



THE CHINA LAKER

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Special points of interest:

- Who was Dr. Ira Bowen?
- CLMF 15th Annual Auction
- Presidential Timeline

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Who was: Dr. Ira Sprague Bowen?

By Jack Latimer

As you enter the Naval Air Weapons Station at China Lake, home of the Naval Air Warfare Center Weapons Division, through the main gate heading east on Inyokern Road, the first parallel street to the south is Bowen Avenue; it runs from Kimball Road east to South Lauritsen Road, then takes a jump to the other side of Mirror Lake and runs out to the horse corals. It used to be lined with Old Duplex houses, but now is mostly deserted.

The road is named after Dr. Ira Sprague Bowen (Dec. 1898 – Feb. 1973). Why does Dr. Bowen have a road named after him at China Lake? Dr. Ira Bowen was one of the



outstanding Physicists and Astronomers of the twentieth century. He helped discover evidence that led to the concept of electron spin in the vector model of the atom. He was responsible for completion of the 200-inch Hale Telescope. For eighteen years he was the director of the Mount Wilson and Mount Palomar observatories. In December 1943 Dr. Bowen was also the man who filmed the very first rocket tests at the newly established Naval Ordnance Test Station at Inyokern.

The son of a New England pastor who later became business agent of the Wesleyan Methodist Church, Ira (nicknamed Ike) grew up in New York and Pennsylvania. Early on he was home-schooled by his mother, a licensed New York State teacher, and later continued his education at Houghton

Wesleyan Methodist Seminary where his mother obtained a position after the death of his father in 1908. Ira was very interested in popular science. He graduated from high school in 1915, and was valedictorian of his small class of seventeen. His first three years of college continued at the Houghton Seminary and he finished his senior year at Oberlin College, receiving his AB degree in 1919. He was awarded a scholarship and took up graduate studies at the University of Chicago. During his two years at Chicago he attended all of a comprehensive group of classical physics courses taught by Albert A. Michelson (for which Michelson Lab is named at China Lake) and modern physics taught by R. A. Millikan.

(continued, page 2)

President's Message

CLMF Committees are working hard and accomplishing much. We have a number of leaders on the BoD who have the "China Lake Way" mentality of getting the job done, now that the purchase of the new Office Building in the Marriott Complex is our new

goal. It has made a world of difference in the motivation for volunteering as well as financing of the building, especially at the Founder's Program \$5,000 donation level which seems to be the number the "old China Lakers" are comfortable with. Young China Lake

families, as Founders, should especially like having free Lifetime access to the new Museum for their household family members. With the Founders Program and the first Campaign to build a new building combined, we have about \$500K toward our First

Who was: Dr. Ira Sprague Bowen? (continued from page 1)

In 1921 Millikan moved to the California Institute of Technology (CalTech) and persuaded Bowen to move with him and become his assistant. During his first year at CalTech Bowen taught a course in general physics and worked with Millikan on cosmic rays. Bowen continued undergraduate teaching of physics until 1929, when he took over the teaching of graduate courses in optics and spectroscopy. He became an assistant professor of physics in 1926, associate professor in 1928, and professor in 1931. He had obtained his PhD degree in 1926 by which time he had already published some twenty articles. Bowen accepted an invitation in 1938 to spend a summer at the Lick Observatory where he conducted his first real observational work in astronomy. Bowen made many contributions to astronomy such as developing procedures to cut exposure times in half for astronomical photography and a device to improve efficiency in recording the spectra of stars or nebulae. In the 1930s, Bowen made contributions to the design development of the 200-inch telescope to be installed at Mount Palomar. The entry of the United States into World War II put a hold on the Palomar and other telescope projects and on the academic careers of many professors at CalTech.

CalTech became involved with a project to design, develop, test and produce solid fuel rockets for immediate use by the Navy, and Bowen accepted responsibility for exterior ballistics on the rocket projects, under the direction of CalTech physicist Charles C. Lauritsen with W. A. "Willy" Fowler second in command. Bowen organized the photographic section and for nearly four years guided and participated in the fieldwork and analysis needed to provide precise data on rocket acceleration, stability, trajectory, blast effects, and other parameters. Thousands of rocket tests were monitored from ground and from the air. On other wartime projects not connected with rockets, Bowen contributed to the development of high explosive devices by inventing cameras capable of cinematography at

Bowen organized the photographic section and for nearly four years guided and participated in the fieldwork and analysis needed to provide precise data on rocket acceleration, stability, trajectory, blast effects, and other parameters.

unprecedented shutter rates. Much of the early propulsion work was done at Eaton Canyon near Pasadena and rocket testing was done at Goldstone near Fort Irwin. Accidents at Eaton Canyon and the lack of adequate space at Goldstone led CalTech and the Navy to search for a larger more remote area in which to conduct the rocket program.

