ALUMNI ASSOCIATION

June 8, 2010

Sherlene H. Bartholomew
1062 East 1010 North
Orem, UT 84097-4301

Dear Ms. Bartholomew,

In recently searching through our files in the Brigham Young University Alumni Records office, we discovered the enclosed information concerning your late father, H. Tracy Hall. In years past, the Alumni Records office collected newspaper clippings, biographical forms, and photographs of alumni who made significant contributions to the university and/or community. Because our office no longer continues this practice, I would like to send you the contents of Mr. Hall's file for your personal enjoyment. On behalf of the BYU Alumni Records office, I hope that you find these records meaningful and useful for your own family records.

Sincerely,

Jessica L. Mains

Jessica L. Mains
Asst. Records Manager, Alumni Records
Brigham Young University
342 HC
Provo, UT 84602

12 June 2010

Dear Descendants and close relatives of H. Tracy Hall, Sr.,

What a surprise yesterday when this large white envelope from BYU, addressed to me, came in the mail!

Their Asst. Records Manager advised me that in years past their office collected news clippings, bios, photos and other memorabilia, but have discontinued this practice. So she thought I would like to have the contents of their file on my "late father," as they close down their collection.

You might imagine the excitement with which I sifted through the contents. I've been thinking about Father's Day and what to give the fathers in my family--this felt like a gift from the past to me from my dear, sweet Dad!

I'm still digesting all this--it include some 20 original news clippings (some I've never seen), an original letter to Pres. Wilkinson, signed by Dad, articles about Dad, some bios., notes on him from some faculty member, a note in Dad's handwriting, photos and bios Dad's office sent them for various press releases, a "War Service Record" form filled out by Dad (his handwriting) distributed by T. Earl Pardoe's Committee, with purpose that BYU would have a memorial listing all service of its men and women who served their country in a war time assignment (Dad's eye for detail makes this important genealogical material--for example, he noted his exact dates for entry and discharge from the US Navy Reserve as "April 21 1944 - April 20, 1946" and that his last rank was "Ensign").

One of the clippings I had never seen, from the "Daily Herald," shows a large photo of David and Dad, with a pile of 25,000 carats of industrial diamonds "worth $25,000-$50,000" on the table in front of them (dated 16 Dec 1979, article titled: "Invented by BYU's Tracy Hall - Provo Firm Notes 25th Year of First Synthetic Diamond." David, if you have a glossy of that photo, I'd like a scan of it that will be better than I can get off this news clipping (if he sends it, I'll forward to the rest of you). Fun stuff!

Best of all was finding a photo of Dad (about age 65?) in formal attire and a black bowtie, probably taken by an attendee at some reception (never seen this one and like it as well as any "professional-look,"full-body photo I've seen of him, though it's a little dark--I'll see if we can "fix" that).

A fun surprise was finding the original submission of Dan's nomination of Dad for the Honorary Alumni Award they gave him. It was totally Dan's idea. A blessing I have had in my marriage is that Dan has loved my parents and siblings. Even if I got upset at someone in my family, he wouldn't hear it, so that has left me up a tree on more than one occasion.

Anyway, as Fathers Day approaches, it seems appropriate to share with you other descendants and spouses what he wrote (I remember at the time trying to discourage Dan, "Oh, they wouldn't pay attention to a nomination from a member of the family, and I think my parents would be embarrassed at your doing this"). Now I'm glad he ignored me. He wrote:

"This is the man who invented the synthetic diamond. He continued his work on creation of materials under high pressure and developed more than 100 new materials never before synthesized. He and his work are clearly world-famous. He has awards from professional societies. Holds 17 U.S. and 70

foreign patents for his work. He retired from full-time teaching at BYU in 1980. At age 61 he bought $1,500 worth of law books, passed the patent law section of the bar exam, and became a patent agent.

"As the director of research at BYU, he established the university as the leading center for high-pressure research in the world. He brought in over a million dollars in funding (this was 1957 and the 60s, when a million was worth something). He donated the royalties from many patents to BYU.

"I have lived in the same ward with one of his daughters [how's that for subtle--shb]--he was a wonderful father, devoted to his family. He was always active in the church. He is in his late 70s, so we shouldn't delay giving him an award."

This award came at a time when Dad's Alzheimers had come upon him and he was feeling somewhat forgotten and neglected. He was so excited, telling me about getting this award, I decided not to tell him Dan had nominated him and that one of my dear friends from Westchester Ward told me she chaired the alumni committee that made the selection (much later when we met up at a genealogy conference). These were obviously minor factors--Dad totally deserved this award). I'm now pleased that Dan was an impetus and chuckle that the committee knew darn well how Dan Bartholomew ended up in the same ward with one f Dad's daughters.

They really rolled out the red carpet for Dad. It was fun for Dan and me to come and see him and Mom off, as he with kid-like excitement was even in a parade, as part of honors extended that day.

It is with a bit of sadness that I see them close down Dad's file with them. I plan to make acid-free copies of all the clippings and other materials that I will donate, along with the originals, to BYU Library collection of Dad's papers. As my Fathers Day gift to Dad this year, I will also make a copy (also of the color photo) for all of Dad's descendants--if I can figure out how many) to distribute at our Hall reunion at David's this July. If any of you want to see this file, come to the reunion and get it!

Love, Sherlene

P.S. When we sibs were taking turns, choosing items at close of our parents' estate, I chose Dad's wisdom teeth that are in a container he hand-labeled as such. I figured they might be important some day for DNA study (Tracy tells me bone is the best kind of DNA sampling). Anyway, I'm thinking to also donate Dad's wisdom teeth to BYU's collection of his papers. What do you think? Should we keep them in the family? I could also give just one to BYU and keep the other tooth, myself--maybe his scientific and other wisdom will rub off on me, with close association. Then again, I could put them under my pillow for the tooth fairy--'bet I could get more for them than that dime the tooth fairy used to bring!

3409 028927

WAR SERVICE RECORD

We have been requested to have a complete record of all BYU students, graduates, and faculty members who have been in government service on a war basis. This includes World War I, World War II, and the Korean engagement up to truce time.

Kindly fill in the record as listed below -- this augments the Faculty Bulletin request of Monday last.

NAME: H(oward) Tracy Hall

Birth date Oct 20, 1919 Place Ogden, Utah

Parents: Father Howard Hall Mother Florence Tracy Hall

Their home address 638 - 28th St. Ogden.

Family, brothers and sisters 5 bro.

Marriage (name in full) Ida Rose Langford Hall

Children 6

Present residence 1711 N Lambert Lane Provo.

Education - schools and degrees BS, MS, PhD U. of Utah
List any honors and special activities

Languages spoken or read read german - French

Special church experience, such as missions, etc.

Civic honors or activities

Government record - branch of service (e.g. US Navy R) U S Navy Reserve

Last rank Ensign

Dates of entry and discharge April 21 1944 – April 20 - 1946

Honors and citations, medals, etc.

Any outstanding experience or event .

Purpose of this report: The BYU is to have a Memorial which will list all service men and women who have served their country in any war time assignment. A place of honor worthy of your attention and cooperation and not to be taken lightly. May we have your early response?

Kindly return to Dr. T. Earl Pardoe for the War Service Committee.

Chemical Society Gives Honor to Dr. Tracy Hall

award 11-18-1965

Dr. H. Tracy Hall, director of research at Brigham Young University, has been chosen to receive the distinguished service award of the Salt Lake Section, American Chemical Society.

Dr. Evan Allred of Univer- of Utah Chemistry Department, information director for the Salt Lake Section, said Dr. Hall will receive the citation at the annual award dinner Thursday, Dec. 9, at 6:30 p. m. in the U. of U. Union Building.

Dr. Hall

Dr. Hall, the first person to make synthetic diamonds in the laboratory, will lecture to the group in Orson Spencer Hall at 8:15 p. m. following the dinner meeting.

Outstanding Contribution

Dr. Allred said Dr. Hall was chosen as the person having made the most outstanding contribution to chemical research while living in the state of Utah.

The Utah section has 400 members active in heavy industry, food manufacture, defense establishments, commerce and universities and colleges. There are 100,000 members nationally.

Recipients in the last years have been Dr. Emil Smith, formerly of U. of U. Medical School, now of UCLA; Dr. Lloyd Malm, U of U. Chemistry Department, Dr. Melvin A. Cook, Institute for Explosives Research; Dr. John R. Lewis, U. of U. Department of Mineral Industries; Joseph K. Nicholes, BYU, and Sherwin Maeser, Utah State University.

Last year Dr. Hall was retained by the French government to install in Paris laboratories a research machine developed at BYU. The machine, named the Tetrahedral X-ray Diffraction Press, uses a beam of X-rays to prove matter while it is subjected to very high pressures and temperatures.

Dr. Hall came to BYU in 1955 as professor of chemistry and director of research. He left a position as research associate in General Electric Co., Schenectady, N. Y., where he had succeeded in making diamonds.

At BYU he has continued high - temperature, high - pressure experiments with development of even more efficient machines. His research has led far beyond the synthesis of diamonds into discoveries in materials science, geology, solid - state physics, chemical synthesis and engineering. The work has gained worldwide interest.

Producing pressures of 3,000,000 pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, thus creating materials which are unknown in nature.

National Award Goes To Dr. Tracy Hall

Dr. H. Tracy Hall, professor of chemistry at Brigham Young University, has been chosen to receive the Chemical Pioneer Award of the American Institute of Chemists next May.

According to word received at BYU today from the Institute's headquarters in New York, the award is given annually in conjunction with the annual meeting, to be held next year in Pittsburgh.

The award is presented to "chemical pioneers who have shaped the industry."

Dr. Hall, director of research at Brigham Young University, is the first man ever to produce artificial diamonds in the laboratory.

Here Since 1955

He came to BYU in 1955 as professor of chemistry and director of research, leaving a position as research associate in General Electric Co., Schenectady, N.Y. where he had succeeded in making diamonds.

At BYU he has continued high-temperature, high-pressure experiments with the development of more efficient machines on an altogether different principle from that he used at General Electric Company.

New Machine

The latest machine developed by Dr. Hall is the Tetrahedral X-ray Defraction Press, which uses a beam of X-rays to probe matter while it is subjected to very high temperatures and pressures. Producing pressures of 3,000,000 pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, repacking the atoms to create materials which are unknown in nature.

His research has led far beyond the synthesis of diamonds into discoveries in materials science, geology, solid-state physics, chemical synthesis and engineering. The work has gained world wide interest, and in 1964 he went to Paris to install a machine for the French government.

D. H. 11-21-69

BYU Scientists Force Atomic Rearrangement

2-4-1963

Three BYU scientists by the use of tremendous pressures have forced atoms in a metal to rearrange themselves in a phenomenon never before witnessed. The research was conducted by Dr. Tracy Hall, BYU director of research and the first producer of synthetic diamonds; Dr. J. Dean Barnett, assistant professor of physics; and Leo Merrill, graduate student.

IN THE EXPERIMENT the ts utilized the tetrahedral ress invented by Dr. Hall the sample of ytterbium under 40,000 atmospheres pounds) of pressure. ously, Dr. Hall explained, thought that atoms were cked like oranges in a nd they could not be put ser together. The tre- s pressure of Dr. Hall's however, induced a mation in the metal from a close-packed structure to a non-close-packed arrangement of atoms. During the experiment the atoms' volume decreased 11 percent, made possible by the fact that some of the electrons became free in the crystal.

The scientists were able to chart the transition of the atoms by means of an Xray diffraction apparatus attached to the tetrahedral anvil. This unique refinement was developed by Dr. Barnett.

The experiment was featured in this month's issue of Science magazine.

THE COVER OF the magazine carried a two-color illustration of a cube showing the arrangement of the atoms of ytterbium before the experiment and a second cube showing how the atoms had been rearranged.

Before the pressure was applied, the cube looked like a die used for gambling, except that it had only one dot—which represented an atom—on each face.

HIS WAS CALLED a body- the experiment caused the ns of ytterbium to change n close-packed face-centered ic structure to non-close-packed body-centered cubics.

s arrangement was described the article as a face-centered e. When pressure was applied atoms were rearranged as wn in the second illustration cube with one lone dot—atom p in the center.

Dr. Hall, Dr. Barnett and the graduate students assisting them are continuing the unique pressure-X-ray experiments.

DR. H. T. HALL RECEIVES SLOAN AWARD

C I N 2-19-59

Dr. H. Tracy Hall, director of the BYU research division, has received notice from the Alfred P. Sloan Foundation that he is to be awarded $12,000 for research and be honored as a Sloan Foundation Fellow.

The Sloan Foundation honors scientists between 30 and 40 years of age who have made outstanding contributions in their field. It is a world-wide organization.

Laboratory Diamonds

Dr. Hall was honored for his work in high pressure-high temperature research. He came to BYU from the General Electric Research Laboratory in Schenectady, N.Y., in 1955, where he laid claim to producing the world's first laboratory made diamonds. These diamonds are visible to the naked eye and are the first to pass all necessary tests of scientific scrutiny.

The synthesis was accomplished in apparatus he designed which sustained pressures in excess of 100,000 atmospheres simultaneously with temperatures above 3000 degrees centig

BYU Research

Since coming to BYU, I has continued his research high pressure-high temp field and last fall rec National Science Fou grant of $85,000 for the

The purpose of the res to better understand the of the high temperatu high pressures on all f matter. "We are able er to higher temperatur

Research Award

Boat Harbor Planned

A "resurvey" for establishing a boat harbor on Great Salt Lake has been requested by Sen. Wallace F. Bennett of Utah.

