

H. TRACY HALL
BIOGRAPHICAL SKETCH

~~January 1979~~ March 1981

Hall, Howard Tracy

Current Address:

1711 No. Lambert Lane, Provo, Utah 84601; Home Phone (801) ³⁷⁴⁻⁰³⁰⁰ ~~373-3323~~; Office, B-41
Brigham Young University, Provo, Utah 84602; Phone (801) ~~374-1211~~, Ext. 4741-
³⁷⁸⁻⁰³⁰⁰

Born:

Ogden, Utah, 20 October 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:

Assoc. Sci. Weber College 1939 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:

1980 ¹⁹⁸⁰ → *Distinguished Professor, emeritus, Brigham Young University, Provo, Utah*
1967, ¹⁹⁶⁷ Distinguished Professor, 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, Utah.
1940-1942, Chemical Analyst, Sperry Flour Mills, Ogden, Utah (part time)
1939-1940, Photographer, Checketts Photo, Ogden, Utah.

Military Service:

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

Miscellaneous:

1953 - *Designer and builder of High Pressure, High Temperature Equipment.*

Honors & Distinctions of H. Tracy Hall

- 1980 Admitted to practice patent law before the U.S. Patent and Trademark office as an agent, registration no. 29,800, June 23.
- 1980 "Man of the Year Award", Abrasive Engineering Society, Milwaukee, Wisconsin
- 1978 "Karl G. Maier Research Award", Brigham Young University, Provo, Utah, August 31
- 1977 "International Prize for New Materials", The American Physical Society, San Diego, California, March 22
- 1975 "Distinguished Alumni Award" Weber State University, Ogden, Utah, October 16
- 1974 "IR-100 Award", Industrial Research Magazine for Indelible Lubricated Diamond Tools, Chicago, October 8.
- 1973 "Engineering Materials Achievement Award", The American Society for Metals, Chicago, IL
-
- 1973 American Chemical Society Tour Speaker (Texas, Louisiana)
- 1973 The American Society for Metals "Engineering Materials Achievement Award", Chicago, Oct. 2, Conrad Hilton Grand Ballroom.
- 1972 American Chemical Society Tour Speaker (Oregon, Washington)
- 1972 Fellow, The American Institute of Chemists
- 1972 The Intermountain Society of Inventors and Designers "Certificate for Distinguished Service and Leadership in the Field of Invention and Designing", Salt Lake City, Utah, May 20
- 1972 Fellow, The Utah Academy of Science, Arts, and Letters
- 1972 The American Chemical Society "Award for Creative Invention", Boston, Mass., April 10
- 1971 Honorary Doctor of Science Degree, Brigham Young University, Commencement Exercises, Provo, Utah, May 28
- 1971 "Outstanding Manhood Award", presented by Associated Men Students, Brigham Young University, Provo, Utah, April 13
- 1970-1973 Member of National Academy of Science--National Research Council Evaluation Panel for the National Bureau of Standards Heat Division
- 1970 Cortez Honors Lecture, Weber State University, Dec 10, Ogden, Utah
- 1970 American Institute of Chemist's "Chemical Pioneer Award", Pittsburgh, Pennsylvania, May 16
- 1968- Member of Joint Army-Navy-Air Force Thermochemical Tables Advisory Group
- 1967- Distinguished Professor of Chemistry and Chemical Engineering, Brigham Young University
- 1967 Robert A. Welch Foundation, "Lecturer in Chemistry", Texas Universities
- 1966-1969 Member of Editorial Board, "The Review of Scientific Instruments"
- 1965 The American Chemical Society, Salt Lake Section's "Utah Award", University of Utah, Salt Lake City, December 9
- 1965 The National Association of Manufacturer's "Modern Pioneers in Creative Industry Award", The Waldorf Astoria, New York City, December 2
- 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, Connecticut, 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". New York City
- 1961-1964 Member of Editorial Board, "Inorganic Chemistry"
- 1960-1961 President, Utah Academy of Sciences, Arts and Letters
- 1960 Fellow, American Association for the Advancement of Science
- 1959-1963 Alfred P. Sloan Foundation Research Fellow
- 1959 Chairman, Salt Lake Section, American Chemical Society
- 1954 First to synthesize diamond, December 16, ~~1954~~, G.E. Research Lab, Schenectady, N.Y.

