

Some Memories of My Grad-Student Days at Cal Tech

Recalled by Dick Crane August 28, 2001

Enhanced with photos and historical information by his daughter Carol Crane Kitchens



Cal Tech began as a vocational school in Pasadena in 1891. By the late 1920's it had a graduate school offering doctoral degrees in physics, chemistry, engineering, geology, aeronautics, biology and mathematics. Physics was the king from the very beginning. It had more students, more faculty, and more money than any of the other departments. Physicist Robert A. Millikan served as "Chairman of the Cal Tech Executive Council" from 1921 to 1945 and he initiated a visiting-scholars program. The list of scientists who accepted Millikan's invitation represented the cream of European physics, including Paul Dirac, Erwin Schrödinger, Werner Heisenberg, Hendrik Lorentz, and Niels Bohr. Albert Einstein arrived at Cal Tech for the first time in 1931 to polish up his 'Theory of General Relativity', and he returned subsequently as a visiting professor in 1932 and 1933. If nothing else, Einstein's visits dramatically showed that Cal Tech had come of age in the nineteen-thirties.

While I was a student at Cal Tech working on my PhD in nuclear physics in the early 1930's, I studied under many well-known scientists including Robert Millikan (Nobel Prize in 1923 for his study of the elementary electronic charge and the photoelectric effect); and J. Robert Oppenheimer, who, in the early days, taught us the theoretical implications of the results of our research projects. Robert was later known as the "father of the A-bomb." Other scientists in our midst were Ernest O. Lawrence who won the Nobel Prize "for the invention of the cyclotron and for results, especially with regard to artificial radioactive elements", Edwin Hubble, Merle Tuve, Charlie Lauritsen, and Albert Einstein who were all teaching at Cal Tech. That was quite a line-up.



Robert
Milliken



J. Robert
Oppenheimer



Ernest O.
Lawrence



Merle
Tuve



Charles
Lauritsen



Albert
Einstein



About Edwin Hubble: *For thousands of years, astronomers wrestled with basic questions about the size and age of the universe. Does the universe go on forever, or does it have an edge somewhere? Has it always existed, or did it come to being sometime in the past? In 1929, Edwin Hubble, an astronomer at Cal Tech, made a critical discovery that soon led to scientific answers for these questions: he discovered that the universe is expanding.*

Those of us who lived in the Faculty Club at the Athenaeum took our meals there in the dining room. At lunch-time one of the things everyone did was sit with other people and move around. One of the people I had lunch with as a graduate student on occasion was Edwin Hubble. Another would have been Albert Einstein, and most of the other visiting and resident professors.

At dinner time there was a group of us who regularly ate together at the round table. We were known as "The Athenaeum Round Table Gang."



Clockwise from near left: John Read, Norton Moore, Wolfgang Finkelburg, Henry DeVore, In the middle with the pipe was me, H. Richard Crane, William. A. Fowler, Lucas Alden, Walter Jordan.

The insulator for the ceremonial candle was "borrowed" from Royal Sorensen's High Voltage Lab. We sat at this round table together every night, and we always had the same waitress. This became quite a famous group of physicists.

During the time I was a PhD graduate student living in a room at the Faculty Club in the Athenaeum I met Florence LeBaron who was second in charge of the office. She and I became very special friends and later married. During that same time many of the noted visitors to Cal Tech also had rooms at the Athenaeum.

As the second in-charge at the Athenaeum, Florence was kept busy catering to the needs of the most famous resident at the Athenaeum, Albert Einstein, and his wife Elsa. Through that pipeline, Florence to me, I got anecdotes about the visitors – and about the things Florence was asked or required to do for them. It was all very interesting and sometimes quite amusing. But, that is another whole story.





Niels Bohr: Because of my knowledge of electronic equipment, I was expected to set up the PA system and run it when the noted visitors gave their talks in the auditorium. I remember the difficult time I had with a lecture by Niels Bohr, (*who won the Nobel Prize in 1922 "for his investigation of the structure of atoms and of the radiation emanating from them"*). It was a real challenge. To start with, it was well known that he speaks in whispers. I solved that easily with lots of amplifier gain. One thing I didn't expect was that every time he turned to write something on the board he turned clockwise. Then he turned back clockwise again, winding the microphone cord around himself. He was not aware of that. Every so often I had to unhook the microphone cord and unwind it from him. He never did catch on to why that was.