The Army engineers would do the work, provided the Senate Public Works Committee gives the go-ahead. Bennett wrote the Chairman, Dennis Chavez (D.-N.M.) urging the committee to act favorably.

pressures than anywhere else in the world," Dr. Hall stated.

Researchers at BYU have created pressures over 3,000,000 pounds per square inch simultaneously with temperatures of 10,000 degrees centigrade. Under varying pressures and temperatures melting points increase and decrease, electrical resistances change and many times the chemical bonding of the atoms within the element are changed.

Dr. Hall Takes Research Post at BYU

9-17-55 Ogden

Dr. H. Tracy Hall, son of Mr. and Mrs. Howard Hall, 639 28th St., has been appointed director of research at Brigham Young University.

Prior to his appointment, Dr. Hall was research associate at the General Electric Research Laboratory, Schenectady, N. Y., where he played a major role in producing the world's first man-made diamonds.

The synthesis of the diamonds was accomplished in an apparatus designed by Dr. Hall which permitted sustained pressures in excess of 1,500,000 pounds per square inch at temperatures above 5,000 degrees Fahrenheit. The diamonds are visible to the naked eye and meet all tests of scientific scrutiny.

While at BYU, Dr. Hall will encourage research in all fields and continue his research in the making of diamonds.

A native of Ogden, Dr. Hall received his bachelor's, master's and doctor of philosophy degrees at the University of Utah. He served two years in the Navy and was employed in the Bureau of Mines.

He is married to the former Ida Rose Langford, also of Ogden.

BYU Research Director Obtains $12,000 Grant

Be

DR. H. TRACY HALL
. . . $12,000 for research

PROVO—Dr. H. Tracy Hall, director of Brigham Young University's Research Division, Thursday was awarded $12,000 for research and honored as a Sloan Foundation Fellow.

The Sloan Foundation, a world-wide organization, honors scientists between 30 and 40 years of age who have made outstanding contributions in their field.

Dr. Hall was cited for his work in high pressure-high temperature research.

He came to BYU from the General Electric Research Laboratory in 1955, where he produced the world's first laboratory-made diamonds. These diamonds are visible to the naked eye and are the first to pass all necessary tests of scientific scrutiny.

Since coming to BYU, Dr. Hall has continued his research in the high pressure-high temperature field and last fall received a National Science Founadtion grant of $85,000 for his studies.

Purpose of the research is to better understand the effects of high temperature and high pressures on all forms of matter.

Dr. Hall said "We are able to generate higher temperatures and pressures than anywhere else in the world."

Researchers at BYU have created pressures over 3 million pounds per square inch simultaneously with temperatures of 10,000 degrees centigrade.

X Dr. H. Tracy Hall, Distinguished Professor of Chemistry, came to BYU in 1955. A pioneer in the field of high pressure/temperature research, he was the first person to synthesize diamonds. He has written approximately 50 scientific papers and holds about 50 patents. He has received awards from numerous organizations, including the American Physics Society, American Chemistry Society, American Institute of Chemists, and the American Institute for Metals.

Funds from his award will be used to further Dr. Hall's high pressure research.

APR 20 1965

BRIGHAM YOUNG UNIVERSITY
PROVO, UTAH

EARL C. CROCKETT, ACTING PRESIDENT

RESEARCH DIVISION

April 20, 1965

President Ernest L. Wilkinson
Brigham Young University
Provo, Utah

Dear President Wilkinson:

Thank you very much for your letter of April 15, 1965, in which you indicated that I will be honored as the recipient of the James E. Talmage Scientific Achievement Award at the Baccalaureate Exercises, Thursday, May 27, 1965. I am very grateful to you, other University officials and faculty, and to the Board of Trustees for this honor.

Ben E. Lewis is my Stake President and a man whom I admire very much. I would appreciate having him introduce me if he were willing.

Thank you again for this honor.

Sincerely,

Tracy

H. Tracy Hall

Graduation . . .

DAILY UNIVERSE

SPECIAL GRADUATION ISSUE

Vol. 17 No. 152 Thursday, May 27, 1965 Provo, Utah

Hansen Watkins Silver Hall Butt Zundell

Outstanding Service, Exemplary Life Mean Special Awards For Six People

Six special awards for outstanding service and exemplary living will be presented by BYU as a part of the annual Baccalaureate exercises, scheduled for May 27 in the Smith Fieldhouse.

Dr. George H. Hansen will receive the Karl G. Maeser Distinguished Teaching Award.

FORMER U.S. SENATOR Arthur V. Watkins will receive the Abraham O. Smoot Public Service Award.

Denver business leader Harold Silver will be honored with the Jesse Knight Industrial Citizenship Award.

The James E. Talmage Scientific Achievement Award will be presented to the BYU director of research, Dr. H. Tracy Hall.

NEWBERN I. BUTT, assistant professor emeritus of library and research, will receive the BYU Special Award in recognition of his long service to the library.

Mrs. Sarah E. Zundel, Salt Lake City, will be honored with the Joseph F. Smith Family Living Award.

Dr. Hansen currently is a profession of geology and geography and has served in the past as an acting dean of the Graduate School and as dean of the former College of Arts and Sciences.

HE WAS INSTRUMENTAL in setting up facilities for the teaching of geology at the National University of the Republic of Indonesia.

Dr. Hansen received his B.S. degree from Utah State University in 1918 and his M.S. and Ph.D. degrees from George Washington University in 1925 and 1927.

Arthur Watkins is currently serving as a member of the United States Indian Claims Commission. He served in the United States Senate from Utah from 1946 to 1958.

MR. WATKINS PRACTICED law in Utah County and served as a judge in the Fourth Judicial District before his election to the Senate.

Harold Silver is president of the Silver Engineering Works and the Silver Steel Company and is well known in business circles as an inventor and engineer.

He has served as chairman and president of the Denver Community Chest, president of the Denver Area Council of the Boy Scouts of America and as a trustee of the University of Denver. Mr. Silver was named outstanding businessman of Colorado in 1951.

DR. HALL WAS THE first man to produce synthetic diamonds and has become world recognized as an expert on high-temperature, high-pressure experiments.

He delivered the first Annual Faculty Lecture at Brigham Young University in 1964 and the third annual Olin Lecture to the faculty of Yale University.

Mr. Butt, from his desk in the University Archives, has been collecting materials on the history of Utah and Brigham Young University since 1922.

HE HAS INDEXED hundreds of diaries, books and minutes of meetings of BYU's Board of Trustees in his work. In 1956 he was honored by the Mountain Plains Library Association for his collection on local history.

Mrs. Zundel is the mother of six bishops of The Church of Jesus Christ of Latter-day Saints. Of her ten children, three other sons have served as missionaries of the Church.

Now 87 years old, Mrs. Zundel is an active worker in the Salt Lake Temple of the Church. She was widowed more than 40 years ago and had the responsibility of a large family for many years.

PROVO HERALD

APR 4 - 1972

Dr. Tracy Hall to Get Chemical Society Award

DR. H. TRACY HALL

Dr. H. Tracy Hall, distinguished professor at Brigham Young University, will receive the American Chemical Society's Award for Creative Invention at the 163rd national meeting of the organization in the Sheraton-Boston Hotel Monday. He will also deliver a major address.

The award, given to the inventors for work contributing "to the material prosperity and happiness of people," recognizes Dr. Hall's outstanding achievements in developing the high-pressure, high-termperature apparatus needed to synthesize diamonds. The major industrial uses of synthetic diamonds are for grinding grits, diamond saws, and oil well drilling bits.

Synthesizes Diamonds

Dr. Hall was a chemist with the U.S. Bureau of Mines in Salt Lake City for three years before he joined the General Electric Research Laboratory in Schenectady, N.Y., where he first synthesized diamonds in 1954. He was named director of research and professor of chemistry at Brigham Young in 1955 and was appointed to his present position in 1967. Dr. Hall is also president of Megadiamond Corporation, Provo, Utah.

Winner of the 1970 Chemical Pioneer Award of the American Institute of Chemists, Dr. Hall also has received the Modern Pioneers in Creative Industry Award from the National Association of Manufacturers, the Utah Award from the ACS Central Utah and Salt Lake Sections, the James E. Talmage Scientific Achievement Award and the honorary doctor of science degree from Brigham Young University.

He is the author or co-author of more than 70 scientific articles and some 15 patents. A member of the American Chemical Society since 1947, he served as 1959 chairman and 1963 councilor of the ACS Salt Lake Section. He is also a member of the American Association for the Advancement of Science, the American Phylical Society, Sigma Xi, and the Utah Academy of Sciences, Arts and Letters.

HOWARD TRACY HALL

JAMES E. TALMAGE SCIENTIFIC ACHIEVEMENT AWARD

5-28-1965

We honor tonight Howard Tracy Hall, who on December 16, 1954, became the first man to make diamonds. His subsequent scientific research in the field of high pressures and temperatures has led to important developments in material science, geology, solid-state physics, chemical synthesis, and engineering.

Dr. Hall obtained the B.S., M.S., and Ph.D. degrees in physical chemistry from the University of Utah. From 1942 to 1944 and in 1946 he worked as a chemist at the U.S. Bureau of Mines. He served two years as an officer in the U.S. Navy, and from 1948 to 1955 served as a research associate at the General Electric Research Laboratory.

In 1955 Dr. Hall came to Brigham Young University as professor of chemistry and director of research. In 1964 he delivered the First Annual Faculty Lecture at the University. He is a past president of the Utah Academy of Sciences, Arts, and Letters; pas chairman of the Salt Lake Section of the American Chemical Society; a fellow in the American Association for the Advancement of Science; a member of Phi Kappa Phi, Sigma Xi, and the American Chemical Society.

Other recognitions include being selected by the Alfred P. Sloan Foundation as a Research Fellow, and receiving the research medal in 1962 awarded by the American Society of Tool and Manufacturing Engineers. He served as a member of the Editorial Board for Inorganic Chemistry from 1961-1964.

His research includes work in quantitative analytical spectroscopy, chemistry of chromic salts, application of reaction rate theory, and physical chemistry of high polymers. He holds a number of patents and his studies have been published widely.

A major support and inspiration to Dr. Hall is his wife, Ida Rose. Together they have produced diamonds in the form of seven fine children. Dr. Hall has given unstintingly of his time in Church service.

We salute Dr. Hall as an outstanding scientist, teacher, father, and believer in Christ, and we take pleasure in acknowledging him as this year's recipient of the James E. Talmage Scientific Achievement Award.

NOMINATIONS FOR 1965

JAMES E. TALMAGE SCIENTIFIC ACHIEVEMENT AWARD

(To be granted to the scientist who has made significant advances in the field of physical, biological, medical, engineering, agricultural, and social sciences, either basic or applied.)

Name	Present Position
1. H. Tracy Hall	Director of Research, Brigham Youn University

No. other candidates for 1965:

9 years at B. Y. U.

Recipient of First Annual Faculty Lecture Award at B. Y. U.
(See attached program)

The Daily

PROVO, UTAH COUNTY, UTAH THURSDAY,

12-2-1965

Dr. H. Tracy Hall

Synthetic Diamond Scientist Honored

Dr. H. Tracy Hall, director of esearch at Brigham Young Jniversity, today received the 'Modern Pioneers in Creative ndustry" award of the Nation- al Association of Manufactur- ers.

Dr. Hall, who was the first man ever to produce synthetic diamonds in the laboratory, re- ceived the honor at the NAM's Annual Congress of American ndustry at Waldorf-Astoria Ho- el. Several on the team who worked with him at General Electric Company laboratories also were honored.

Top Thinkers

The awards are given to men and women who have been ino- ators in thinking which has ar-reaching effect on science, nowledge and society. Other nen of science who have re- eived the award for their trides into the unknown are Orville Wright, pioneer in avia- on; Lee deForest, inventor of ne radio vacuum tube; and Charles Kettering, developer of Diesel and high compression ngines, ethel gasoline and elec- rical equipment.

Dr. Hall will return o Utah to receive the distin- guished service award of the Salt Lake Section, American Chemical Society, Thursday, Dec. 9, at 6:30 p.m. at Univer- ity of Utah Union Building. He will lecture to the Utah hemists in Orson Spencer Hall at 8:15 p.m. following the dinner meeting.

Worked In France

Last year Dr. Hall was re- tained by the French govern- ment to install in Paris labora- tories a research machine de- veloped at BYU. The machine, named the Tetrahedral X-ray Diffraction Press, uses a beam of X-rays to prove matter while it is subjected to very high pressures and temperatures.

Dr. Hall came to BYU in 1955 as professor of chemistry and director of research. He left a position as research as- sociate in General Electric Co., Schenectady, N.Y., where he had succeeded in making dia- monds.

Experiments At BYU

At BYU he has continued high-temperature, high-pressure experiments with development of even more efficient ma- chines. His research has led far beyond the synthesis of diamonds into discoveries in materials science, geology, solid-state physics, chemical synthesis and engineering. The work has gained worldwide interest.

Producing pressures of 3,000,- 000 pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall and his associates have approached the conditions in- side the earth and stars, thus creating materials which are unknown in nature.