as of Dec 1973

Publications - 76 in number

patents - 57 in number

outside research grants received during 18 years at BYU = 44 and exceeds one million dollars

Professional Society Membership:

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, Utah Academy of Science, Arts and Letters, Newcomen Society in North America.

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." (100,000 + atmospheres, simultaneously with 2000 + Degrees 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).
9. Sintered Diamond (similar to natural carbonado type diamond) (1970). The bonding together of fine diamond particles to produce a dense, strong, polycrystalline body of desired shape having properties equal to or exceeding those of natural carbonado heralds a new era in diamond technology. This new material is already finding use in wheel dressers, wire drawing dies, drilling stones, cutting tools, and in electronics. Thin disks, cylinders with axial holes, nozzles, rings, spheres, cubes and other molded shapes up to 20 carat size are currently possible and will certainly revolutionize the diamond industry in the next decade. In addition, this discovery just about takes care of the problem of strategic diamond materials. In industrial diamonds, the United States will soon approach self sufficiency.

Other Responsibilities:

Director of Brigham Young University High Pressure Laboratory, 1955---

Director of the National High Pressure Data Center which is run by Brigham Young University for the U. S. National Bureau of Standards, 1965---

PUBLICATIONS OF H. TRACY HALL

1. Graham W. Marks and H. Tracy Hall, "A Method for the Spectrochemical Determination of Germanium, Tin and Lead in Ore Samples," U. S. Bureau of Mines Report of Investigations No. R.I. 3965, Nov. 1946, 38 pp.
2. H. Tracy Hall and Henry Eyring, "The Constitution of Chromic Salts in Aqueous Solution," J. Am. Chem. Soc., 72, 782-790 (1950).
3. Graham W. Marks and H. Tracy Hall, "Transmission Characteristics in the Visible Spectral Region of the Quinalizarin and Beryllium - Quinalizarin Complex in N/4 Sodium Hydroxide Solution," U. S. Bureau of Mines Report of Investigations No. 4741, Oct. 1950, 5 pp.
4. H. Tracy Hall and Raymond M. Fuoss, "Empirical Analysis of Viscosity Data," J. Am. Chem. Soc., 73, 265-269 (1951).
5. H. Tracy Hall, "Molecular Weight of Polytrifluorochloroethylene by Light Scattering," J. Polymer. Sci., 7, 443-447 (1951).
6. H. Tracy Hall, Edward L. Brady and Paul D. Zeman, "Viscosity of Polytrifluorochloroethylene in O-Chlorobenzotrifluoride," J. Am. Chem. Soc., 73, 5460 (1951).
7. H. Tracy Hall, "The Solubility of Polytrifluorochloroethylene," J. Am. Chem. Soc., 74, 68-71 (1952).
8. H. Tracy Hall, "A New Method of Mounting Diamonds," Rev. Sci. Instrum., 25, 1035-1036 (1954).
9. F. P. Bundy, H. T. Hall, H. M. Strong and R. H. Wentorf, "Man-Made Diamonds," Nature, 176, 51-54 (1955).
10. H. Tracy Hall, "The Melting Point of Germanium as a Function of Pressure to 180,000 Atmospheres," J. Phys. Chem., 59, 1144-1146 (1955).
11. H. Tracy Hall, "Chemistry at High Temperature and High Pressure," Research and Engineering, 11, 27-28 (1956).
12. H. Tracy Hall, "Chemistry at High Temperature and High Pressure," High Temperature--A Tool for the Future, Stanford Research Institute, Menlo Park, California, 161-166 (1956).
13. H. Tracy Hall, "What the Sunday School has Done for Me," The Instructor, 91, 341 (1956).
14. H. Tracy Hall, "Chemistry at High Pressures and High Temperatures," J. Wash. Acad. Sci., 47, 300-304 (1957).
15. H. Tracy Hall, Billings Brown, Bruce Nelson and Lane A. Compton, "I. An Apparatus for Use with Condensed Phases at 10,000 Deg. II. Some Thermodynamic Considerations at Very High Temperatures," J. Phys. Chem., 62, 346-351 (1958).
16. H. Tracy Hall, "Some High Pressure, High Temperature Apparatus Design Considerations: Equipment for Use at 100,000 Atmospheres and 3000 Deg. C," Rev. Sci. Instrum., 29, 267-275 (1958).