On a preliminary small aircraft reconnaissance flight they discovered an airfield and largely empty valley near Inyokern, CA. In October 1943 Charles Lauritsen sent Ira Bowen, W. A. Fowler and Wesley W. Hertenstein on a ground reconnaissance of the Indian Wells Valley in a four-wheel drive vehicle to determine the suitability of the area for rocket testing and future development of a permanent site to transfer the rocket work from CalTech to the Navy after the war. The team photographed the area and recorded their findings on a map of the area and later laid out a proposed location for a ground range encompassing the dry lake area. The area was deemed ideal for the rocket testing facility. The Navy subsequently acquired some 650 square miles in the area and began constructing and, a year later, another 350 square miles were added.

Contributions by Bowen to photographing rocket tests and explosive warhead photography were extraordinary. He invented the CZR-1 Ribbon Frame Camera which tracked the missile during the first 1,000 feet of launch and provided photographs of the missile along a predetermined flight path. CZR-1 cameras were used for years in ballistic missile testing programs and were still being used in 1986 by NASA to compile photographic data on the Space Shuttle Challenger accident.

In August 1945 Vannevar Bush, who headed the wartime Office of Scientific Research and Development, traveled from Washington D. C. to New Mexico

to witness the first nuclear explosion, and continued to the West Coast and, in his other capacity as president of the Carnegie Institution, stopped in Pasadena to tell Bowen he had been appointed director of the Mount Wilson Observatory. In 1948 he was appointed director of the combined Mount Wilson and Palomar Observatories, where served until 1964. Dr. Bowen epitomizes the pioneering spirit of those early CalTech scientists who put their academic careers on hold during World War II and built the framework for what is now the Naval Air Warfare Weapons Division.

References:

1. *Ira Sprague Bowen 1898-1973; A Biographical Memoir* by Horace Babcock; National Academy of Sciences, 1982
2. *Sailors, Scientists, and Rockets*. History of the Naval Weapons Center, China Lake, California, Vol. 1, p.182-185, p. 216

NOTE: The article "The Counterfeit Harpoon" that appeared in the previous edition of The China Laker was submitted by Dale Knutsen, who was an integral part of the Harpoon program from the Validation Phase in 1969 through Fleet introduction in 1977. His introductory paragraph mentioned primary China Lake tasks at the time of the episode described. Over the course of the subsequent three decades China Lake's role evolved and included additional important assignments. The China Lake Harpoon history is under development for forthcoming newsletter(s) by key engineers and scientists who still live to tell their story."

CLMF 15th ANNUAL DINNER & AUCTION

It is that time of the year again! The members are busy planning for our biggest fundraiser of the year, the Annual Auction. We are asking all members to consider volunteering for some part of the program. We need all hands on deck.

The theme this year is: China Lake's Firsts. With all that has been accomplished on the Base since 1943 you know there are a lot of firsts to explore. You may be surprised by some of the firsts that have been



Sidewinder
The "Offspring" of China Lake First

developed on-site.

Please consider donating items for the auction. Or soliciting items from friends or business owners you know.

As a first year member (see, a first) I am looking forward to being your Auction Chair. Teri is busily whipping me into shape so that we can have a successful program. The design for the program, tickets, and flyers will be completed within the next two weeks.

Date: 30 May 2015
 Place: Kerr McGee Center
 Ridgecrest, CA
 Time: 5:00PM
 Price: \$30 per Ticket
 \$50 per Couple
 \$250 Reserved Seating for 2
 \$1000 Family Table for 8
 \$1500 Corporate Table for 8
 Call (760)939-3530 to purchase tickets or visit Chamber of Commerce.
 Stay tuned for more updates...
 B Moody

Spotlight: CLMF Business Members

They appreciate your support also

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The newsletter will be sent electronically. You may email us at chinalakemuseum@mediacombb.net. Please put in the subject line "Electronic Newsletter."

If you would like to receive it via USPS, please let us know, (760) 939-3530.

President's Message (con't)

Phase Goal of \$2 million to purchase and complete the downstairs of the building for move-in. We also have additional discretionary funds saved for a cushion to support this effort. Just 500 of us with wonderful China Lake retirements, can make this happen! Please help us! Also, help us get the word out to others who can see this as a priority for recording and presenting the world changing history of China Lake!

The **Building Purchase Strategy Committee**, headed by Toni Damiano, is working on negotiations with a key partner and the City of Ridgecrest for purchase of the building and outdoor display property. He is attempting to satisfy all parties' needs which are complex and challenging. It would be easy if we already had the money. Our primary focus is moving into the building as quickly as possible, which will involve completing some construction of the downstairs floor while establishing the process with the Navy for moving artifacts to the Ridgecrest building. A Financial Spreadsheet originated by Elsa Hennings and with the Committee's inputs will define our cash flow well enough to secure a loan if needed. Bob Campbell has completed a Business Plan revision to include options for this building which will be thoroughly vetted.