Y. Prof Seeks Business Site

1-7-1966

PROVO (AP) — A plan to turn pressure research into a business was unveiled to the city commission by a Brigham Young University scientist who sought property for the venture.

Dr. H. Tracy Hall, requested the commission to consider the lease or trade of property near the city's North Well in the north part of the city. He said the land would be used by a newly - formed company, Mega - Pressure Products and Research Co., which plans to convert the fruits of high pres- sure research into development of commercial products in the drug, semi-conductors and abrasives lines.

SYNTHETIC GEMS

Dr. Hall is one of the men instrumental in developing the first equipment which produced synthetic diamonds through high pressure techniques.

He said the comapny has some rights to property near the Lions Park which may have some zoning difficulties, and he suggested a trade of this prop- erty for city land or lease of city land.

Mayor Verl G. Dixon said the city would look into the possibil- ities of various city properties in the area and would meet with the men to discuss the request further.

PROTEST LOT

In other business Monday a group of northwest citizens pro- tested the possible way of a newly paved area at the top of a hill over looking the Geneva Recreation Association Park as a parking lot. They said traffic and safety problems would be created.

The commission asked the city attorney to check with the association as to its intended use of the property and into other aspects of the problem.

Owned By 3 BYU Scientists

Pressure Products, Research Firm Begins Construction of Building

1-31-1966

Mega Pressure Products and Research Corp., organized by three scientists on the faculty of Brigham Young University, has begun construction of a new building at 275 W. 2320 N. in Provo.

Dr. H. Tracy Hall, director of research at BYU and presi- dent of Mega, said the building will be completed about Nov. 1. It will be a center for re- search and development deal- ing with high pressures and temperatures with production expected to begin in about a year and a half.

Involved in production will be such materials as diamond-like substances, semi - conductors and pharmaceutical items.

Associated with Dr. Hall in the project are Dr. Bill Pope and Dr. Duane Horton, both of the chemical engineering de- partment at BYU, who are vice presidents in the new corpora- tion.

W. A. Harmon Construction Corp. of Provo is constructing the building.

Dr. Hall indicated that the firm plans to use very high pressures and temperatures to cause chemical reactions and to take ordinary materials and transform them into more val- uable substances that might have such uses as abrasives or electronic materials.

With General Electric before joining the BYU faculty 11 years ago he accomplished sim- ilar work and made the first man-made diamond.

Pioneer research and develop- ment in the field accomplished at BYU formed the basis for articles by Dr. Hall published in scientific journals. Since then, approximately 150 labs in the country have undertaken work in the area. Last year about 600 articles were pub- lished whereas 10 years ago there were none, indicating the growing awareness in the high pressures and temperatures field.

SEP - 7 1967

BRIGHAM YOUNG UNIVERSITY

News Bureau

Dr. H. Tracy Hall
"Distinguished Professor"

Dr. H. Tracy Hall, the first man ever to produce artificial diamonds in the laboratory, has been appointed "distinguished professor" at Brigham Young University, it was announced today by President Ernest L. Wilkinson.

Only one other person, Dr. Virginia Cutler, dean of the College of Family Living at BYU, has been accorded this honor, President Wilkinson said. The title is an extra rank above the regular academic classificitions on University campuses reserved for faculty members who have achieved special distinction. In addition to the presitige, it allows the distinguished professor more time for creative work and teaching special classes, such as advanced seminars.

The traditional rankings on college and university campuses are instructor, assistant professor, associate professor, and professor, according to the faculty member's training and length of service. The titles of department chairman and college dean are special administrative assignments.

Dr. Hall, who came to BYU as professor of chemistry in 1955, served as director of research for 12 years. He formerly was research associate in General Electric Company, Schenectady, New York, where he had succeeded in making diamonds.

At BYU he has continued high-temperature, high-pressure experiments with the development of more efficiant machines and his work has become world famous. Several learned sociaties have honored him with medals and citations. In 1964 he went to Paris to install a machine for the French government.

The lastest machine developed by Dr. Hall is the Tetrahedral X-ray Diffraction Press, which uses a beam of X-rays to probe matter while it is

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subjected to very high temperatures and pressures. Producing pressures of 3,000,000 pounds simultaneously with pressures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, repacking the atoms to create materials which are unknown to nature.

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May 14, 1962

Hall home from trip to Europe

Dr. H. Tracy Hall, director of research, returned Thursday from a two-week lecture and study tour in Western Europe.

The BYU chemistry professor, who was the first man to produce synthetic diamonds, spoke at an international chemical meeting in Paris. Thousands of scientists and chemical company executives attended this meeting, which in one session heard Dr. Hall's report on high pressure and high temperature research being conducted at BYU.

DR. HALL also spoke at the National Physical Laboratory in London and at the Bellevue Laboratory near Paris. He visited the diamond tool industry in Brussels and Antwerp and the high pressure lab in Stockholm's General Electric Co. of Sweden, Ltd.

"All over Europe, where high temperature-high pressure research is being conducted, they are using equipment which was developed at BYU," Dr. Hall reported.

THE WORLD-famous scientist came to BYU in 1955 after working with a team of four scientists at the G.E. research laboratory in New York in developing synthetic diamonds. The machines at both G.E. and BYU were designed by the BYU professor.

Dr. Hall received the Ph.D. degree in chemistry in 1948 at the University of Utah. In 1944 he worked as a chemist for the U. S. Bureau of Mines. From 1944-46 he was an ensign in the U. S. Navy.

FRIDAY, SEPT. 8, 1967 Utah County, Utah Daily Herald 5

'Distinguished Professor'

BYU Scientist Gains Special Faculty Rank

Dr. H. Tracy Hall, the first man ever to produce artificial diamonds in the laboratory, has been appointed "distinguished professor" at Brigham Young University, it was announced today by President Ernest L. Wilkinson.

Dr. Hall

Only one other person, Dr. Virginia Cutler, dean of the college of Family Living at BYU, has been accorded this honor, President Wilkinson said. The title is an extra rank above the regular academic classifications on university campuses reserved for faculty members who have achieved special distinction. In addition to the prestige, it allows the distinguished professor more time for creative work and teaching special classes, such as advanced seminars.

The traditional rankings on college and university campuses are instructor, assistant professor, associate professor, and professor, according to the faculty member's training and length of service. The titles of department chairman and college dean are special administrative assignments.

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The lastest machine developed by Dr. Hall is the Tetrahedral X-ray Diffraction Press, which uses a beam of X-rays to probe matter while it is subjected to very high temperatures and pressures. Producing pressures of 3,000,000 pounds simultaneously with pressures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, repacking the atoms to create materials which are unknown to nature.

FEB 15 1967

BRIGHAM YOUNG UNIVERSITY

News Bureau

Establishment of a High Pressure Data Center at Brigham Young University for the National Bureau of Standards was announced today by BYU President Ernest L. Wilkinson.

Director of the center is Dr. H. Tracy Hall, first man ever to produce synthetic diamonds in the laboratory. The center was established at BYU because of the University's leadership in the field of high pressure, high temperature research.

Data on high pressure research from all over the world will be assembled and evaluated at the BYU office for the Bureau of Standards. It will maintain complete bibliographic files relating to all papers ever published on the subject. The collection is key punched and placed on magnetic computer tape for rapid retrieval of information.

Another major problem facing the center is the establishing of an accurate determination of the high pressure scale which would be accepted by all researchers, according to Leo Merrill, Dr. Hall's colleague in the project.

A great deal of correspondence is carried on with all of the major high pressure laboratories throughout the world to keep up to date with current research. Many requests are received for information from the file which is the most complete of its kind in the world. The center also provides for translation of papers written in foreign languages.

An additional study will be the evaluation of temperatures in high pressure environment. The center hopes also to be able to supply scientists with information they need on melting points, solid phase transitions, magnetic properties, optical properties, x-ray structures of materials, and thermodynamic data and properties of materials at high pressure.

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The research pioneered by Dr. Hall at BYU now has spread to hundreds of laboratories all over the world. Dr. Hall has traveled to Europe several times to advise foreign nations.

The latest machine developed by Dr. Hall at BYU is the Tetrahedral X-ray Diffraction Press, which uses a beam of X-rays to probe matter while it is subjected to very high temperatures and pressure.

Producing pressures of 3,000,000 pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, repacking the atoms to create materials which are unknown in nature.

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Less than one year after he earned international recognition for developing the first synthetic diamond, Howard Tracy Hall came to B.Y.U. as Director of Research. It was in the laboratories of General Electric that Dr. Hall, working with ultra-high pressures and temperatures greater than 3000 degrees centigrade—conditions likely comparable to depths of 400 miles within the earth—achieved the first synthesis of diamonds by a means that other scientists could duplicate. This discovery freed the United States from the domination of the natural diamond producers, making available another source of this mineral whose hardness makes it essential in industry. But the synthetic diamond is only a product of broader interest and achievement. While most eyes are focused on the possibilities of space, Dr. Hall has concentrated on what exists within the earth. He has been primarily concerned with developing equipment capable of sustaining over long periods of time high pressures and temperatures comparable to those in the earth. He has developed concepts valuable not only to the geologist but to the chemist, the physicist, and the metallurgist. A native of Ogden, Dr. Hall received his Ph.D. at the University of Utah and did further graduate research at Bowdoin College and Massachusetts Institute of Technology. He is the author of a great number of scientific articles and a member of several scientific societies.

H. TRACY HALL

BIOGRAPHICAL SKETCH

August 1967

Hall, Howard Tracy

Current Address:

1711 No. Lambert Lane, Provo, Utah 84601; Home Phone (801) 373-3323; Office, T-41, Brigham Young University, Provo, Utah 84601; Phone (801) 374-1211, Ext. 3477.

S.S.#529079801

Born:

Ogden, Utah, 20 Oct. 1919 (Parents: Howard and Florence Tracy Hall).

Married:

To Ida Rose Langford, 24 September 1941 in Salt Lake City, Utah.

Children:

Sherlene, Howard Tracy, Jr., David Richard, Elizabeth, Virginia, Charlotte, Nancy.

Education:

B. S. 1942 M. S. 1943, Ph. D. 1948 (Physical Chemistry) University of Utah, Special wartime training, 11 months in electronics at Bowden College, M. I. T., Harvard and Honolulu Naval Base while an Ensign, U. S. Navy, 1944-1946.

Employment:

1967, Professor of Chemistry, Brigham Young University, Provo, Utah.
1955-1967, Director of Research for the entire University and Professor of Chemistry, Brigham Young University, Provo, Utah.
1948-1955, Research Associate, General Electric Research Laboratory, Schenectady, New York.
1942-1944 & 1946, Chemist, U. S. Bureau of Mines, Salt Lake City,
1940-1942, Chemical Analyst, Sperry Flour Mills, Ogden, Utah (par
1939-1940, Photographer, Checketts Photo, Ogden, Utah.

Military Service:

Ensign, U. S. Navy, 1944-1946.

Consulting:

1957----, for various industrial and governmental organizations.

H. TRACY HALL
Distinguished Professor/ Chemistry/College of Physical and Mathematical Sciences

B.S., 1942, Univ. of Utah
M.S., 1943, Univ. of Utah
Ph.D., 1948, Univ. of Utah
HON, 1971, BYU
Spouse: Ida Rose Langford

Honorary Positions:

President, Utah Academy of Sciences, Arts and Letters, 1960-1961.
Chairman, Salt Lake Section, American Chemical Society, 1959.
Fellow, American Association for the Advancement of Science, 1960----.
Editorial Board, "Inorganic Chemistry," 1961-1964.
Editorial Board, "The Review of Scientific Instruments," 1966----.

Awards:

1965, The National Association of Manufacturer's "Modern Pioneers in Creative Industry Award," The Waldorf Astoria, New York City, Dec. 2.

1965, The American Chemical Society, Salt Lake Section's "Utah Award," U. of Utah, Salt Lake City, Dec. 9.

1965, The Brigham Young University's "James E. Talmage Scientific Achievement Award," Baccalaureate Exercises, Provo, Utah, May 27.

1964, Third Annual "Olin Mathesen Lecture," Yale University, New Haven, Conn., April 22.

1964, First "Annual Faculty Lecture," Brigham Young University, Provo, Utah, April 8.

1962, The American Society of Tool and Manufacturing Engineers "Research Medal."

1959-1963, Alfred P. Sloan Foundation Research Fellow.

Other Honors:

Featured in the Man Made Diamond Exhibit, Federal Science Building, Seattle World's Fair (1962) and also in the Smithsonian Institute, diamond exhibit in Washington, D. C.

Professional Societies:

American Chemical Society, American Association for the Advancement of Science, The American Physical Society, The Mathematical Association of America, Sigma Xi, Phi Kappa Phi, Timpanogos Club of Utah.

Major Scientific Achievements:

1. The first synthesis of diamond (1954). This feat had eluded scientists for over 150 years.
2. The first high pressure, high temperature apparatus, "The Belt." (1000, 000 + atmospheres, simultaneously with 2000 + ^{o}C.) (1953).
3. Determination of the first melting curve under high pressure, high temperature conditions (for Germanium) (1954).
4. The second high pressure, high temperature apparatus, "The Tetrahedral Press," which circumvented the proprietary interest that prevented use of the Belt for research after leaving General Electric's employ (1956).

