

Brussels, 20 August, 1996.

*Dear Broey and dear Jola-Rose,*

I would like to add my testimony to others concerning Tracy's contribution to the synthesis of diamond. It will mainly cover a period of 6 months spent at Provo in 1961-62, as well as a few days in May/June '96.

Let me first explain the reason of our previous stay.

Dr. H. LAMBOT, former professor of Physics at the Brussels University where I had worked with him (and gave the course of Physics for 1 semester when he left) hired me at Diamant Boart, starting 1 May, 1961.

This company which manufactures diamond tools (saws, wheels, bits etc) was the 2nd biggest in the world in its field, after the U.S.Norton. It was facing 2 problems at that time :

1. Some Norton wheels containing synthetic diamond had appeared on the market in 1960. The diamonds were made and sold by G.E., the only company in the world able to manufacture synthetic diamond (and which held the patent). These wheels were working better than those containing natural diamond and it was obvious they could even be improved further in the months to come. Diamant Boart had not been contacted by G.E. and feared very much to be cut from such a valuable material. Being a 100% subsidiary of Sibeka (at the time called Beceka) which, in its turn has strong financial and friendly links with the natural diamond supplier De Beers, it was afraid not to be supplied synthetic diamond by G.E. the new competitor of De Beers.

2. Diamant Boart had a large inventory of diamond fines (several million carats) for which it could find no use except if agglomerated as polycrystalline diamond. This inventory arose from the crushing of rough boart, procedure that left around 15-20% fines. As G.E. was selling synthetic diamond in the sizes required by their customers, De Beers felt they had to compete on this matter and started then to sell their grits ready for use (thanks to arrival of synthetics diamond).

I suggested that the agglomeration of the amassed fines should be done in approximately the same conditions which were required to synthesize diamond, i.e. ultra high pressure/temperature.

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These were 2 serious reasons to get acquainted with this new technology. To accomplish this, the best was to work some time in a U.S. lab. working in this field. We had heard that a scientist whose contribution to the invention of synthetic diamond had been determinant at G.E.'s Schenectady Research Laboratory had since left and was now working in the Mormon University BYU, situated at Provo, Utah. An agreement was pretty soon settled with him and I was expected at Provo on 1 October, 1961. Christiane could give her thesis director a copy of her writing - as she had finished the experimental part - and we left for NYC on 1 September.

As far as we knew, 2 equipments only could reach the pressure and temperature required. The first was the Belt; the second, the tetrahedral (or cubic), both invented by H. Tracy Hall who held himself the patent for the 2nd series of presses.

Tracy had indeed left G.E. for BYU with the assurance from admin. people in Washington that he would be permitted to use the Belt he had invented for research work. Yet, he was warned later by G.E. that he was forbidden to do so. Tracy published a passionate though withholding report on this part of his life and told us recently that he hadn't slept too much during all these years...

Then, what ?

One of these government people told him :

"Hall, why don't you invent a brand new equipment ?"

Invent a completely different equipment which would not infringe the patent now held by G.E. ?... Easy to say... When you "work" in an office in Washington, it is indeed easy to say. But Tracy had no choice, and... unbelievable, yes, he succeeded in inventing a completely different equipment, (and even 2 : tetrahedral and cubic), but how to be sure that it does not fall within the realm of the Belt he had invented earlier ? Tracy inquired, but who would tell him ?... He finally realized that nobody could.

He was probably the best expert in this matter but what if he was not followed in his views, if he would face a case in justice ? Infringement might cost as much as 2 years prison + a severe fine.

I am dreaming...

Had he been imprisoned with nothing else to do... he might have been freed with a brand new project for a 3rd series of presses... who knows ?



Too bad for the UHP technology : history decided otherwise, Tracy was allowed to use his new equipment and I was fortunately allowed to work with him at BYU. He gave ESCO, a company situated in NYC the right to manufacture the tetrahedral and cubic presses and this is why Dr Lambot, Christiane and myself spent some time on the East Coast. Yet, this company had changed several features and the users we visited were not very satisfied: there were anvils alignment problems, too much breakage, the pressure reached was not high enough, the price was much too high... I haste to add that all the people visited were sure that Tracy was not involved in the engineering of this equipment as he was unanimously considered as very competent and a perfectly honest man.

We thus arrived at SLC on Saturday night 30 September '61. We listened to the Mormon Tabernacle Choir on Sunday morning and arrived at Provo in the afternoon by Greyhound. The place was superb - as we had been told - and we felt so happy to stay in such a nice place while learning about the diamond synthetis and the UHP technology. We spent the night at the old Robert's hotel and had dinner at Sutton's Cafe. We met Tracy on the Monday morning at BYU, in his office. The contact was excellent and we were delighted - and surprised, as this would not occur in Europe -to be offered his car to carry the necessary equipment to our flat situated 319E 100N. I received an office giving to his own, Rm 224, ELB (Engineering bld, now down).

People had told me about Tracy : "He is a nice man but he talks very little". It was true but he said exactly what was required and you were not flooded in a sea of words, which was much more efficient.

Before writing this small testimony, I have looked at the reports I wrote at that time and I am struck by the pedagogic talent with which Tracy taught me, starting with the simple piston and cylinder, showing why and where it would fail, going on to the various modifications that had been tried (a part of which I was able to use), the supported piston, the stepped piston, a simplified version of the Belt and, of course the prototype tetrahedral press and, finally, the new XR one which was just achieved in early '62. Tracy showed me also how to calibrate the pressure within the cell etc.

Tracy invited us to his home from time to time and we met Ida-Rose and the children. At that time, you could not see Ida-Rose without Nancy who was 3 and had a baby now, as we were back from our tour, on 8 June, 1996).

We also invited you both for dinner in our flat or, as I remember, to a Chinese restaurant. We had a second hand Rambler and we loved to see the country over the week ends and holidays. Oh, we were already convinced that Utah/Arizona were the most beautiful places on earth, which we confirmed with pleasure in May/June '96.

You never tried to convert us to your religion - which we found nice - although you were bishop at that time. We remember that our postman was full of respect for you, Tracy, as he was in your ward.

Finally, I would like to again write to you - as you may include this letter in your collection of testimonies for your 50 years marriage - what I wrote on June '96 when we were just back from our marvellous souvenir trip :

It was so nice to see you again after nearly 35 years and we were very happy to find you well and quiet. It was good to talk of that "good old time", when the VMP technology was booming, opening new fields in physics, chemistry and geology -

I have been lucky enough to work with you in 1961-'62 and would like to thank you heartedly again for all the care you took to teach me well.

I wouldn't like to forget Jola-Boze in our thanks, as she took care of us so kindly while we were staying with you in Bay lot. I enjoyed very much reading your book on your genealogy. Do not forget to let us know if you intend to visit Europe some time.

Best regards and best wishes to you.

Sincerely

Jay

Cherubine