

BRIEF SYNOPSIS OF RESEARCH CONDUCTED BY H. TRACY HALL
AT BRIGHAM YOUNG UNIVERSITY
FROM SEPTEMBER OF 1955 THROUGH JULY OF 1974

Since the Belt' apparatus developed by Dr. Hall at the General Electric Company for obtaining very high pressures simultaneously with high temperatures was held secret and proprietary by that company, it became necessary that new equipment be invented, in order to pursue research at BYU. The new devices invented at BYU are known, in general, as multi-anvil presses, the first of which was the tetrahedral press. Dr. Hall has continued to improve this and related devices down to the present time. His apparatus inventions are in use throughout the world, and it must be said that high-pressure, high-temperature research spread to the rest of the world from BYU.

It has been Dr. Hall's desire to involve as many BYU scientists as possible in this new discipline. Consequently, he took many faculty members "under his wing", providing funds, equipment, instruction, and encouragement. BYU faculty members who have been involved in high pressure research include: Drs. J. Dean Barnett, Daniel L. Decker, Howard B. Van Fleet, Leo Merrill, John F. Cannon, Norman L. Eatough, M. Duane Horton, Bill J. Pope, Billings Brown, William Evenson, Myron Best, Lane A. Compton, John H. Gardner, H. Mark Nelson, F. Kent Nielson, John C. Clegg, Lawrence Bowman, Leo P. Vernon, R. Chase Allred, J. Rex Goates, J. Bevan Ott, and J. Duane Dudley.

Perhaps Dr. Hall's greatest research interest is in trying to synthesize, by high pressure and high temperature means, new chemical compounds. He and his associates have managed to create about eighty new

substances that did not exist before. At present, they are only of scientific interest, but may have potential practical value, because of their electromagnetic properties.

In addition to the synthesis work, Dr. Hall has studied the way in which the melting point of substances changes with pressure, the effect of pressure on such things as electrical conductivity, atom size, and atomic arrangement.

In early 1966, Drs. Bill J. Pope and M. Duane Horton approached Dr. Hall with the idea that it would be a good thing to establish a commercial venture in Provo, wherein the new science of very high pressure combined with very high temperatures might be utilized. Subsequently, on April 6, 1966, a new company named Mega Pressure Products and Research Corporation was incorporated in the state of Utah. This company acquired land, constructed a building, and also the world's largest cubic press. It then set about to discover something of significance to manufacture. That company (now named Megadiamond Corporation) now sells, on a worldwide basis, a diamond product which has the trade name of "Megadiamond". The Megadiamond product is currently used primarily as a cutting tool for very hard materials. It is made of very fine diamond powder, fine as face powder, that is placed in a graphite mold and simultaneously subjected to approximately 1 million pounds per square inch at temperatures beyond 2000°C. Under these unbelievable conditions, the diamond particles fuse together to form any desired shape. While Brigham Young University has no direct involvement with Megadiamond Corporation, President Wilkinson and other leaders encouraged the company's formation. Because of the university's interest in the patents on Dr. Hall's high pressure apparatus,

however, the university derives royalties from Megadiamond sales.

While Dr. Hall's synthesis of Megadiamond has received world-wide attention, it will have to take second place to his initial startling achievement^—the synthesis of diamond from graphite, a feat that had eluded scientists for over 175 years. This synthesis occurred December 16, 1954, in Schenectady, New York, approximately eight months prior to Dr. Hall's appointment as Brigham Young University's Director of Research.