5. The first high pressure, high temperature X-ray diffraction apparatus (with J. Dean Barnett) (1962).

6. Discovery of the first pressure-induced phase change from a close-packed to non-close-packed structure (FCC to BCC in Ytterbium at 40 kb.), (with J. D. Barnett and Leo Merrill) (1963).

7. The determination of the nature of the "resistance cusp" in cesium. This intriguing problem had remained unsolved since discovery of the cusp by P. W. Bridgman in 1951 (with Leo Merrill and J. Dean Barnett) (1964).

8. The concept of "Periodic Compounds" (1965).

Brief Biographical Sketch/Dr. H. Tracy Hall

Parents: Howard and Florence Tracy Hall

Born: October 20, 1919

Married: Ida-Rose Langford September 24, 1941

Children: 5 daughters and 2 Sons

Grandchildren: 35

Education: Ph. D. in Chemistry and Physics, University of Utah 1948

Major Employments:
Sperry Flour Mills,
U.S. Bureau of Mines,
General Electric Research Laboratory,
Brigham Young University
Megadiamond
H. Tracy Hall, Inc.

Military Service: U.S. Navy World War II

Major Scientific Accomplishment:
First person to transform graphite into diamond, December 16, 1954 at the General Electrc Research Laboratory in Schenectady New York. Scientists had been trying to accomplish this for 150 years before his invention of a high pressure high temperature machine that could generate the needed conditions to do this. This machine is called the "Belt".

Later on: Invented the "Tetrahedral Press" and the "Cubic Press" which also have diamond making capabilities. All three machines are also used in Scientific research.

Major Awards from Scientific organizations: About fifty

Peer reviewed scientific papers: about one hundred

Patented inventions: 19 U.S., 70 foreign

DR. HALL AND HIS DIAMOND BELT

by Lewis Church

Through the centuries, great unsolved problems have existed in the minds of scientists and pseudo-scentists alike. Outstanding among those problems was that of transforming a base substance in to a noble one. Many alchemists spent their entire lives trying to make gold from lead or other cheap material. Little did they realize that a great deal more was involved in converting one material into another besides reciting magical words and burning incense over their equipment.

Later, alchemists broadened their activities to include attemts to make diamond from its basic constituent, carbon. Nothing spectacular was achieved in this respect until 1893, when the French chemist, Henri Moisson, claimed to have successfully made diamonds by dissolving charcoal in molten iron then plunging the solution into cold water. He said extreme temperature changes which came about in the cold water caused the outer layers of iron to contact, thus subjecting the dissolved charcoal to extreme pressures which formed diamond. Because nobody has been able to achieve the results Moisson did, and because of recent advances in high-pressure research, it is believed that he did **not** actually make diamonds.

In 1941, a group of scientists at General Electric Company commenced anew to find the secret of how diamonds are made. The fruits of this $2,500,000 research project wrote the final chapter of the age old story of searching for the true method of changing common carbon, such as we find in a lump of coal, into that most enchanting of all crystals: diamond.

DR. TRACY H. HALL

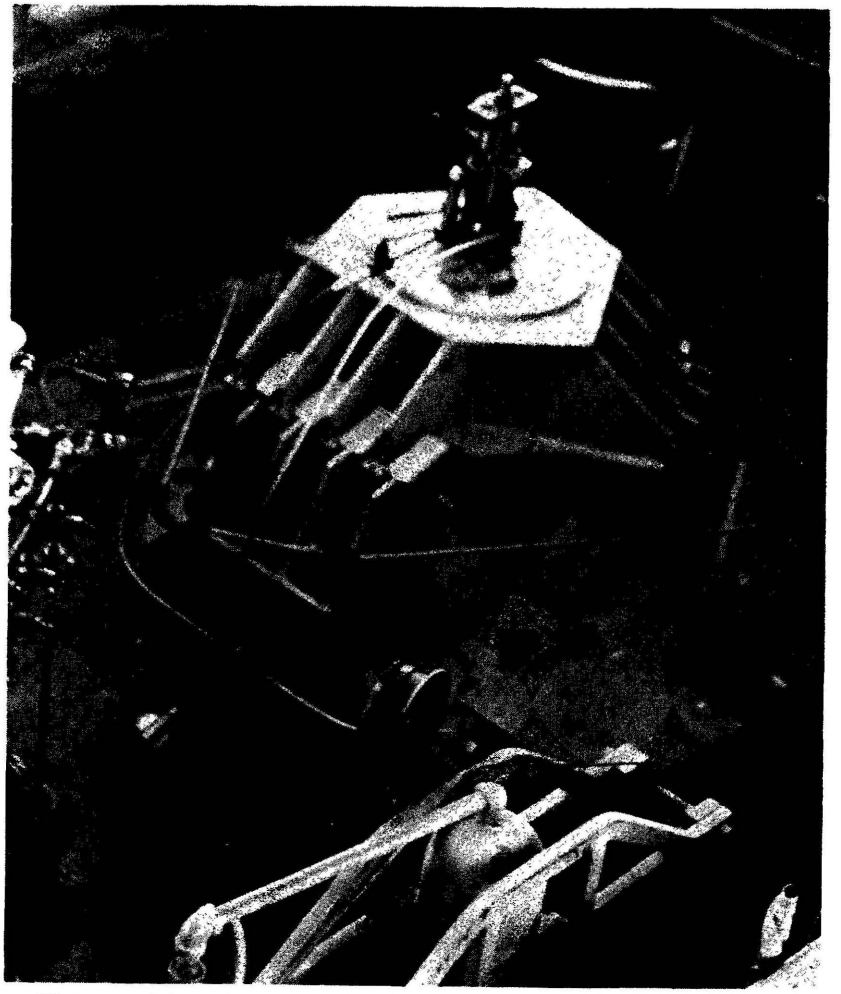
After careful study and consultation with such authorities on high pressures as P.T. Bridgman, the G.E. scientists decided that in order to synthesize diamond in their laboratory, they would have to impose high pressure and high temperature on their carbon samples.

World War II caused the research to come to a standstill until 1950 when two physicists, F.P. Bundy and H.M. Strong, were reassigned to the project. A year later, in 1951, H. Tracy Hall joined the research tetam as a physical chemist.

Dr. Hall's natural drive to get things done in a hurry prodded him through his work with the chemical problems involved with the synthesis of diamond, and he found himself presented with the opportunity to run some experiments with his chemicals under high pressures and high temperatures. The hydraulic apparatus he used in these experiments failed to create the necessary conditions to form diamond, so he set out to design his own high-pressure equipment.

On December 31, 1952, he conceived an idea for a pressure transfer device which was supposed to be able to achieve the required pressures and temperatures. When tested, it didn't yield the expected results, so its design was revised a month later. However, Hall had difficulty obtaining funds for the building of his second and superior pressure transfer device because of the failure of his first invention.

Impatient to try out his new invention, Dr. Hall asked shop per-



This machine, invented by Dr. Hall, utilizes extremely high temperature and pressure to form dark colored man-made diamonds.

Galaxy May 29 - 1969

sonnel to build his new "belt" apparatus during spare time. By December 1953, officials at General Electric became convinced of the worth of Hall's invention and supported its construction.

The "belt" consisted of several concentric rings or belts, forming a doughnut-like structure with two pistons which fit into the hole of the "doughnut," one from either side. The carbon sample was compressed between the pistons. It was quickly determined that this device could achieve a pressure of 100,000 atmospheres (1,470,000 pounds per square inch) while maintaining temperatures of the order of 3000 degrees centigrade, the two most important conditions for the synthesis of diamond.

For nearly a year, Dr. Hall patiently experimented with carbon in combination with other chemical agents using his "belt" device. Then on December 16, 1954, he pushed back the cover to the chamber of his equipment and saw in the morning sunlight the sparkle of the first man-made diamonds.

Success at last. Hall's hands trembled a bit as he carefully removed the tiny crystals from their birthplace for a closer look. He sunk into a nearby chair for few minutes until he had regained his composure. Diamonds. Man-made diamonds. The dream of scientists for centuries, and he had fulfilled it.

In spite of his intense excitement at the moment of discovery, Dr. Hall witheld final judgment on the genuineness of his crystals until they could be subjected to rigorous tests. Hardness, chemical makeup, and crystal structure are just a few of the criteria which had to be met, but the most important test of all was whether the process of synthesis could be repeated.

Because his crystals met all these criteria and even surpassed some of them, the man-made diamond industry has grown into a $50,000,000 a year business. The price of man-made diamonds, however, has steadily decreased from $4.25 a carat, when first offered for sale in 1957, to the present price of $2.74 a carat.

The entire output of the diamond industry is used industrially as an abrasive agent. Drills and grinding devices made with man-made diamond grit last from 15 per cent to 70 per cent longer than those made with natural diamond grit.

As most things which are considered difficult and obscure at first, diamond making is really quite simple if one has good equipment and the necessary raw materials coupled with the know-how and inventiveness such as those brought to General Electric by Tracy Hall.

Now director of the Division of Research at Brigham Young University, Dr. Hall is regarded as the world's leading authority in ultrahigh-pressure-temperature research. Every year many scientists from various parts of the world travel to Provo, Utah to see his work and consult with him. His office is deluged with letters and telephone calls every day from scientists in universities and other research institutions requesting advice and information on the science of high pressures.

Under Dr. Hall's leadership, Brigham Young University has risen to a place of leadership in the world in ultrahigh-pressure-temperature research.

Some words about. . .

Agency, Privacy and Prayer

SUFFICIENT

Leave the galaxies
Alone; who cares
For inter-stellar
Strife? This tiny

Drop of milky
Way in which
We live is
Plenty big for

Me to swim in—
Quite enough to
Drown in if I
Don't watch out.

—Carol Lynn Wright

SMALL MERCY

I am so glad
That no one has
Invented yet a
Seismograph for

Heartbreak; to
Plot a daily curve
Of quakes so
Carefully concealed

Would be, I think,
Unkind at least,
And at the most
Unbearable.

—Carol Lynn Wright

A MOTHER'S PRAYER AT TIME OF ILLNESS

The night has settled on the world
And cooling breezes blow;
Across the sky, the old moon creeps,
And tiny star lamps glow.
Now to my weary heart there comes
A luring call to rest.
If only I could doze a bit,
My baby on my breast!
Yet somehow, I must ever wake,
My lonely vigil keep—
I can't forsake,
And moonlit waters, still and deep,
Must never take me from my duty here,
Dear God, don't let me fall asleep.

—Mary Jordan Ricks

Personal Experiences in High Pressure*

By H. Tracy Hall, Distinguished Professor, Brigham Young University, Provo, Utah

On December 16, 1954, I discovered how to make diamonds. Others have claimed prior discovery. (The first claim to synthesis was made 142 years ago!) but there was something unique about mine. My method could be reproduced by others. Moreover, my method grew diamonds so rapidly and in such profusion that commercial production quickly followed. Now, industrial diamond grit is manufactured by every major nation, and the output can be measured in tons.

The way to discovery was not easy, and I should like to tell you a little concerning it and concerning subsequent events.

I always had wanted to work for General Electric, and I had informed my fourth grade school teacher of this desire in 1928. However, upon completion of the Ph.D. degree in chemistry twenty years later, I found this company to be disinterested in acquiring my services. I was persistent in seeking employment, however, and was hired—reluctantly—by the G.E. Research Laboratory in the fall of 1948.

Three years later I became the new addition to a small, loosely-knit group whose assigned task was to synthesize diamonds. There were two facets to this problem. Firstly, thermodynamics indicated that high pressure and high temperature would be needed. Equipment capable of generating the estimated pressure and temperature did not exist. Secondly, the chemistry of diamond formation was not known; i.e., did diamond form directly through polymorphic transformation of graphite, or were other starting materials required? Perchance carbonates, carbon monoxide or other carbon-containing compounds might react with other agents to produce diamond. Catalysts also might be needed.

The problems of the chemistry fell to my lot and for a time I eagerly pursued them. It soon became apparent, however, that the lack of suitable high pressure/temperature equipment was the more immediate barrier to a solution of the diamond-synthesis problem. High-pressure equipment had been partially planned, but was a long time away. The major portion of this equipment was an expensive, large, double-ram hydraulic press which was to provide driving and clamping forces for piston-cylinder type devices not yet designed. This hydraulic press was so expensive that the need for it had to be justified to the company president before purchase was permitted. Delivery time on this equipment was eighteen months.

I was impatient and began to ponder means of generating pressure and temperature that would not require this yet-to-be-delivered press, but could be used in an ancient hydraulic press already on hand. Although equipment design was outside my assignment, I designed, and was allowed to have constructed, a device later named the "Half-Belt." The Half-Belt gave higher steady-state pressures and temperatures than ever before had been achieved simultaneously. But because my colleagues felt negative about it when I proposed to build an improved version, the "Full-Belt" or just plain "Belt," the proposal was rejected, although the cost was less than a thousand dollars. I fretted about this for a time and then decided on a sub-rosa solution. Friends in the machine shop agreed to build the Belt, unofficially, on slack time. This took several months. Ordinarily, it would have taken only a week. The Belt, built of hardened steel, operated so successfully, in my view, that I desired to have the critical components constructed of cemented tungsten carbide. This would allow much higher pressures to be generated. Management, however, would not approve the purchase of the carbide.

