

The University of Southern Mississippi  
Department of Polymer Science

May 2, 1985

Dr. H. Tracy Hall  
1711 N. Lambert Lane  
Provo, Utah 84604

Dear Tracy:

I am pleased to enclose a rough draft of your profile for the AIC book. Please correct, make any additions you wish and return the corrected copy to me for publication. Your personal and professional life are most impressive.

Sincerely, Raymond B. Seymour  
Distinguished Professor

**Howard Tracy Hall**  
**Raymond B. Seymour**  
**Department of Polymer Science**  
**University of Southern Mississippi**  
**Hattiesburg, MS 39406-0076**

The diamond, which is one of world's most important minerals, is simply a closely packed cubic arrangement of carbon atoms. This isometric octohedron crystal is harder than any other substance and is rated as 10 on the Ohms hardness scale.

In addition to their use as precious gems, uncut diamonds are used as industrial abrasives. Diamonds were mined in the Golconda region of India in the 18th century and later in Minas Gerais, Brazil. Since the discovery of a 21 carat diamond near Hopetown South Africa in 1807, many gems and industrial diamonds have been mined on the banks of the Orange River. Diamonds are also mined in Yakutia USSR.

In spite of their chemical simplicity, the synthesis of diamonds was not achieved until the late 1950<sup>s</sup> when American Institute of Chemists (AIC) Chemistry Pioneer (1970) patented the synthesis of industrial diamonds (U.S. Pat. 2,947,908, 2,947,610) (1960) using his patented high pressure/high temperature "belt" apparatus (U.S. Pat. 2,911,242 (1960)). This "belt" can maintain a pressure of a million psi at a temperature of 2,000°C. Over 200 tons of industrial diamonds have been made worldwide as a result of Dr. Hall's invention.

Since the "belt" patent was assigned to G.E. and could not be used by Dr. Hall after he left that company, he invented and patented a tetrahedral press (U.S. Pat. 2,947,608 and 10). He also was instrumental in starting Megadiamond Industries which

produce sintered diamonds using his patented process (U.S. Pat. 3,816,085, 3,829,544 and 3,913,280).

Since Dr. Hall served as a professor at Brigham Young University (1955-1980) it is not surprising to note that he also investigated the fundamentals of high pressure processes. These developments included: the first melting curve of germanium under high pressure and temperature, the first high pressure, high temperature X-ray diffractions' apparatus, induced phase change of ytterbium from close packed to a non-close packed structure, the determination of the "resistance cusp" in cesium and the synthesis of over 100 rare earth compounds and polymorphs.

Howard Tracy Hall was born in Ogden UT on October 20, 1919. He was the son of Howard and Florence Tracy Hall.

After graduating from Ogden High School, he enrolled in Weber College and then transferred to the University of Utah where he received a BS, MS and Ph.D. degrees in 1942, 1943 and 1948, respectively. He also spent 2 years as an Ensign, working in electronics, in the US Navy during World War II.

While in school, he worked as a photographer (1939-1940), as a part time analyst for Sperry Flour Mills (1940-1942) and for the US Bureau of Mines Research Laboratory at Salt Lake City. He was a research associate with GE at Schenectady NY (1948-1955) and then joined the faculty of Brigham Young University where he was made Professor of Chemistry and Chemical Engineering Emeritus in 1980. During his tenure at Brigham Young he received over \$1.3 million in grants from national funding agencies.

In addition to being a lifetime Fellow of AIC, Dr. Hall is a member of the American Chemical Society (ACS), the American Association for the Advancement of Science, the American Physical Society, Sigma Xi, Phi Kappa Phi, Utah Academy of Science, Arts and Letters and Timbanogos Club of Utah.

In addition to the AIC Chemistry Pioneer Award (1970) Dr. Hall received the following honors: the Karl G. Maeser Research Award from Brigham Young University (1978), the International Prize for New Materials from the American Physical Society (1977), the Willard Gardner Prize of the Utah Academy of Science, Arts and Letters (1977), the Distinguished Alumni Award from Weber State University (1975), the IR-100 Industrial Research Magazine Award for Invention of Indexible Sintered Diamond Cutting Tools (1974), Engineering Materials Achievement Award from the American Society for Metals (1973), the Outstanding Manhood Award from Brigham Young University (1971), the Utah Award of the Salt Lake City ACS Section (1965), the Modern Pioneers in Creative Industry Award from the National Association of Manufacturers (1965), the James E. Talmade Scientific Achievement Award from Brigham Young University (1965), the Research Medal from the American Society of Tool and

Manufacturing Engineers (1962), and the ACS Gold Medal Award for Creative Invention (1972).

Tracy married Ida-Rose Langford in 1941. The Halls are parents of 7 children: Sherlene (Bartholomew), Howard Tracy, Jr., David Richard, Elizabeth (Neil), Virginia (Wood), Charlotte (Weight), and Nancy (Mecham).

Dr. Hall was awarded an honorary doctoral degree by Brigham Young University (1971). He has held many leadership positions, including the office of Bishop (1976-1981) in the Church of Jesus Christ of the Latter Day Saints. He and Mrs. Hall spent 2 years (1981-1983) as missionaries in Zimbabwe and South Africa.

Professor Hall has published almost 100 articles in scientific journals and has been awarded 19 patents by the US Patent Office. He has also been awarded patents by patent offices in 17 foreign countries.

In 1980, he was admitted to practice patent law before the US Patent and Trademark Office. In addition to being a photographer, Tracy Hall is a draftsman, bookkeeper, typist, machinist, welder, electrician, mechanic and "old time" piano player. He was the leader of the "High Hatter's Dance Band" in Ogden UT (1937-1939). He also served as priesthood organist for the Ogden 18th Ward (1936-1938).

If AIC Pioneer Henry Hass were writing this profile, he might have said the following:

There once was a professor named Hall  
Who played piano at many a ball.  
The diamond he invented  
and never repented  
For his biography says it all.

H. Tracy Hall

Raymond B. Seymour  
The University of Southern Mississippi  
Department of Polymer Science  
Southern Station, Box 10076  
Hattiesburg, Mississippi 39406

Dear Ray

Thanks very much for your kind words about me. Your work is appreciated! I have penciled in some minor changes. A photo is enclosed.

Sincerely, Tracy                      23 May 1985