17. H. Tracy Hall, "Ultrahigh Pressure Research," *Science*, 128, 445-449 (1958).
18. H. Tracy Hall and S. S. Kistler, "High Pressure Developments," Annual Review of Physical Chemistry, Annual Reviews, Inc., Palo Alto, California, 395-416 (1958).
19. H. Tracy Hall, "Diamonds," Proceedings of the Third Conference on Carbon (held at University of Buffalo, Buffalo, N. Y., June 1957), Pergamon Press, London, pp. 75-84.
20. H. Tracy Hall, "Ultrahigh Pressures," *Sci. American*, 201, 61-67 (1959).
21. H. Tracy Hall, "High Pressure Methods," Proceedings of an International Symposium on High Temperature Technology, Asilomar Conference Grounds, California, Oct. 6-9, 1959; Arranged by Stanford Research Institute, Menlo Park, California, McGraw-Hill, New York, pp. 145-156 and 335-336 (1960).
22. H. Tracy Hall, "Ultrahigh Pressure, High Temperature Apparatus: The Belt," *Rev. Sci. Instrum.*, 31, 125-131 (1960).
23. H. P. Bovenkerk, F. P. Bundy, H. T. Hall, H. M. Strong, and R. H. Wentorf, Jr., "The Preparation of Diamond," *Nature*, 184, 1094-1098 (1959).
24. J. Duane Dudley and H. Tracy Hall, "Experimental Fusion Curves of Indium and Tin to 105,000 Atmospheres," *Phys. Rev.*, 118, 1211-1216 (1960).
25. H. T. Hall, "Some High Pressure, High Temperature Apparatus Design Considerations: Equipment for use at 100,000 Atmospheres and 3000°C," Series of Selected Papers in Physics, Solid State Physics in High Pressure, The Physical Society of Japan, Dept. of Physics, University of Tokyo, Japan (1960), pp. 6-14, Reprinted from *Rev. Sci. Instrum.*, 29, 267-275 (1958).
26. H. Tracy Hall, "High Pressure Apparatus," Progress in Very High Pressure Research, Proceedings of an International Conference Held at Bolton Landing, New York, June 13-14, 1960, edited by Bundy, Hibbard, and Strong (John Wiley and Sons, Inc., Publishers), pp. 1-9 (1961).
27. H. Tracy Hall, "Possible Future Roles of the Utah Academy," Presidential Address, Proceedings, Utah Academy of Sciences, Arts and Letters, 38, 8-10 (1961).
28. H. Tracy Hall, "The Synthesis of Diamond," *J. Chem. Educ.*, 38, 484-489 (1961).
29. H. Tracy Hall, "Anvil Guide Device for Multiple-Anvil High Pressure Apparatus," *Rev. Sci. Instrum.*, 33, 1278-1280 (1962).
30. H. Tracy Hall, J. Dean Barnett and Leo Merrill, "Ytterbium: Transition at High Pressure from Face-Centered Cubic to Body-Centered Cubic Structure," *Science*, 139, 111-112 (1963).
31. H. Tracy Hall and Leo Merrill, "Some High Pressure Studies on Ytterbium," *Inorg. Chem.*, 2, 618-624 (1963).