There was some confusion at this time as to whom I was responsible to. My former supervisor assumed that I was on loan to Project Superpressure (the diamond project code name). I wasn't certain about this and neither was the manager of Superpressure. (Later it was decided that I belonged to Superpressure). At any rate, having been stopped by the Superpressure people, I appealed to my former supervisor and spoke at a seminar of his group concerning the Belt. He and his group were impressed and shortly thereafter permission was received to buy the carbide components.

With carbide, I soon advanced into pressure-temperature territory far beyond that known to man before. Pressures of 120,000 atmospheres or 1,800,000 pounds per square inch (on today's pressure scale*) simultaneously with temperatures of 1,800 degrees centigrade were maintained for several minutes.

These extreme conditions were thought to be more than sufficient to cause the direct transformation of graphite to diamond, but the sought-for change would not occur. I attempted many hundreds of indirect (mainly "carbon releasing") ap-

At the time, pressures were thought to exceed 150,000 atmospheres.

"In 1954 I discovered how to make diamonds. The way to discovery was not easy."

proaches over a period of about a year but to no avail, and I was becoming discouraged. Then, one wintry morning, I broke open the sample cell after removing it from the Belt. It cleaved near a tantalum disk used to bring in current for resistance heating. My hands began to tremble; my heart beat rapidly; my knees weakened and no longer gave support. My eyes had caught the flashing light from dozens of tiny triangular faces of octahedral crystals that were stuck to the tantalum and I knew that diamonds had finally been made by man. After I had regained my composure, I examined the crystals under a microscope. The largest, about 150 microns across, contained triangular etch and growth pits such as I had observed on natural diamonds. The crystals scratched sapphire and other hard substances, burned in oxygen to give carbon dioxide, and had the density and refractive index of natural diamond. A few days later, an x-ray diffraction pattern unequivocally identified the crystals as diamond.

This first successful experiment contained troilite (FeS) and graphite at a pressure near 70,000 atmospheres and a temperature near 1,600 degrees centigrade. Troilite is a mineral associated with the microscopic diamonds found in the Canyon Diablo meteorite. It now seems certain that the meteoritic diamonds were formed by the transient pressure and temperature generated on impact of the meteorite with the earth.

I was able to repeat this experiment successfully a dozen times in the next two weeks, learning during this period that iron alone could cause graphite to transform to diamond, but that sulfur alone would not. Tantalum also showed a beneficial effect. On Dec. 31, 1954, Hugh Woodbury, a company physicist, successfully duplicated my December 16th experiment and became the first person to duplicate the diamond synthesis claim of another. There had been a long history of chicanery, tomfoolery, bad faith, and downright fraud during the period of diamond-synthesis claims. Consequently, on January 18 and January 19 of 1955, official duplication experiments were carried out under the watchful eyes of company officials. I was not allowed to be present while Hugh Woodbury and Richard Oriani (a company metallurgist), using independent sources of FeS and graphite from those that I had used, each made three runs according to my procedure. I breathed a relieved sigh when diamonds were made in all six runs.

These runs, as well as the original run, were made in my Belt apparatus, which was actuated by the ancient press previously mentioned. This press used water for hydraulic fluid and leaked so badly that rubber footwear, mop, and bucket were standard accessory equipment. In addition, the press's hydraulic lines had been wrapped with rags to reduce the overhead water spray. Historic as this old Watson Stillman Press had now become, it was relegated to obscurity, for officially it was said that the first diamonds were made in the beautiful new double-ram press that now had been delivered.

The News Spreads Fast

Management, thus convinced of the authenticity of my synthesis, held an impressive press release on February 15, 1955. Within the next two days, most U.S. newspapers carried as front page news the story that diamonds had been made at the G.E. Research Laboratory in Schenectady, New York. Company advertising executives were quick to note that the value of this newspaper coverage far exceeded the cost of the Superpressure project. The press release gave no details concerning high-pressure equipment or the method of synthesis. A number of important U.S. scientists voiced objections to company officials for this secrecy. In a move to ward off further adverse comment and establish credibility, the company engaged the services of Nobel Laureate P. W. Bridgman, who wrote an article for *Scientific American* certifying that diamonds indeed had been made at G.E. But the secrecy continued for five more years.

In April of 1955 I decided to leave the company that I had aspired to work for in my youth. There were several reasons for doing this, most compelling among them the continued lack of financial support for the things I wished to do. I had come to "understand" the politics of the expensive double-ram press. After committing itself to this approach, management could not face a cheap alternative. But after synthesizing diamond I expected that money to be no object and could understand no longer. Incidentally, concerning the double-ram press, the two rams were tied together and a Belt was built for use therein.

On September 1, 1955, I assumed new responsibilities as director of research and professor of chemistry at Brigham Young University. Meantime, company officials had informed me that I could not use my Belt apparatus for high pressure/temperature research at the University, and this complication in my plans was reinforced by a secrecy order from the U.S. Department of Commerce.

I made several trips to Washington to confer with Commerce Department officials and some important scientists to determine how I might be able to continue research at high pressure. The "solution" to my problem dawned one day when a man from the Commerce Department said, "Hall, why don't you invent another apparatus?" I didn't appreciate the idea particularly, realizing that this might delay my work for several years. I asked the Commerce man if they would not also place a secrecy order on any apparatus I might invent that had the same pressure/temperature capabilities as the Belt. He said that they would not. I asked for a letter to that effect whereupon he assured me that I did not need a letter.

It would take money to experiment with new apparatus ideas. I approached the National Science Foundation (NSF). They were eager to help, but were cautious in view of the possible proprietary, national, scientific, and personal-interest conflicts that they sensed might exist. My first funds came from the Carnegie Foundation through the assistance of Philip

Abelson, who was very sympathetic to my dilemma. This broke the ice and funds soon also came from NSF. Then I was approached by the Army, Navy, Air Force, Atomic Energy Commission and other organizations proffering more money than I could accept in view of my administrative and teaching duties, which left only minimal time for research. The people who approached me from the government agencies were unanimously against the secrecy order and could not understand how such a thing had come to pass during peacetime. Furthermore, the defense agencies and the AEC had attempted to penetrate the secrecy. They were able to penetrate the Government secrecy, but always were stopped by the proprietary secrecy. Consequently, they heartily encouraged me to invent a new apparatus that would be free and open for all to use. To me, a frustrated inventor in my attempts to get at the heart of the matter, it appeared that the proprietary secrecy hid behind the Government secrecy and vice versa. It required four years of effort by various interests to have the Government secrecy removed, and several months following this for the proprietary secrecy to end. For all these years the secrecy plagued and hindered my efforts.

Secret and Not Secret?

I had many ideas on which to work, but constantly wondered where the dividing line was between what was secret and what was not. Again, I journeyed to Washington to consult with Commerce. They could not enlighten me other than to say that if a new apparatus invention did not infringe the Belt invention, I would have no problems. But they declined to make this judgment, stating that under the circumstances I was the only person who could make the determination and must personally assume the risk of violating the secrecy order (2 years in jail, $10,000 fine).

While I had funds sufficient to pay for the machining of parts, I ran the lathe myself, in secret. I also personally attended to the hardening of the alloy steels and the fabrication, assembly, and testing of the various components and devices. There was no way I could make tungsten carbide parts, and I considered having such parts made outside too risky. However, I managed to obtain 60,000 atmospheres at 2,000 degrees Centigrade in alloy steel devices without carbide. I concluded, though, that these particular devices were too much like the Belt and might violate the secrecy order. It was indeed hard to move away from the Belt idea. I worked a great deal with piston-cylinder devices, with a stepped piston, and with a device called the Black-Hawk Special. For diversion, I tried for extremely high temperatures at modest pressures to 10,000 atmospheres in a sort of "confined" exploding wire device. One day I connected the full 20,000 watts available from the Lab mains to this device and it exploded, spewing molten refractory and metal and depositing them as a ring around the inside of an 8-foot-diameter concrete pipe used for a safety enclosure. The estimated temperature was 60,000 degrees Centigrade.

A Tetrahedral Press

By summer 1957 I had the device that eventually freed me for a continuation of my high-pressure researches. It could do everything that the Belt could and more. I called it the Tetrahedral Press. But never have I had so much anxiety and so many sleepless nights. It all revolved around ascertaining that the tetrahedral press did not infringe on the Belt and thus did not violate the secrecy. I finally decided that it positively did not and submitted a paper on the new apparatus to the Review of Scientific Instruments, filed for a U.S. Patent, and prepared a talk for the spring 1958 meeting of the American Chemical Society in San Francisco. The ACS talk drew a very large crowd and was the starting point for a new type of experience for me. Soon, hundreds of scientists from all over the world were to come to Provo to learn of the high-pressure methods. Over fifty commercial, governmental, and educational organizations within the next few years were to engage me as a consultant. I was constantly called upon to lecture, and the press, radio and T.V. insistently sought me out.

In the midst of this came another traumatic period when a letter from the U.S. Department of Commerce containing a secrecy order on the Tetrahedral Press arrived. The man from Commerce had not honored his word. Included in the secrecy order was a directive that I should inform everyone that knew of the Press that it was now a secret and conveyance of this secret to another was an act subject to the 2-year prison sentence and $10,000 fine. What a problem! How could I possibly inform the thousands of worldwide readers of the *Review of Scientific Instruments* of this? And what of those at the ACS meeting? Again a trip to Washington became necessary. Commerce finally decided that I would only be required to inform those who had personally seen the Tetrahedral Press plus those who had sent written requests for reprints describing the device. At this time, this amounted to over one hundred persons, some of them foreigners. I followed the directive, but confess to having felt rather awkward about it all, particularly in writing to the foreign scientists. Some American scientists, upon receipt of my letter, thought the whole affair horrendous and so informed the Commerce Department. In exasperation, I considered giving up the field of high pressure.

Secrecy Is Lifted

Fortunately this secrecy order lasted for only a few months. The secrecy was lifted in the following manner. A hearing was being held in Washington concerning the secrecy order. Commerce was adamant on maintaining the secrecy; those in opposition had just lost another round in the struggle; and the meeting was being closed when a messenger arrived. At first he was refused admission, but on presenting credentials, he could not be excluded. He was from the Pentagon and had a message from the top. The written message, simple and direct,

amounted to the Pentagon's "pulling rank" on Commerce. It was a directive that the secrecy order be lifted immediately on the Tetrahedral Press, the Belt, and the method for synthesizing diamonds. A plea by G.E. for delay to get its patents in order was granted, but secrecy on the Tetrahedral Press was terminated immediately. The secrecy order, in effect, gave several additional years of patent protection (and without disclosure) to the Belt and diamond patents. The patent on the Tetrahedral Press was granted (including all claims as initially filed) on the first office action five months before the patent on the Belt was issued, giving resounding support to my conviction that the Tetrahedral Press did not infringe on the Belt.

The lifting of the secrecy order ushered in a period of tranquility that I had not enjoyed for six years. A great many things of interest have happened in the decade since secrecy ended that I do not have time to tell. Suffice it to say that my activities in high pressure have expanded and continued, and that I have been involved in several interesting discoveries.

Fifteen years ago very little research was being done in high pressure. Today, there are 600 high-pressure laboratories and 1,000 high-pressure researchers, and 1,000 high-pressure papers are published each year. It seems possible that much of the impetus for this expansion stems from that December day of 1954 when I discovered how to make diamonds.

RIDGWAY, PA.
RECORD
D. 4,000

MAR 12 1971

Dr. Hall to speak at joint meeting

At a joint meeting of technical societies, the Penn-York Section of the American Chemical Society will co-sponsor a talk entitled "Manufactured Diamond" by Professor H. Tracy Hall on March 16 at 8:00 p.m., St. Marys High School, St. Marys, Pennsylvania.

Dr. Hall, currently Distinguished Professor at Brigham Young University, has been employed by companies, such as General Electric and has consulted for various industries and governmental agencies, in addition to being the recipient of a number of awards which include the American Institute of Chemist's "Chemical Pioneer Award" and an Alfred P. Sloan Foundation Research Fellowship. An experienced and interesting lecturer, Professor Hall has made scientific breakthroughs in the construction and application of ultra-high pressure and high temperature apparatus which have led to the first artificial synthesis of diamond in 1953. His prolific and pioneering work, supported by research grants totaling over one million dollars, has resulted in many publications and a number of patents.

The joint meeting will be preceded by a dinner for members and guests at 6:45 p.m., St. Marys Country Club, St. Marys, Pennsylvania. Reservations for the dinner should be made with Mr. Charles Brininger, Jamestown Community College, Jamestown, N.Y. 14701. Interested persons are invited to attend the talk free of charge.

Paris Buys University Equipment

9-21-1964

Dr. H. Tracy Hall, first man to produce synthetic diamonds and director of research at BYU, leaves Monday for Paris where he will direct the assembly and testing of a $175,000 research machine developed here.

THE MACHINE, named the Tetrahedral X-ray Diffraction Press, uses a beam of X-rays to probe matter while it is subjected to very high pressures and temperatures.

It was conceived by Dr. Hall and Dr. J. Dean Barnett in 1959 and has been improved and perfected in the University's research laboratories.

Producing pressures of three million pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, thus creating materials which are unknown in nature.

DR. HALL will install the machine in the Paris Laboratories of the French Atomic Energy Commission for fundamental studies on the nature of matter.

