

BYU Chemistry Department History.....January 22, 1994.....H. Tracy Hall

Responsibilities and Titles:

Professor of Chemistry and Director of Research and Creative Endeavor for the entire university 1955-1967

Taught Quantum and Statistical Mechanics from 1955 until the arrival of Richard Snow in ?

Distinguished Professor of Chemistry.....1967-1981

Retired Distinguished Professor of Chemistry.....1981 to present

Director of High Pressure, High Temperature Interdisciplinary Laboratory

People from chemistry, physics, electrical engineering, mechanical engineering, geology, and occasionally other disciplines worked in this laboratory.....1955-1981.

The number of students receiving advanced degrees from research in this lab:

Chemistry: 6 Ph.D.

Chemical Engineering: 1 Ph.D.

Electrical Engineering: 1 Ph.D.

Mechanical Engineering: 1 M.S.

Geology: 1 Ph.D.

Physics: 14 M.S.

Physics: 20 Ph.D.

The Lab had a number of visiting professors who stayed here to do research from 6 to 12 months. An inordinate number of scientists visited the Lab to learn of our high pressure expertise. At this point in time, the art and science of high pressures at high temperatures spread to the world from Brigham Young University and we were highly regarded for it.

Approximately 200 publications resulted from research at the Lab. Dr. Hall was author or coauthor for many of them.

More than one million dollars were procured in the way of outside

research grants from 1955-1981.

Impressive honors, awards, and distinctions garnered by Dr. Hall for his research numbered 47.

Dr. Hall studied patent law for about one year on his own and passed the patent bar examination in June of 1980 to become a Patent Agent.

He holds 19 U. S. Patents and 59 corresponding foreign patents

Dr. Hall came to the BYU from the General Electric Research Laboratory located at "The Knolls" in Schenectady, New York. While there, he invented an apparatus capable of obtaining never before anticipated extremes of both temperature and pressure simultaneously combined. He called his apparatus the "Belt" (U.S. Patent No. 2,941,248). Using this apparatus, he became the first person in the world to transform graphite into diamond (U.S. Patent No. 2,947,608). He did this on December 16, 1954. This discovery quickly became a commercial success. Industrial diamond grit was in production by 1957. Billions of carats of diamond that are now measured in tons per year are now produced in gigantic machines that are exact, scaled-up replicas of Dr. Hall's original Belt device.

Dr. Henry Eyring, Dr. Harvey Fletcher, Sr., and Pres. Ernest Wilkinson, on learning of Dr. Hall's desire to leave General Electric for Academia and greater freedom, were instrumental in bringing him to BYU.

Dr. Hall anticipated that he, as the inventor of the Belt, had shop rights to use it for personal research at BYU. Government Secrecy orders and General Electric proprietary interests, however, prevented him from using it.

Trapped, he turned his attention to developing something entirely different from his Belt. He experimented with a number of ideas, duly recorded in his scientific notebook. Finally he narrowed his ideas down to a device that he named the "Tetrahedral Press". The original machine, at this writing, is still on display in the foyer of the Eyring Science Center. Two years after arriving at BYU, Dr. Hall had given his Tetrahedral Press its ultimate test. He made diamonds in it on December 27, 1957.

The patent on it was obtained through an agreement with Research Corporation and it issued as patent No. 3,159,876.

Later, he invented the Anvil Guide (U.S. Patent No. 3,182,353) and the Multi-Anvil Press (U.S. Patent No. 3,440,687). Cubic or Hexahedral Presses are encompassed by the Multi-Anvil patent. The incorporation of the Anvil Guide into Tetrahedral and Cubic Presses increased their ease of use and general utility immensely.

Dr. Hall realized that a good machine shop was vital to research in the physical sciences. Consequently, he took charge of the small machine shop operated by Fred Childs that was located in a Quonset Hut near the coal fired heating plant. Incidentally, a large metal building was erected in the same vicinity for our high pressure research. The high pressure building served our researchers well until it was taken over for Coal Research in 1983

Sometime after the end of World War II, surplus machine tools became available to Universities at bargain prices. Fred Childs was very adept at locating the machines that we needed. Consequently, our machine shop became the best shop in Utah valley. Interestingly, military "downsizing" has, at this writing opened the gates again to the obtaining of later version machine tools of excellent quality.

Chemistry courses taught by Dr. Hall in addition to the courses already mentioned:

Thermodynamics.....	occasionally
Physical Chemistry.....	occasionally
Honors Chemistry	occasionally
Freshman Chemistry.....	1967-1981
Pre-med & Dent. & Engineering.....	1967-1981

Picture of Dr. H.Tracy Hall Hall with one of his Tetrahedral Presses.

Many of Dr. Hall's chemistry classes were held in the Carl Eyring Science Center "Pits". Sometimes there were 200 student in a class. An interesting, repeatable "happening" would occur at the beginnning of every new class. As he introduced himself, gave a handout, and launched his introduction, excited females would, as if in a chorus, exclaim, "He talks just like Jimmy Stewart". "It's true", says Dr. Hall. "People have been telling me that since I left high school."

Dr. Hall gave weekly examinations and never let his students get behind in their work. He held extra, personal classes himself for those who were in trouble. Additionally, he gave a mid-term and a final examination. Then he allowed students to drop their worst weekly exam paper in determining his or her final grade.

Picture of Dr. H.Tracy Hall with one of his Tetrahedral Presses.