32. H. Tracy Hall, "High Pressure, High Temperature," pp. 730-738, *Perspectives in Materials Research*, edited by L. Hinnel, J. J. Harwood, and W. J. Harris, Jr., Office of Naval Research, Dept. of the Navy, Washington, D. C., *Surveys of Naval Science*, No. 10, February 1963. (Note: This material was written four years before the book was published).
33. J. Dean Barnett, Roy B. Bennion, H. Tracy Hall, "High Pressure X-ray Diffraction Studies on Barium," *Science*, 141, 534-535 (1963).
34. H. T. Hall, "High Pressure Apparatus," in *The Physics of High Pressures*, edited by K. Swenson, (in Russian) published in Moscow (1963). This paper translated from my paper presented at the International High Pressure Conference held at Bolton Landing, New York, June 13-14, 1960.
35. J. Dean Barnett, Roy B. Bennion, H. Tracy Hall, "X-ray Diffraction Studies on Tin at High Pressure and High Temperature," *Science*, 141, 1041-2 (1963).
36. Donald R. Hall and H. Tracy Hall, "Missionary Diary of Helon Henry Tracy in the United States and Great Britain 1881-1882," private publication, 158 pp., 300 copies printed (1963).
37. H. Tracy Hall, "High Pressure/Temperature Apparatus," chapter 4 (pp. 133-179), *Metallurgy at High Pressures and High Temperatures*, edited by K. A. Gschneidner, Jr., M. T. Hepworth, and N. A. D. Parlee; Gordon and Breach Science Publishers, New York, 1964.
38. J. Dean Barnett and H. Tracy Hall, "High Pressure-High Temperature X-ray Diffraction Apparatus," *Rev. Sci. Instrum.*, 35, 175-182 (1964).
39. H. T. Hall, "Polymorphism and High Pressure," *B. Y. U. Studies*, 5, 139-153 (1964).
40. H. T. Hall, Guest Editorial, "High Pressure," *Experimental Mechanics*, 4, 3-A (1964).
41. H. T. Hall, L. Merrill and J. D. Barnett, "High Pressure Polymorphism in Cesium," *Science*, 146, 1297-1299 (1964).
42. H. T. Hall, "High Pressure Chemistry," in *Progress in Inorganic Chemistry*, Vol. 7, edited by F. A. Cotton, Interscience Publishers, pp. 1-38 (1966).
43. H. T. Hall, "Periodic Compounds: Syntheses at High Pressures and Temperatures," *Science*, 148, 1331-1333 (1965).
44. H. T. Hall and L. A. Compton, "Group IV Analogs and High Pressure, Temperature Synthesis of B₂O," *Inorg. Chem.*, 4, 1213-1216 (1965).
45. W. E. Evenson and H. T. Hall, "Volume Measurements on Chromium to 30 kilobars," *Science*, 150, 1164-1165 (1965).
46. J. D. Barnett, V. E. Bean, and H. T. Hall, "X-ray Diffraction Studies on Tin to 100 Kilobars," *Journal of Applied Physics*, 37, 875-877 (1966).
47. R. N. Jeffery, J. D. Barnett, H. Vanfleet, H. T. Hall, "A Pressure Scale to 100 Kilobar Based on Compression of Sodium Chloride," *J. Appl. Phys.*, 37, 3172-3180 (1966).