The machine, built for France, was under construction about six months. It was assembled and tested in Baxter Springs, Kansas, then disassembled and packed for overeas shipment.

USE OF THIS invention is licensed by the Research Corporation of New York City, patent management agent for BYU. The corporation authorized the McCartney Manufacturing Co. of Baxter Springs to make the press.

The president of McCartney Co., George Frere, will join Dr. and Mrs. Hall in New York .

Dr. Hall came to BYU in 1955 as a professor of chemistry and director of research. He left a position as research associate in succeeded in making diamonds. General Electric, where he had

At BYU he has continued high-temperature, high-pressure experiments with development of even more efficient machines. His research has led far beyond the synthesis of diamonds into discoveries in materials science, geology, solid-state physics, chemical synthesis and engineering.

Fred A. Rosenstock

H. Tracy Hall

Wetzel O. Whitaker

5-7-71

At commencement

Three honorary doctorates conferred

Three honorary doctorates will be conferred at BYU commencement exercises May 28, it was announced recently by retiring President Ernest L. Wilkinson.

Recipients and their degrees are:

Fred A. Rosenstock, nationally recognized scholar in the field of western Americana, honorary doctor of humanities.

Dr. H. Tracy Hall, first man ever to produce artificial diamonds in the laboratory, honorary doctor of science.

Wetzel O. Whitaker, producer and director of over a hundred LDS films, honorary doctor of fine arts.

The honors will be conferred at services beginning at 9:30 a.m. in the Fieldhouse. The academic procession will begin from the flagpole at 8:45 a.m.

Born in Austria, Mr. Rosenstock immigrated to the U.S. just after the turn of the century. He has lived in Denver, Colo., for over half a century where he operates the Old West Publishing Company. It has become a symbol of interesting source materials relating to the history of the west, as well as fine workmanship in printing, illustrating, and binding.

He has gained wide recognition for printing productions of many books on western history. Two of his productions have received national acclaim for scholarly research and fine printing.

Over the years Mr. Rosenstock has assisted hundreds of western historians and literary authors in their attempts to secure authentic information and background data. He is especially known for his role as a builder of special collections. For several years he has aided in the development of the J. Reuben Clark Library at BYU.

Dr. Hall came to BYU in 1955 as professor of chemistry after leaving a position as research associate at General Electric Co , Schenectady, N.Y., where he had succeeded in making diamonds. He received the B.S., M.S. and Ph.D. degrees in physical chemistry from the University of Utah.

At BYU Dr. Hall invented a new process, the tetrahedral X-ray diffraction press, to continue his high pressure high temperature studies, and has approached conditions inside the earth and stars, repacking the atoms to create materials which are unknown in nature. His work has revolutionized the diamond industry and practically eliminated the problem of strategic diamond materials for industry.

In 1970 Dr. Hall was chosen to receive the Chemical Pioneer Award of the American Institute of Chemists. In 1965 he received the distinguished service award of the Salt Lake Section, American Chemical Society, and the "Modern Pioneers in Creative Industry" award of the National Association of Manufacturers.

Mr. Whitaker attended the American Academy of Fine Arts and the Chicago Institute of Art. He worked for 20 years at Disney Studios where he became supervising animator, receiving screen credit on such films as "Alice in Wonderland," "Peter Pan," "Cinderella," and countless short subjects.

He created the film productio unit on the BYU campus in 195 and he and his staff have bee instrumental in producing ove 100 films and many film strips fo the LDS Church. These films hav been translated into 14 differen languages.

Largest Manufactured Diamond Made Here

The largest known manufactured diamond in the world—a 20-carat cylinder larger than a toothpaste cap—has been produced by a team of Utah scientists after years of intensive research in a secluded Provo laboratory.

Dr. Harvey Fletcher, former director of the Bell Research Laboratory, called the achievement one of "far-reaching significance," and Governor Calvin L. Rampton issued the following statement: "The creation of a multi-carat diamond by man is, without question, a technological breakthrough of the highest order. We are justly proud that this event has been achieved in Utah—proud of our Utah industry and proud of the extraordinary talent that chooses Utah as a place for man, for industry, for movement forward. Utah salutes Dr. Tracy Hall and Megadiamond Corporation."

DR. H. TRACY HALL holds 20-carat Megadiamond T cylinder—world's largest known man-produced diamond. The material, expected to find widespread use throughout industry, was made possible by a first-of-its kind process perfected by Dr. Hall and his associates at the Megadiamond Corporation laboratory in Provo.

Dr. H. Tracy Hall, who in 1954 became the first man to accomplish a confirmed synthesis of diamond, unveiled the unpolished gray blackstone at his tree-cloistered Megadiamond Corporation laboratory on the outskirts of Provo this morning.

Dr. Hall is president of Megadiamond and is a distinguished professor at Brigham Young University. Dr. Hall said the process breakthrough that made possible creation of the stone, called Megadiamond T, is more significant than his initial discovery of how to make diamond. "It is the harbinger," Dr. Hall said, "of an exciting new era in industrial diamond technology."

Dr. Hall explained that the application of this industrial diamond is expected to revolutionize the diamond die and tool industry. Megadiamond is now producing diamond dies, lathe cutting tools and a Megadresser. The dresser is a gem-quality application and Dr. Hall expects to take over the tungsten

(Continued on Page 2)

Herald 9-29-50 HALL, HOWARD TRACY SR.

Chairman, Salt Lake Section of American Chemical Soc. 1959.
President, Utah Acad. of Sciences, Arts, and Letters, 1960-61
National Academy of Sciences Materials Advisory Board Member - Plasma Physics and Techniques and Instrumentation.
Scientific Consultant to Government and Industry.

H. Tracy Hall

DIALOG File 234: MARQUIS WHO'S WHO-82-85/JUL COPR. MARQUIS WHO'S, INC 800/621-9669

PhD, Brigham Young U, 1963;
postgrad Oxford U, 1963-1965
CAREER:
Research group leader Kerr-McGee Corp, Oklahoma City, OK, US, 1967-1969;
mgr bus analysis Kerr-McGee Corp, 1969-1972;
sr planning analyst Kerr-McGee Corp, 1972-1975;
mgr tech devel Kerr-McGee Corp, 1975-1977;
mgr research and devel Kerr-McGee Corp, 1977-1979;
mgr tech center Kerr-McGee Corp, 1979-1983;
pres tech ops Kerr-McGee Corp, 1983-present
AWARDS:
NIH fellow, 1963-1965
MEMBERSHIPS:
Mem Am Chem Soc;
Mem Am Inst Chem Engrs
OFFICE:
PO Drawer 25861
Oklahoma City OK 73125 US

310651 WA42~WA43 BIOG UPDATE: 19831212
Hall, Howard Tracy
OCCUPATION(S): chemist
BORN:
October 20, 1919 Ogden, UT US
PARENTS: Howard Hall and Florence Tracy Hall
SEX: Male
FAMILY:
married Ida Rose Langford, September 24, 1941; children-Sherlene, Howard Tracy, David Richard, Elizabeth, Virginia, Charlotte, Nancy
EDUCATION:
AS, Weber Coll, 1939;
BS, U Utah, 1942;
MS, U Utah, 1943;
PhD, U Utah, 1948;
DSc (hon), Brigham Young U, 1971
CERTIFICATION: registered patent agt
CAREER:
Chemist US Bur Mines, Salt Lake City, UT, US, 1942-1944, 1946;
research asso Gen Electric Research Lab, Schenectady, NY, US, 1948-1955;
dir research, prof chemistry Brigham Young U, 1955-1967;
disting prof chemistry Brigham Young U, 1967-1980;
disting prof emeritus Brigham Young U, 1980-present
Contbr articles to profl jours
MILITARY:
Served as ensign USNR, 1944-1946
AWARDS:
co-recipient Research medal Am Soc Tool Mfg Engrs, 1962;
Modern Pioneers Creative Industry award NAM, 1965;
Engring Materials Achievement award Am Soc Metals, 1973;
Man of Yr award Abrasive Engring Soc, 1980;
Alfred P Sloan Found research fellow, 1959-1963;
Chem Pioneer award Am Inst Chemists, 1970;
Creative Invention award Am Chem Soc, 1972;
co-winner Internat Prize for New Materials Am Phys Soc, 1977
MEMBERSHIPS:
Fellow Am Inst Chemists;
Fellow AAAS;
mem Am Chem Soc;
mem Am Phys Soc;
mem Sigma Xi;
mem Phi Kappa Phi
POLITICAL AFFILIATION: Republican
RELIGIOUS AFFILIATION: Mormon
CLUBS AND LODGES: Timpanogos
ACHIEVEMENTS: Patentee in field Pioneer in synthesizing of diamond
HOME:
1711 N Lambert Ln
Provo UT 84601 US

OFFICE:
Dept Chemistry
Brigham Young Univ
Provo UT 84602 US

1317931 WA43 BIOG UPDATE: 19830000*
Handley, G Kenneth
OCCUPATION(S): holding company executive
BORN:
1906
SEX: Unavailable
EDUCATION:
BA, Brigham Young U, 1928;
MBA, NYU, 1931
CAREER:
vp Mfrs Hanover Bank, 1930-1957;
ptnr JA Hogle & Co, 1959-1964;
with Imperial Corp Am, San Diego, CA, US, 1961-present:
chmn bd, chief exec officer Imperial Corp Am, San Diego, CA, US, 1979-present;
dir Imperial Corp Am, San Diego, CA, US;
dir Olson Farms Inc
OFFICE:
Imperial Corp Am
8787 Complex Dr
San Diego CA 92123 US

1283992 WA43 BIOG UPDATE: 19830000
Haney, Raymond Lee
OCCUPATION(S): gas and electric company executive
BORN:
December 9, 1939 Piedmont, KS US
PARENTS: Carl Wilburn Haney and Imogene Johnson Haney
SEX: Male
FAMILY:

(cont. next page)

BYU ALUMNI
HOMECOMING AWARDS
NOMINATION FORM

1 February is the deadline for nominations.

For: (Please check one.)

☒ Alumni Distinguished Service Award ☐ Alumni Service to Family Award ☐ Honorary Alumni Award

INFORMATION ON NOMINEE

Name Hall (LAST) H. Tracy (FIRST, MIDDLE) ____ (MAIDEN (if applicable))

Address ____ (STREET) Provo (CITY) UT (STATE/COUNTRY) ____ (ZIP)

Dates Attended ~~BYU~~ UofUT 1942 BS 1943 MS Phys. Chem. PhD 1948 Telephone (____) ____

Specific reason for nomination: (If needed use reverse side.)

This is the man who invented the synthetic diamond. He continued his work on creation of materials under high pressure, and developed more than 100 new materials never before synthesized. He and his work are clearly world-famous. He has awards from professional societies. Holds 17 U.S. and 70 foreign patents for his work. He retired from full-time teaching at BYU in 1981. At age 61 he bought $1,500 worth of law books, passed the patent law section of the bar exam, and became a patent agent.

As the director of research at BYU, he established the university as the leading center for high-pressure research in the world. He brought in over a million dollars in funding (this was 1957 and the 60s, when a million was worth something). He donated the royalties from many patents to BYU.

I have lived in the same ward with one of his daughters- he was a wonderful father, devoted to his family. He was always active in the church. He is in his late 70s, so we shouldn't delay giving him an award.

Nominated by Barthelomew (LAST) Dan (FIRST) *Telephone* (____) ____

Address ____ (STREET) (CITY) (STATE/COUNTRY) (ZIP)

Here are the names, addresses, and telephone numbers of three other people who may have additional information for this nomination:

Return this form to: Brigham Young University, Alumni Awards, PO Box 22440, Provo, UT 84602-2440

1

H. Tracy Hall Honorary Alumni Award

Those acquainted with H. Tracy Hall might say that he does his best work under pressure. In 1954 while working on a research team at the General Electric Research Laboratory, he invented "the Belt," a device capable of generating the extremely high pressures and temperatures needed to transform graphite into industrial diamond. Most important, his methods could be reproduced by others.

Tracy's invention was considered so important that a federal government secrecy order was placed on it. When he was hired as a professor of chemistry and director of research at BYU the following year, the restriction kept him from using his own device. Within a year, however, he invented the Tetrahedral Press, which had capabilities equivalent to the Belt. Then a secrecy order was placed on *it*.

About two years later the order was removed from his inventions, and he was free to pursue his endeavors in high pressure–high temperature research. During the next decade, Tracy and his colleagues published about 150 peer-reviewed scientific papers, attracted the attention of scientists from all over the world, and obtained more than $1 million in grants for research. At age 61 he tutored himself to pass the patent law section of the bar exam and became a patent agent.

The recipient of numerous awards from professional societies,

Tracy holds 17 U.S. and 70 foreign patents, including one for his newest invention: the "Cubic Press."

Five diamond manufacturing companies are located in the Provo area, and like others, they all use Tracy's machines. At one of these companies, Megadiamond Corporation, Tracy and his associates have produced new shapes and larger sizes of synthetic diamonds.

From small boy, scientist grew

APR -9 1974

By Dorothy O. Rea
Deseret News staff writer DESERET NEWS

PROVO — The portrait of one of the world's great scientists starts with a very small boy telling his teacher, "When I grow up I will be a chemical engineer and work for General Electric."