Director Emeritus Jack Latimer is now Chair of the **History Committee** and has written one page Commander-In-Chief Timelines for use in the new Museum outlining key NOTS and China Lake contributions under each Presidential Term. We will be featuring one in each newsletter until we cover all 13 Presidents.

For the **Building Committee** headed by Wayne Doucette, our architect Russ Tyner of Houston/Tyner Architects, Torrence CA, has donated a layout for the downstairs of the Office building, to be used to solidify

our plans for space for the Gift Shop and key displays as well as using the downstairs for important educational and social events.

The **Finance Committee** and our new Treasurer Chris Toftner are working with our CPA Barbara Agerton of Tax Time Services. They are making the transition from past Treasurer Dr. Craig Porter's detailed tracking of our finances.

The **Marketing Video Committee** chaired by Bob Peoples, VP of Public Relations, are solidifying requirements documented by new BoD member Rich Bruckman and Scott Millett for the upcoming video to be used to market the new building. When completed by a local bidder, it will be available as a YouTube resource easily accessible by anyone on the web and will help get the word out to potential donors who are less familiar with China Lake's history and/or aren't able to get a tour of the building.

The **Operations Committee** now headed by our new VP of Operations Pat Doucette has purchased and leased new office equipment to save newsletter and other printing costs. With new software DonorPerfect, we will have a more reliable resource to use to track data and actions associated with membership, donors, events, grants and all other financial transactions, along with Quickbooks, which is our basis for handling taxes. The Foundation has much going on for our only full time paid staff member Office Manager, Teri Raley, to keep track of. Pat's history and experience after taking several years off as a very active volunteer was clearly missed, so it's a true blessing we have her back!

The **Dinner Auction Committee**, chaired by new BoD Member Bettye Moody, is announcing May 30, 2015 for our major annual fundraising event with the theme "China Lake Firsts" which are numerous and amazing! We need

your auction item and cash donations to make this event as fun and exciting as always!

Our volunteers and docents (tour guides) are key and we need more! Please consider volunteering by calling Lynn McIntire at the Office 760-939-3530. She will be able to point you in the right direction for much needed help either in the Museum or in support of one of our Committees. Thank you for your generous support in time and finances for this important cause!

Alice Campbell
President
China Lake Museum Foundation

Commander-in-Chief Support for Franklin D. Roosevelt 1943-1945

Major Contributions of CalTech/Naval Ordnance Test Station (NOTS)

1. Problem: The Navy urgently needed a remote location where they could develop and test aircraft rockets for immediate use by the fleet in attacking ships, submarines, aircraft and land targets from aircraft. Early development and testing were conducted at Eaton Canyon near Pasadena and at Goldstone Lake near Barstow, but Eaton was too near populated areas and Goldstone was not large enough.

Solution: Land was acquired in the remote, sparsely populated Indian Wells Valley 150 miles northeast of Los Angeles and the Naval Ordnance Test Station (NOTS) was established under the Navy's Rocket Program led by the California Technical Institute (CalTech). NOTS developed, and tested and introduced to the fleet a variety of rockets, establishing aircraft- and ship-fired rockets as major weapons of war.

2. Problem: The Manhattan Project (Atomic Bomb) urgently needed a remote location to develop and test components for, and conduct the necessary ballistic tests, to finalize the atomic bomb into a deliverable weapon, and to train flight crews on how to handle and deliver the bomb.

Solution: Professional connections between the scientists on the Manhattan Project and those on the Navy's CalTech

Rocket program provided a workable solution by moving much of the weaponization work (ballistics, training, etc.) and development of a pilot production plant for conventional explosive components on the Atomic Bomb to a remote location at NOTS and using the established Rocket program's contracting apparatus to secretly acquire much needed



materials for the Atomic Bomb under the guise of the Rocket project, helping to preserve security of the Manhattan Project.

3. Problem: The 5" Forward Firing Aircraft Rocket was essentially a 5" artillery warhead attached to a 3.5" rocket motor. While the warhead greatly improved the on-target effects, the extra drag and weight cut flight velocity and accuracy. A 5" rocket motor was needed to increase velocity and accuracy.

Solution: From inception to combat use in less than 6 months a new rocket was designed, tested and deployed. The 5" High Velocity Aircraft Rocket, nicknamed Holy Moses, the first brand-new rocket to be air-tested at China Lake was 200 feet per second faster than the 3.5" rocket. Holy Moses established a new leadership for the United States in aviation ordnance that would be maintained for decades to come. Aircraft now had far greater striking power than ever before,

the equivalent of a 5" shell in each rocket. It proved enormously effective against small targets such as submarines, destroyers, shipping, anti-aircraft positions, ammunition and oil storage dumps, tanks and locomotives. Described by one Army WWII general as "the best antitank weapon of the war."