48. H. T. Hall, "Hydraulic Ram Design for Modern High Pressure Devices," *Rev. Sci. Instrum.*, 37, 568-571 (1966).
49. H. T. Hall, "A Tetrahedron Problem," *Math. Mag.*, 38, 241 (1965).
prob. No. 598.
50. H. T. Hall, "A Scientist Looks at the Miracles of Jesus," *The Instructor*, 101, 86-87 (1966).
51. H. T. Hall, "Transformations in Solids at High Pressure," Proceedings of Fourth Meeting, Cape Kennedy, Florida, March 16-18, 1966, Thermochemistry Working Group, Interagency Chemical Rocket Propulsion Group, Chemical Propulsion Information Agency, Publication No. 108, June 1966, Volume 1, pp. 67-74.
52. H. T. Hall, "High Temperatures, High Pressures, and Periodic Compounds," High-Temperature Chemistry, National Academy of Sciences, National Research Council Publication 1470, Washington, D. C., 1967, pp. 65-66.
53. H. T. Hall (Book), "High Pressures (to 100,000 Atmospheres at 1500 Deg. C)," American Institute of Chemical Engineers, Today Series, 345 West 47th St., New York, N. Y. 10017, (1967), 179 pp.
54. H. T. Hall, "High Pressure Apparatus: Ram-In-Tie-Bar Multianvil Presses," *Rev. Phys. Chem. Japan*, 37, 63-71 (1967).
55. R. B. Bennion, H. G. Miller, W. R. Myers, H. T. Hall, "100 Kbar Press for Time-of-Flight Neutron Diffraction," *Acta Cryst.*, 25A, S71 (1969).
56. N. L. Eatough and H. T. Hall, "High Pressure Synthesis of Rare Earth Diantimonides," *Inorg. Chem.*, 8, 1439 (1969).
57. N. L. Eatough, Alan W. Webb, and H. T. Hall, "High Pressure Th_3P_4 -Type Polymorphs of Rare Earth Sesquichalcogenides," *Inorg. Chem.*, 8, 2069-2071 (1969).
58. J. D. Barnett, J. Pack, and H. T. Hall, "Structure Determination of a Ferroelectric Phase of Sodium Nitrate Above 45 Kilobar," Proceedings of the Symposium on Crystal Structure at High Pressure at Pacific Science Center, Seattle, Washington, March 24, 1969, Transactions of the American Crystallographic Association, 5, 113-131 (1969), Available from Polycrystal Book Service, P. O. Box 11567, Pittsburg, Pennsylvania 15238.
59. N. L. Eatough and H. T. Hall, "High Pressure Synthesis of Lutetium Diantimonide," *Inorg. Chem.*, 9, 416-417 (1970).
60. N. L. Eatough and H. T. Hall, "High Pressure Th_3P_4 -Type Polymorphs of Rare Earth Sesquiselenides," *Inorg. Chem.*, 9, 417-418 (1970).
61. A. W. Webb and H. T. Hall, "High Pressure Synthesis of Rare Earth Polyselenides," *Inorg. Chem.*, 9, 843-847 (1970).
62. A. W. Webb and H. T. Hall, "High Pressure Synthesis of Rare Earth Polysulfides," *Inorg. Chem.*, 9, 1084 (1970).
63. H. T. Hall, "High Pressure Synthesis Involving Rare Earths," *Rev. Phys. Chem. Japan*, 39, 110-116 (1969).