The boy was H. Tracy Hall. The teacher was Beulah Stallings. The scene was a four-room country school in Marriott, Utah.

"When my father and I would go into town for food, we stopped at the library where I could check out science books. Edison and Ford were my ideals when I was a child. I suppose I always knew I would be a scientist," Hall said.

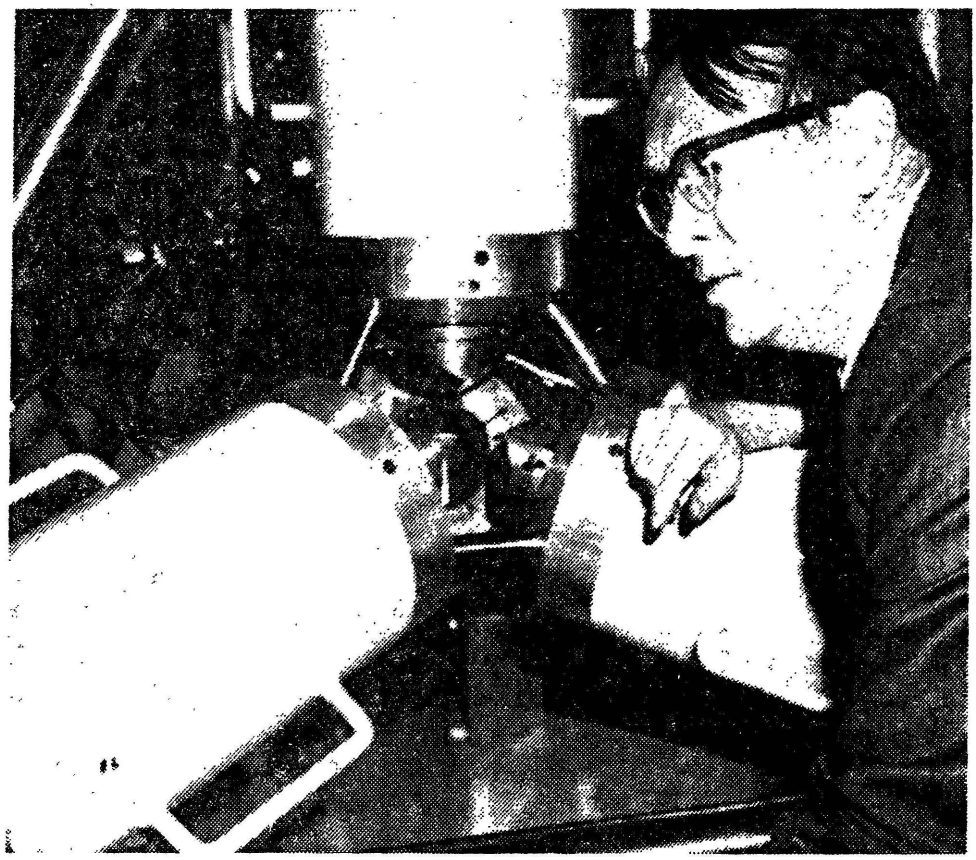
"My mother was a patient helper. She didn't complain when I took her sewing machine apart or sawed wood on the dining room table."

Those who recall the Depression of the early 1930s understand the struggle of the young man as he worked as a farmhand or did janitor work at Weber College for 15 cents per hour.

"When we moved off the farm and went to Ogden, my father was able to rent a house in a brickyard for $8 a month," he recalled.

Dr. Tracy Hall realized his childhood dream. When he received his doctorate in chemistry in 1948, many companies offered to

See FROM on Page B-11



Dr. Tracy Hall shows machine which probes matter under pressure.

Father, Son Will Both Get Chemist Awards

A famous BYU scientist and his son both will be honored this month by the American Institute of Chemists.

Dr. H. Tracy Hall, distinguished professor of chemistry who was the first man to produce synthetic diamonds, will leave for Pittsburgh, Pa., next Wednesday to receive the Chemical Pioneer Award of the American Institute of Chemists.

On the same day, his son, Tracy Hall Jr., will receive the medal of the Institute as the outstanding BYU senior chemistry student during the annual awards banquet of the BYU Chemistry Dept.

Dr. Hall is one of five "chemical pioneers who have shaped industry" chosen to receive the honor at the annual meetings of the Institute May 14-16 at Webster Hall Hotel and Mellon Institute.

Dr. Hall came to BYU in 1955 as professor of chemistry and director of research, leaving a position as research associate in General Electric Co., Schenectady, N.Y., where he had succeeded in making diamonds.

At BYU he has continued high-temperature, high-pressure experiments with the development of more efficient machines on an altogether different principle from that he used at General Electric Company.

The latest machine developed by Dr. Hall is the Tetrahedral X-ray Diffraction Press, which uses a beam of X-rays to probe matter while it is subjected to very high temperatures and pressures. Producing pressures of 3,000,000 pounds simultaneously with pressures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, repacking the atoms to create materials which are unknown in nature.

* 5-8-1970 Page 3 Utah

TRACED - FOUND

OCT 7 1970

From four-room school to labs of giant corporation

Continued from Page B-1

hire him. "There was no offer from General Electric. I wrote to them and asked for an interview, saying I would be in the eastern states investigating job offers.

"They discouraged making the trip to Schenectady, N.Y., but did agree to an interview, and when it was over, it was plain they didn't want me. My own insistence and help from a young apprentice executive finally got me hired."

The brilliant young scientist was on his way. "On Dec. 16, 1954, I discovered how to make diamonds. Others have claimed prior discovery, but there was something unique about mine. My method could be reproduced by others.

"Moreover, my method grew diamonds so rapidly and in such profusion that commercial production quickly followed. Now, industrial diamond grit is manufactured by every major nation, and the output can be measured in tons."

Not only had he succeeded in synthesizing diamonds, but he also had designed and directed construction of "the belt," a high-pressure device which marked the way for some 600 high-pressure research laboratories in operation worldwide today.

His invnetion was cloaked in secrecy by General Electric. The U.S. Department of Commerce felt that production of synthetic diamonds must be kept from foreign rivals.

Dr. Hall was invited by Dr. Ernest L. Wilkinson, then president of Brigham Young University, and Dr. Harvey Fletcher, university research director, to come to BYU for an interview in 1955.

"It was a bright April day and the campus was beautiful. I think I made up my mind before the interview, this is where I would like to be," Dr. Hall recalls.

It was at BYU that he produced a second pressure apparatus similar to the "belt." In 1967 came the latest machine developed by Dr. Hall. It is the Tetrahedral X-ray Diffraction Press, which uses a beam of X rays to probe matter while it is subjected to very high temperatures and pressures.

Producing pressures of 3 million pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall and his associates have approached the conditions inside the earth and the stars, repacking the atoms to create materials which are unknown to nature.

His research has led beyond synthesis of diamonds into discoveries in materials science, geology, solid state physics, chemical synthesis and engineering.

"It was at BYU that all secrecy was removed from the temperature-pressure processes," he said. "The advent of these machines has brought thousands of scientists here from all over the world."

He was named distinguished professor of chemistry at BYU and, among many other high awards, was given, in 1972, the American Chemistry Society Award for Creative Invention for "work contributing to the material prosperity and happiness of people."

A private enterprise now operating in Provo has brought further accomplishment and recognition to the scientist. He is associated with Dr. Bill J. Pope and Dr. M. Duane Horton, both professors of chemical engineering, in the Megadiamond Corp., 2275 N. 275 West, in Provo. The plant employs some science students part time and other chemists, physicists and chemical engineers.

Instead of diamond powder and diamond grits (used on griding wheels) the Megadiamond enterprise is concerned largely with new shapes and sizes of synthetic diamonds used in the industrial world in cutting tools.

The Megadiamond looks like a small round piece of charcoal. It has phenomenal strength and variable shape, alterable to many designs under laboratory presses.

"Megadiamond is comparable in toughness to carbonado (a polycrystralline diamond mined in Brazil). To cut carbonado, another diamond must be used, which is like cutting a board with a wooden saw.

"Megadiamond is comparable in toughness, but with heat and pressure can be formed inexpensively to almost any shape," Hall said.

The new enterprise has successfully produced the largest known manufactured diamond — a 20 carat cylinder.

Dr. Tracy Hall, the boy from Marriott, Utah, hasn't stopped. He's still studying and asking himself questions such as, "What's going on 400 miles inside the earth?" The man and his machines are getting some answers.

S

1. Name Hall, Tracy

Birth date

Place

Father

Mother

Home Address

Family - Brothers and Sisters

Marriage

Children

Present Residence

Death

2. Education - Schools and Degrees Director of Research, BYU 1955
at BYU 1948-1955
Major activities - Positions, Honors, etc.

3. Occupational Activities Made synthetic diamonds in Gen Electric
in N.Y.

4. Church Activities - Office held, Missions, etc.

5. Civic, Social and Honorary Affiliations

6. Governmental - War and Political

7. Autho[redacted] or Ar
Per[redacted]ls, F

8. Pictur

9. Trave

10. Genea

11. Donati
Alur

The Department of Chemistry
cordially invites you
to a reception honoring
H. Tracy Hall
upon his retirement from
Brigham Young University
to be held Friday, the third of April
nineteen hundred and eighty-one
from four to six o'clock in the
Music, Geology Conference Room - 257 ESC

H. Tracy Hall (Chemistry) presented "Industrial Diamond" at the Northern Ohio Section of the American Ceramic Society in Cleveland March 17. (Nolan Mangelson)

Page 10—THE HERALD, Provo, Utah, Friday, February 25, 1977

Dr. Hall to Get Science Prize

DR. H. TRACY HALL

Dr. H. Tracy Hall, distinguished professor of chemistry at Brigham Young University and the first man ever to create synthetic diamonds in the laboratory, will receive the International Prize for New Materials at a meeting of the American Physical Society on March 22 in San Diego.

Internationally recognized for his high pressure, high temperature research, Dr. Hall and his associates have created more than 100 new materials which never existed before in nature or never have been synthesized, a BYU news release states.

Dr. Hall joined the BYU faculty in 1955 and served as director of research for 12 years. He formerly was research associate in General Electric Company where he first succeeded in making diamonds.

At BYU he has continued high - temperature, high - pressure experiments with the development of more efficient machines, and his work has become world famous, the release adds. He has been honored with medals, citations, awards and honorary degrees by about 40 learned societies and universities. His research has resulted in nearly 90 scholarly papers, and he holds a number of patents.

The machine developed by Dr. Hall at BYU is the Tetrahedral X-ray Diffraction Press, which uses a beam of X-rays to probe matter while it is subjected to very high pressures and temperatures. Producing pressures of 3 million pounds simultaneously with temperatures of 10,000 degrees, he has approached the conditions inside the earth and stars, repacking the atoms to create materials which are unknown in nature, the BYU release explained.

Chemist at BYU receives award

Dr. Tracy H. Hall, a Brigham Young University chemistry professor and the first person to create synthetic diamonds in a laboratory, received Friday the Willard Gardner Prize of the Utah Academy of Sciences, Arts and Letters.

The prize is for the most significant contributions to the sciences in the state during the past five years. Along with the prize, Hall received a $1,500 stipend.

Hall received the award during an academy meeting at the University of Utah.

Dr. Henry Eyring, distinguished professor of chemistry at the U. of U., presented the award to Hall and praised him for his contributions to science.

"Dr. Hall's contributions to science are numerous, especially in regard to his development of a technique for synthesizing diamonds, and for his producing of further forms of synthesized diamonds," Eyring said. "His work has tremendously aided the exploitation of this very important industrial material."

Hall is internationally-recognized for his research on the creation of new materials at high pressure and high temperature. He has developed more than 100 new materials nonexistent in nature and never before synthesized.

SEP 15 1971

Utah Inventor Wins Award

SALT LAKE TRIBUNE

Special to The Tribune

PROVO — Dr. H. Tracy Hall, professor at Brigham Young University, has been named the winner of the 1972 American Chemical Society Award for Creative Invention.

The award is presented to inventors for work contributing to "the material prosperity and happiness of people." Dr. Hall received the award for his work in developing high-pressure, high-temperature apparatus needed to synthesize diamonds.

Y chemistry teacher wins science award

Dr. H. Tracy Hall

The first man to create synthetic diamonds in the laboratory, Dr. H. Tracy Hall, professor of chemistry at BYU, received the biennial Willard Gardner Prize of the Utah Academy of Sciences, Arts and Letters Saturday.

Delmont R. Oswald, general secretary of the academy, said the prize, which carries a stipend of $1,500, was awarded during the academy meetings at the University of Utah at 1 p.m. in the Union Building Little Theater.

Oswald said the prize is awarded in recognition of the most significant contribution in the sciences within the state during the five previous years.

Oswald said Dr. Hall is internationally recognized for his high pressure, high temperature research. He and his associates have created more than 100 new materials which have never existed before in nature or never have been synthesized.

The machine developed by Dr. Hall at BYU is the Tetrahedral X-ray Diffraction Press.

Oswald also said that while producing pressures of 3 million pounds simultaneously with temperatures of 10,000 degrees, Dr. Hall has approached the conditions inside the earth and stars, repacking atoms to create materials unknown in nature.

IDAHO FALLS, IDAHO
POST-REGISTER
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To get prize

POCATELLO — Dr. H. Tracy Hall, distinguished professor of chemistry at Brigham Young University and the first man ever to create synthetic diamonds in the laboratory, will receive the biennial Willard Gardner Prize of the Utah Academy of Sciences, Arts, and Letters Dec. 2.

