Synthetic diamond

I would like to show the milestones that were laid in the search to make synthetic diamond.

This had been pursued for centuries, but Percy Bridgman really started a systematic research before second W.W., in order to develop equipment able to reach and sustain the required pressure. In spite of his tremendous job, he did not succeed in making diamond, neither alone nor with the associated teams of researchers of General Electric, Norton and Carborundum. Nevertheless, he received the Nobel Prize in 1946.

Up to 1950, all the approaches to diamond making had failed.

Two major problems (each involving many others) remained to be solved :

1. find an even better device for obtaining and sustaining ultra high pressures and temperatures;

2. solve complex chemical problems, because direct conversion of graphite into diamond did not seem to work.

In 1953, Loring Coes was able to make a high pressure polymorph of silica (later called coesite), which was discovered in meteor craters years later (other new materials not existing as such in nature would later be synthesized).

In 1954, just before Christmas, H. Tracy Hall, working at General Electric's laboratory at Schenectady, succeeded the first, long-waited for, synthetic diamonds.

This success stimulated the excitement of the scientific world. Indeed, these people were changing the world : totally new branches of physics, chemistry and geology could be foreseen. Man could make new materials that did not exist in nature, and/or change their properties.

From a purely scientific point of view, it was most interesting to study the properties of matter under high pressure. More than a hundred labs were devoted to high pressure and temperature research in the world.

I remember the admiration for the Belt invented by Tracy, as described in a General Electric-held patent, when the secrecy order was lifted, as well as for the tetrahedral and cubic presses he invented later.

I would also like to say that Henry Dyer - head of the Diamond Research Laboratory at that time, later managing director of De Beers Industrial Diamond - had a very high esteem for these inventions.

When I was working in his laboratory at B.Y.U. in 1961-1962, Tracy told me he had long dreamed to work for General Electric, that brain-child of his much admired Thomas Edison. I like to add that Tracy himself is among those scientists who play the same role towards the next generation of scientists.

Enthusiasm raised by such inventions is a light which is passed on from one man to the next, as is the torch of the Olympic games.

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