4. Problem: A ship-launched barrage rocket system was needed by the Navy to soften up and neutralize beaches for amphibious landings.

Solution: The ship-launched 4.5" Spin-stabilized barrage rocket developed by CalTech saw action in every amphibious landing in Europe and in all those in the Pacific beginning with the invasion of Arawe Island, New Britain in December of 1943. These rockets were used to neutralize enemy defenses and clear hazardous landing areas. They established the basis for all future land-clearing systems.

Build Yourself a Legacy!



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**Join the China Lake Family!
Help The China Lake Museum
Foundation purchase this building in
front of the Marriott!**

**Become a Founder today for \$5,000!
Or a Benefactor for more than \$5,000
with naming rights!**

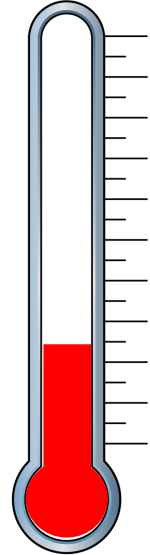
**Founders, Benefactors, and
Business Partners
will help our community realize
"The Dream".**

**Help move the "Secret City's" Museum
into the City of Ridgecrest,
where it won't be such a secret anymore.**

Questions?

**Call John Freeman (760) 382-7776,
Bob Campbell (760) 377-7085 or
Wayne Doucette (760) 447-1484**

**"First Phase"
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China Lake Founder/ Donor/Contributor Pledge Agreement

- Founder (\$5,000 or more)** - I pledge \$_____ to the China Lake Museum Foundation.

I understand that my name (or a name designated by me) will be added to a Founder's Plaque in the Museum. I also understand that I will be given the opportunity to document my China Lake story, which will be incorporated as a permanent part of the Museum history. A complimentary life membership (if not already a life member) and future "Founders Club" benefits will be included. Benefactor Founders (over \$5,000) will be given opportunities for naming rights commensurate with the amount pledged. If you prefer to pay in installments please indicate by filling out the information below.

- Donor (\$1000 - \$4999)** - I pledge \$_____ to the China Lake Museum Foundation.

I understand that my name (or a name designated by me) will be added to a List of Donors in the Museum.

- Contributor (less than \$1000)** - I pledge \$_____ to the China Lake Museum Foundation.

We, the undersigned, agree that this pledge will not be called due until such time as the Foundation executes a purchase agreement for the Marriott Business Building. When my pledge is called due by order of the Board of the China Lake Museum Foundation, I agree to make payment in full or in installments as agreed to below within thirty (30) days of the "call" which will be made by certified mail. I understand the pledge and subsequent donation identified as part of this agreement will be used in support of the purchase of the building, and land parcel, development of the building and plaza into the Museum complex, relocation and refurbishment of existing exhibits and development of new exhibits, and to sustain operations of the Museum in its new location. I understand that none of this pledge and subsequent donation will be used to pay a commission to any volunteer, employee or agent of the China Lake Museum Foundation.

Signature	Printed Name	Date	Phone Number
Address (Street, City, State, Zip)			Email
Foundation Signature	Printed Name	Date	Title

- I, _____(initial) authorize the China Lake Museum Foundation to acknowledge my pledge and subsequent donation within the museum and in museum publications.
- I, _____(initial) wish to keep my pledge and subsequent donation anonymous.
- I, _____(initial) wish to make this pledge and subsequent donation in the name of: _____
- I, _____(initial) wish to fulfill my pledge with annual installments of \$_____ over a period of _____ years (three (3) years or less preferred) and authorize the CLMF to bill me each year on the anniversary of the call for payment of pledges.

Please submit signed pledge form to CLMF, PO Box 217, Ridgecrest, CA 93556.

No goods or services are provided for this donation. Your donation is tax deductible to the fullest extent of the law for this non-profit 501(C)(3) organization, Tax ID #77-0340083.

Thank you for your support in preserving the heritage of China Lake and especially those individuals who over the past seven decades have contributed to the defense and freedom of our great Nation.

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- \$10 \$200 \$500
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Your gift is tax deductible to the fullest extent of the law for a 501(C)(3) organization. Tax ID #77-0340083.

For checks intended for the new building "Founders Program", please use the form included in the newsletter. Otherwise, the other monies will be used were most needed.

Name: _____

Address: _____

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State: _____ Zip: _____

Phone: _____

Email: _____

Enclosed is my Check Visa MasterCard Other _____

Card Number: _____

Expiration Date: _____ CVC: _____

Signature: _____

Or call (760) 939-3530 to make your credit card donation.