Delmont R. Oswald, general secretary, said the prize carries a stipend of $1,500.

This week an officer of the American Society of Tool and Manufacturing Engineers made a special visit to the campus to personally deliver a plaque from ASTME to H. Tracy Hall. The plaque honors him for research work done while at General Electric Company. Inscription on the plaque reads: "1962 award for basic research into the science and techniques of producing manufactured diamonds." (Earl C. Crockett) 5-4-62

DES. NEWS FEB 28 1977

Group to honor BYU professor

letter sent 3-8-77

PROVO — Dr. H. Tracy Hall, distinguished professor of chemistry at Brigham Young University and the first man ever to create synthetic diamonds in the laboratory, will receive the International Prize for New Materials during an American Physical Society meeting March 22 in San Diego.

Dr. Hall and his associates have created over 100 new materials which have never existed before in nature or never have been synthesized.

Dr. Hall

Dr. Hall joined the BYU faculty in 1955 and served as director of research for 12 years. He formerly was research associate in General Electric Company where he first succeeded in making diamonds.

At BYU he has continued high-temperature, high pressure experiments with the development of more efficient machines and his work has become world famous.

The machine developed by Dr. Hall at BYU is the Tetrahedral X-ray Diffraction Press, which uses a beam of X-rays to probe matter while it is subjected to very high pressures and temperatures. Producing pressures of 3,000,000 pounds simultaneously with pressures of 10,000 degrees, he has approached the conditions inside the earth and stars, repacking the

BYU Aide Will Receive Chemical Society Honor

DESERET NEWS
APR 5 - 1972

PROVO (UPI) — A Brigham Young University professor will be presented the American Chemical Society's award for creative invention Monday in Boston, Mass.

A spokesman said Dr. H. Tracy Hall will be recognized for work contributing to "the material prosperity and happiness of the people."

His invention was the development of a high-pressure, high-temperature apparatus used to synthesize diamonds.

Hall, who will deliver a major address at the Boston meeting, was a chemist with the U.S. Bureau of Mines in Salt Lake City for three years before joining the General Electric Research Laboratory, Schnectady, N.Y.

He was named director of research and professor of chemistry at BYU in 1955 and was named distinguished professor in 1967.

The Daily Herald Monday March 17, 1997

Daily Herald photo/Brian Winter

Dr. Tracy Hall sits in front of the diamond press he invented which is now housed in the lobby of NovaTek in Provo.

Provo inventor father of synthetic diamond

The first person to turn a chunk of graphite into diamond used to play piano in a 1930's professional jazz band from Ogden. But H. Tracy Hall, Ph.D., a farm boy whose discoveries made General Electric rich in the synthetic diamond industry, doesn't see a news hook in such creative extremes.

"There happened to be a piano in the house," he explains matter-of-factly.

Karl Cannon

Patent Pending

And there happened to be science books in Ogden's Carnegie Free Library. So young Tracy Hall checked them out and read them, dreaming of one day working for General Electric as a scientist. After marrying the lovely Ida-Rose Langford and earning a Ph.D. in physical chemistry and physics from the U of U, Hall joined G.E. to complete all of his childhood dreams.

A couple of careers and 19 U.S. patents later, Hall sits comfortably in his Provo living room to tell me how he solved the "diamond problem."

Hall had been fascinated by the fact that graphite and diamond were chemically the same. Many had claimed to make diamond from graphite, but their claims could not be reproduced. Sir Charles Parsons even repeated all previous experiments, and many of his own, and concluded in 1922 that neither he nor anyone else had succeeded in making diamond.

In 1951, G.E. executives called its research associates together and asked for volunteers to tackle the diamond problem. Hall was the only chemist to volunteer, and so he got the job.

Hall was assigned to work out the chemistry, and a couple of physicists were assigned to invent pressure equipment but were unsuccessful. So Hall decided to design the equipment himself, and some at G.E. resisted his trespass. But he went on to design an ingenious pressure chamber with unique surface geometry that could channel much higher pressures (1 million pounds per square inch) simultaneously with extremely high temperatures (2,600 degrees Fahrenheit), something that had not previously been possible.

Static constraining rings surround the chamber, in which a graphite sample is insulated with a sandwich gasket of steel and pyrophyllite (also called "wonderstone") which is mined in South Africa. Electrical current is used to generate the high levels of heat. Hall named his device "the Belt" for its concentric, belt-like rings.

But the process of invention seldom goes smoothly. None of the first several hundred "pressure runs" was successful. Hall was becoming discouraged, and G.E. was considering abandoning the project.

Then, on the morning of December 16, 1954, Hall broke open a sample cell after removing it from the Belt's latest pressure run. His hands began to tremble and his heart raced when his eyes caught the sparkling light from dozens of tiny octahedral crystals that had synthesized in the sample. Hall had made diamonds!

The Belt was awarded U.S. Patent No. 2,941,248, and Hall was named the sole inventor. But Hall's euphoria over synthesizing diamond was dampened when G.E. rewarded him with "demeaning compensation" and "petty treatment." Saddened and hurt by the company he had so admired and aspired to work for from the age of nine, Hall left G.E. and became director of research and professor of chemistry at Brigham Young University.

Hall continued his diamond making research at BYU, but was prevented from using his own Belt device because G.E. owned the patent as a condition of Hall's previous employment. So Hall began

again, and succeeded in designing an entirely different apparatus for making diamonds called the "Tetrahedral Press," which he also patented.

Having thus liberated himself from conceptual dependence on the Belt, Hall was free to pursue a 25-year career in high pressure research at BYU. The H. Tracy Hall Professorship at BYU honors his work.

Karl R. Cannon is a registered patent attorney with the intellectual property law firm of THORPE, NORTH & WESTERN in Sandy. His column appears every two weeks in the Monday edition of The Daily Herald *and is intended as general information only and not as specific legal advice. Questions or comments can be directed to Cannon at (801) 566-6633, or via e-mail at cannon@tnw.com.*

H. Tracy Hall, '70, is retiring from full-time teaching after 26 years at BYU's Chemistry Department. Dr. Hall has been named a distinguished professor emeritus of chemistry, and was the first person to create synthetic diamonds in a laboratory, and became an internationally recognized authority in high pressure research. He recently passed the bar examination on patent law, which enables him to become a patent agent. He holds 17 U.S. and more than 70 foreign patents for his work. He has received many prizes and honors, including the Chemical Pioneer Award from the American Institute of Chemists for 1970 and the American Chemical Society's Award for Creative Invention in 1972. He is married to Ida Rose Langford, '60, and they reside in Provo, UT.

PROFILE JUN 1981

Jan 1965 —

Dr. H. Tracy Hall, native of Ogden, Utah, director of research at BYU, lectured at Yale University in June, giving the third annual Olin Lecture to the Yale [illegible]. He is famous as the person who first produced synthetic diamonds. His research at BYU has gone much further than producing diamonds, resulting in many substances unknown in nature. He is [illegible] in high pressure-high temperature. Together chemists, geologists and physicists are waiting [for] his further research.

25,000 CARATS OF INDUSTRIAL DIAMONDS worth from a25,000 to $50,000 are shown here with Dr. Tracy Hall, left, who made the world's first synthetic diamond, and his son, David. Dr. Hall founded Megadiamonds of Provo 13 years ago, which makes the product. David now manages it. The product is used in grinding wheels, cutting saws and other tools in industry. Today is the 25th anniversary of Dec. 16, 1954, when Dr. Hall made the world's first synthetic diamond in the General Electric Laboratories at Schenactady, N.Y. Two-thirds of the diamonds used today in industry are synthetic. The pile in the picture consists of minute synthetic diamond particles, each about the size of a grain of salt.

Invented by BYU's Tracy Hall

Dec. 16, 1979 Herald

Provo Firm Notes 25th Year Of First Synthetic Diamond

By THERON H. LUKE

Twenty-five years ago today a native Utahn, working in the General Electric Laboratories of Schenectady, N.Y., made the world's first synthetic diamond. It revolutioned the industrial use of the diamond across the globe.

Today that inventor, Dr. H. Tracy Hall of Provo, will probably spend his usual busy Sunday as bishop of a Provo LDS Ward. The company in Provo that he founded to make and market his product, Megadiamond Industries, Inc., located in an inobtrusive building at 275 W. 2230 N., will be closed as usual on Sunday, with no particular ceremonies planned, at least today, to mark the event which changed much of the industrial world where grinding, sawing and polishing of hard surfaces was necessary. It largely replaced the costly natural diamond for this purpose (although synthetic diamonds are by no means cheap) and made possible a more plentiful and less costly supply of material for cutting and polishing tools and other equipment for industry.

Megadiamonds in Provo was launched 13 years ago by Dr. Hall, Duane Horton and Bill J. Pope some 10 years after Dr. Hall was brought to BYU as director of research. He is still on the faculty today with the title of distinguished professor of chemistry.

The second machine which he invented to make synthetic diamonds, because General Electric had the patent on his first one, has been seen by many residents of Utah Valley on display at Brigham Young University.

Megadiamonds is now managed by his son, David. The inventor remains in the firm as a consultant. Unknown to most people, the firm is number two in the United States in the manufacture of synthetic diamonds (General Electric is first) and number three in the world (behind General Electric and DeBeers of London and South Africa). Although it ranks next to G.E. in the U.S., David Hall is quick to point out that G.E.'s production is many times that of Megadiamond.

But Megadiamond makes hundreds of pounds of synthetic diamonds a year, he said, employing about 60 people in it's Provo plant. Today, he noted, over 15 tons of synthetic diamond is manufactured annually and used by industry throughout the world.

How is it made? Without going into detail of a very complicated process, it boils down to tremendous pressure and tremendous controlled temperature. How much of each? The inventor compared it to "200 Washington monuments stacked on top of each other, and temperature as hot as the surface of the sun."

Although General Electric holds the patent on the first machine, several companies make synthetic diamonds today (all with Dr. Hall's machines) and have developed improvements for use of synthetic diamonds in many special applications where the diamond properties are tailored to a specific job.

Diamond Inventor Honored Today

Dr. H. Tracy Hall, the first person to create synthetic diamonds in a laboratory and an internationally recognized authority in the field of high pressure research, is retiring from full time teaching after 26 years at Brigham Young University.

But that doesn't mean he's going to take it easy. In addition to spending half a day in research at BYU and working at Medadiamond, a Provo based company he helped found, Tracy Hall, at 61, has become a patent agent.

Dr. Hall, who has been named a distinguished professor emeritus of chemistry at BYU, is being honored on his retirement at a reception today from 4 to 6 o'clock in 257 Eyring Science Center. The public is invited.

At the reception, Dr. Hall will display patents, papers and photographs of the inventions and research that established him as one of the most important figures ever in the high pressure and temperature field.

But after 30 years of inventing teaching and researching Dr. Hall didn't feel that was enough. Three years ago he bought about $1,500 worth of patent law books and started studying at home. He recently passed the bar exam on patent law which enables him to become a patent agent.

"I have relied on patent lawyers for the past 30 years," Dr. Hall said. "But I found that most successful inventors are also patent agents, so I set out to

H. TRACY HALL

prove that a person is never too old to learn."

Dr. Hall holds 17 U.S. and more than 70 foreign patents for his work.

He says he began studying so he could apply for his own patents, but as a result he has recently landed a contract as a patent agent with a New York law firm. A scientific mind is important in patent law because it can appreciate what an inventor has developed, he said.

Inventing has been one of the hallmarks of Dr. Hall's remarkable career. In 1948, after receiving a Ph.D. in chemistry from the University of Utah and working as a chemist with the U.S. Bureau of Mines office in Salt Lake City, the Ogden native went to work at General Electric as a research chemist.

There he was a member of the team trying to develop the first reproducible method of creating a synthetic diamond.

Although he was hired as a chemist assigned to tackle the structural problems associated with diamond synthesis, Dr. Hall saw a way to design an appartus that would produce the intense pressure and heat needed to turn graphite into diamonds.

The result was the "belt" and in 1954, using the "belt," Dr. Hall became the first person to synthesize diamonds in a way that could be duplicated by others in the laboratory.

A year later, Dr. Hall came to BYU as a professor of chemistry and director of research for the entire university. He said that at BYU he would be able to conduct his research with more freedom.

When he learned a Department Commerce privacy order prevent him from using his own invention conduct high pressure research, D Hall turned around and within tv years had perfected the tetrahedr doing," Dr. Hall said. The Nation High Pressure Data Center was e tablished at BYU. And during th time, Dr. Hall brought in more than million dollars in research funds BYU.

"Dr. Hall has one of the few truly i ternational reputations in the unive sity," said Dr. Rex Goates, dean of t College of Physical and Mathematic Sciences at BYU. "He is known all ov the world."

Dr. Hall continued as director research at BYU for 12 years until 196 when he became the second BY faculty member to earn the title Distinguished Professor.
press, a device which could do all th things the "belt" could do and more.

Using the tetrahedral press to co duct research, Dr. Hall firmly e tablished himself as a world leader i high pressure research, and for yea BYU was the high pressure researc center of the world.

"Starting in 1957 and for 20 years w had scientists from all over the worl coming to BYU to see what we we