64. J. F. Cannon and H. T. Hall, "High Pressure Synthesis of Selected Lanthanide-Tellurium Compounds," *Inorg. Chem.*, 9, 1639-43 (1970).
65. H. T. Hall, "Personal Experiences in High Pressure," *The Chemist*, 47, 276-79 (1970).
66. H. T. Hall, "Sintered Diamond: A Synthetic Carbonado," *Science*, 169, 868-69 (1970).
67. H. T. Hall, "The Synthesis of Diamond," in Advances in Chemical Physics, Vol. XXI, entitled, "Chemical Dynamics," (papers in honor of Henry Eyring), Eds. Hirschfelder and Henderson, John Wiley, New York (1971), pp. 721-35.
68. H. T. Hall, "High Pressure Scale by X-ray Diffraction Techniques up to Approximately 100 kbar," in Accurate Characterization of the High-Pressure Environment, Ed. E. C. Lloyd, U. S. Dept. of Commerce, National Bureau of Standards Special Publication 326, pp. 303-06 (U. S. Government Printing Office, Washington, D. C. 20402; Catalog No. C 13.10:326).
69. H. T. Hall, "Fixed Points Near Room Temperature," in Accurate Characterization of the High-Pressure Environment, Ed. E. C. Lloyd, U. S. Dept. of Commerce, National Bureau of Standards Special Publication 326, pp. 313-14 (U. S. Government Printing Office, Washington, D. C. 20402; Catalog No. C 13.10:326).
70. F. William Linsley, Jr., Jerald S. Bradshaw and H. Tracy Hall, "High Pressure Affects on Conjugated Aromatic Compounds," *Rev. Phys. Chem. Japan*, 40, 69-72 (1970).
71. D. L. Decker, W. A. Bassett, L. Merrill, H. T. Hall and J. D. Barnett, "High Pressure Calibration: A Critical Review," *J. Phys. Chem. Ref. Data*, 1, 773-836 (1972).
72. K. A. Miller and H. T. Hall, "High Pressure Synthesis of Rare Earth Tri-Tin Compounds," *Inorg. Chem.*, 11, 1188-91 (1972).
73. J. F. Cannon, D. L. Robertson and H. T. Hall, "Synthesis of Lanthanide-Iron Laves Phases at High Pressures and Temperatures," *Mater. Res. Bull.*, 7, 5-12 (1972).
74. N. L. Eatough and H. T. Hall, "High Pressure Synthesis of $REMn_2$ Compounds with the $MgZn_2$ (Laves) Structure," *Inorg. Chem.*, 11, 2608-09 (1972).
75. J. F. Cannon, D. L. Robertson and H. T. Hall, "The Effect of High Pressure on the Formation of LRu_2 and LOs_2 (L = Lanthanide) Compounds," *J. Less-Common Metals*, 29, 141-46 (1972).
76. D. L. Robertson, J. F. Cannon and H. T. Hall, "High Pressure and High Temperature Synthesis of $LaCo_2$," *Mater. Res. Bull.*, 7, 977-81 (1972).
77. J. M. Leger and H. Tracy Hall, "Pressure and Temperature Formation of A_3B Compounds. I. Nb_3Si and V_3Al ," *J. Less-Common Metals*, 32, 181-87 (1973).
78. J. M. Leger and H. Tracy Hall, "Pressure and Temperature Formation of A_3B Compounds. II. Nb_3Ge , Nb_3Sn , Nb_3Pb ," *J. Less-Common Metals*, 34, 17-24 (1974).