I was a good host in my room in the Athenaeum at cocktail time, thanks to a fellow named Wiley Brown. He had five unmarried daughters and a cellar full of vintage wines. He kept me supplied, and was most anxious to use that connection to get his daughters to meet Cal Tech men. He must have been disappointed with what he got out me, for all of his gifts of wine. He also had a place in the desert area, near a horse- rental place and other opportunities. I went there once for a day or two but the daughters were not there and I never did see or meet the daughters.

After I received my PhD in 1934, Florence and I were married. I had a one-year post-doctoral appointment, and we rented a small house next to the campus. In the fall of 1935 we shipped all our stuff to Ann Arbor where I had accepted the job as an Instructor. There was an interval between when our lease in Pasadena was up and when our house in Ann Arbor was available, so we spent the time driving, seeing and staying at a number of National Parks. It was the best vacation we ever had.



My friend and colleague, Bill Fowler. After receiving his bachelor's degree from Ohio State University in 1933, Willie Fowler came to Cal Tech to study with Charlie Lauritsen. Willie and I first met at Cal Tech and became a lifetime friends. Willie was one of those who dined at the "Round Table" in the Faculty Club every night. Willie shared the 1983 Nobel Prize in physics for his research into nucleo-synthesis, the process whereby the nuclei of lighter chemical elements fuse to create heavier ones, which means the creation of chemical elements inside stars. When I was on Sabbatical from Michigan in 1951, I went to Cal Tech to spend half a year, and at that time we lived next door to the Fowlers. We very much enjoyed the time we spent together, discussing physics and breaking bread at their house or ours.

I remember that when Willie first came to Cal Tech he was called Bill, by all who knew him. One time several of us were traveling to another university, or something, and happened to stop along the road for some lunch. While we were enjoying our lunch a woman, hollering at her small son said "Willie!!!!" Bill jumped and looked up quickly. At that moment we knew he had been called "Willie" by his parents, so we quickly took up on that, and forever more he was known as Willie!

"I can't imagine a better time to have been at Cal Tech!"

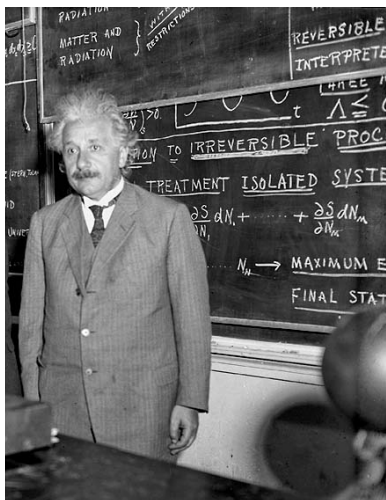
My Association with the Kellogg Foundation at Cal Tech

At Cal Tech my doctoral work was supported by a big project of the Kellogg Foundation, in which patients were treated with million volt X-rays. I had spent a lot of time helping with the construction and the operation of that, and had absorbed a lot of the lore. Here, during the time when the radiologists were bringing white rabbits and mice over for exposure to neutrons from the cyclotron (remember they were “part owners”) I held a regular seminar for them on the physics aspect of neutrons and radiation. My bible was a fat volume by Benjamin M. Duggar “The Biological Effects of Radiation”. It treated many questions at the molecular level, and described experiments that had been done. In my estimation it was an excellent book.

TURLOCK JOURNAL: Saturday March 20, 1934

During the time I was at Cal Tech there was a determined journalist at the Los Angeles Times who reported on everything we did. So our accomplishments, good bad or indifferent, were well documented. I still have a scrapbook that Florence kept of all those articles. I was mentioned and the subject in some of those articles. On Saturday March 20, 1934 there was an article about me in The Turlock Journal concerning some work Charlie Lauritsen and I were doing. I quote the article to indicate the type of work we were involved in back then.

“A New radioactive substance, believed to be a new form of nitrogen, containing properties similar to those of radium and produced entirely by artificial technique, has been evolved by scientists of the California Institute of Technology. In the experiment, Dr. Charles Lauritsen, in collaboration with Richard Crane and W.W. Harper, research physicists, succeeded in converting carbon, which is a non-radioactive element, into a new and highly radioactive form. It is believed that the new form will be highly valuable in medical science and that the methods used can be applied to the artificial production of many other new radioactive substances. In brief, the three scientists energized deuterons, which are heavy hydrogen particles by means of a 900,000 volt vacuum tube, and then allowed the deuteron “cannon balls” to bombard carbon. The result is radioactive material in a new form or isotope of nitrogen. Richard Crane is the son of Mr. and Mrs. Horace Crane, long-time pioneers of this city.”



That's Albert Einstein at his chalkboard



This is me at my chalkboard.