications on relativity are by Sir Edmund Whittaker, Leopold Infeld, and Oliver Lodge.

History
Albert Einstein's work in physics had a significant role in the eclipse expeditions of the early 20th century that W.W. Campbell oversaw. Einstein had published his special theory of relativity in 1905, and the general theory of relativity 10 years later, and subsequently predicted that the gravitation of a large mass (e.g. the sun) would bend light rays passing near it. He suggested that a way to measure this prediction would be to observe the positions of stars near the sun during an eclipse, when the sky is relatively dark, and compare these measurements to the positions of the same stars later in the night sky, when the sun is gone from the local field.

During the Lick expedition to Wallal, Australia, for the September 21, 1922 eclipse, Campbell and astronomer Robert Trumpler were able to gather enough data and conduct the measurements that strongly supported Einstein’s predictions and hence the theory of relativity. After this result was announced, most scientists around the world regarded it as convincing evidence, except for T.J.J. See, an astronomer who disagreed with Einstein's theory and predictions. In response, Trumpler published an article in the Publications of the Astronomical Society of the Pacific which refuted each claim made by See. Later, after the eclipse of 1929, when astronomer E. Finlay Freundlich released measurements which called into question the prediction of light deflection, Trumpler again responded in Publications of the Astronomical Society of the Pacific disproving these claims and supporting Einstein's theory of relativity. Einstein personally wrote a letter in February 1932 to Trumpler and Campbell thanking them for their support and work, and discussing the scientific merit of the claims.