79. Karl A. Miller and H. Tracy Hall, "High-Pressure Synthesis of Lutetium Trilead," *J. Less-Common Metals*, 32, 275-78 (1973).
80. J. F. Cannon, D. L. Robertson, H. T. Hall and A. C. Lawson, "The Effect of High Pressure on the Crystal Structure of LaOs_2 and CeOs_2 ," *J. Less-Common Metals*, 31, 174 (1973).
81. A. C. Lawson, J. F. Cannon, D. L. Robertson and H. T. Hall, "Superconductivity of LaOs_2 ," *J. Less-Common Metals*, 32, 173-74 (1973).
82. J. F. Cannon, D. L. Robertson, H. T. Hall and A. C. Lawson, "High Pressure Synthesis of Beta-W-Type Nb_3Te ," *J. Phys. Chem. Solids*, 35, 1181-82 (1974).
83. M. D. Horton, B. J. Pope and H. T. Hall, "Sintered Diamond," International Industrial Diamond Association Symposium, Washington, D. C. (1974).
84. B. J. Pope, M. D. Horton, H. T. Hall, L. S. Bowman and H. Adaniya, "Sintered Diamond: Its Possible Use as a High Thermal Conductivity Semiconduction Device Substrate," Proc. 4th International Conference on High Pressure (AIRAPT), Kyoto, Japan (1974).
85. B. J. Pope, M. D. Horton, H. T. Hall and S. DiVita, "Selection and Treatment of Diamond Particulates in Preparation for High Thermal Conductivity Ceramics by Sintering at High Temperature and Ultra-high Pressure," Proc. Ninth Annual University Conference on Ceramic Science of the American Ceramic Society, Orlando, Florida (1975).
86. J. F. Cannon and H. T. Hall, "Effect of High Pressure on the Crystal Structures of Lanthanide Trialuminides," *J. Less-Common Metals*, 40, 313-28 (1975).
87. H. Tracy Hall, "Retraction System for Multi-anvil Presses," *Rev. Sci. Instrum.*, 46, 436-38 (1975).
88. H. Tracy Hall, "Sintered Diamond", *Brigham Young University Studies*, 16, 43-47 (1975) [Special Centennial Issue]
89. J. F. Cannon, D. M. Cannon, and H. T. Hall, "High Pressure Synthesis of SmB_2 and GdB_2 ", *J. Less common Metals* 56, 83-90, (1977)
90. J. F. Cannon H. T. Hall, "High Pressure Synthesis of Lanthanide/Boron and Actinide/Boron Compounds", in *Rare Earths in Modern Science and Technology, 1978*, pp. 219-225 edited by D. F. McCarthy and J. F. Rhyne, Plenum Press, New York & London (1978) pp 219 - 224
- H.T.Hall 91. Chapter I, "Introduction" to *Chemical Experimentation Under Extreme Conditions*, *Techniques of Chemistry*, Vol. IX, Eds A Weissberger and B. Rosseter, John Wiley & Sons (1980) pp 1-8.
- H.T.Hall 92. Chapter II, "High Pressure Techniques", *ibid.* pp. 9-72.
93. H. Tracy Hall "This Week's Citation Classic", *Current Contents*, ISI Press, 41, 14 (1980)

7. U. S. 2,947,608, August 2, 1960. "Diamond Synthesis"
 Assignee: General Electric Company
 Foreign Patents and Numbers:
- | | |
|------------|-----------|
| Argentina | 122,721 |
| Austria | 223,173 |
| Belgium | 582,481 |
| Canada | 638,043 |
| England | 840,770 |
| France | 1,243,888 |
| India | 68,989 |
| Italy | 615,336 |
| Japan | 302,022 |
| Luxembourg | 37,663 |
| Norway | 97,992 |
8. U. S. 2,944,289, July 12, 1960 "Reaction Vessel"
 Assignee: General Electric Company
9. U. S. 3,158,442, November 24, 1964.
 "Method of Making High Compressive Strength Silicon Carbide and the Product Thereof."
 Assignee: Research Corporation
10. U. S. 3,159,876, December 8, 1964. "High Pressure Press"
 Assignee: Research Corporation
11. U. S. 3,182,353, May 11, 1965. "Guide Means for High Pressure Press"
 Assignee: Research Corporation
12. U. S. 3,249,753, May 3, 1966. "High Pressure-High Temperature X-Ray Diffraction Apparatus," with J. Dean Barnett.
 Assignee: None
13. U. S. 3,440,687, April 29, 1969. "Multianvil Press"
 Assignee: None
 Foreign Patents and Numbers: South Africa 67/1656
14. U. S. 3,816,085, June 11, 1974. Diamond-Nondiamond Carbon Polycrystalline Composites.
 Assignee: Megadiamond Corporation *also corresponding foreign patents*
15. U. S. 3,829,544, August 13, 1974. Method of Making a Unitary Polycrystalline Diamond Composite and Diamond Composite Produced Thereby.
 Assignee: Megadiamond Corporation *also corresponding foreign patents*
16. U.S. 4,104,344, August 1, 1978, High Thermal Conductivity Substrate
 (with B. J. Pipe and M. Duane Horton)
 assignee: Brigham Young University
17. U.S. 4,163,769, August 7, 1979, High Thermal Conductivity Substrate
 (with B. J. Pipe and M. Duane Horton)
 assignee: Brigham Young University)