Duane Horton Interview

J: Were all three of those entities still formed when Tracy gave up his shares to David?

D: Tracy didn't give up any shares to David, or at least a very small amount. In the business, originally Tracy had 51% of the entity. And sometime later, he said for tax purposes, and he said for other reasons to other people, I'm not sure what the reason was, but anyway, he decided he would have a more advantageous tax position if he dropped back to owning less than 25% of the company (1:36) And so he turned about 26% of his ownership back to the treasury not realizing that this made him owner of 33% of the outstanding stock. And so he gave up control of the corporation without achieving his tax objective. But anyway, he dropped back to one-third ownership. (2:00)

After we formed the first entity, Bill and I were novices. We knew nothing about high pressure. Tracy was the man. And I expected that Tracy would carry the brunt of the leadership and teach Bill and I as fast as he could so he could shed responsibility to us. But after a fairly short time, maybe a year, maybe two, Tracy, I guess, felt discouraged with the business. He never really commented. I didn't interpret by his actions just what went on, but he got discouraged. During this early part, we had designed our first production press. It was a big 1200-ton press. We had it built by McCartney Manufacturing in Kansas. And he looked after the construction of the press, looked after it until it was brought back and set up in our building, and at that point, he essentially walked away from it. (3:18)

I was taking the lead in operating the press. By that time I had operated some of the small presses that were on campus. I knew a little bit about it, not a lot. We had something like a dozen anvils, which is the key component that delivers the high pressure in the press. And I ran a calibration, ran the (3:49) business transition, which is about 25 kilobars, whereas to produce diamonds, which was our objective, you needed over 55 or 60. (3:58) So I ran the business transition worked fine. I then tried to run the barium transition, which is 55 kilobars, and got somewhere up near there, and all six anvils crunched, which was half of our inventory. I talked to Bill and Tracy about it, and neither of them had much to say except that may this was an accident. Better try it again, so I tried with the other six, and they crunched.

J: Do you remember about what year this was?

D: (4:35) Probably 1968-69. I anticipated that Tracy would step in and bring his expertise to the forefront, and solve this problem. That was only one of our problems. One was that we couldn't deliver the pressure, the other was we were out of money. Bill rounded up an investor, Dick Stratford. He provided money to do more (5:07)???, but there was not much purpose in doing it the same as it was. And Tracy had since, for whatever reason, he lost interest in solving the problems, so it was up to me ultimately. I talked to other people on campus. Really, in their own way, they solved the problem, I didn't. The design was overoptimistically way under-designed to be able to tolerate pressure. (5:39)

So I took a design that was somewhat more conservative, and it worked. So with smaller faces on the anvils, we were able to produce diamond. About that time, I think Dick Stratford found a guy down in California who would buy diamond grit. So we moved into production on diamond grit. We were very secretive about it because we were not really clear on the patent (6:12) ??? When we went into it, Tracy was pretty cavalier about patents. (6:20) He was the holder of the multi-anvil press patents, or at least the university was. He didn't think they were going to trouble us. However, the process patents, which were the result of his genius, really, his work at GE, really well done by GE, and they had (6:44) field covered.

We thought we had a possible argument as to why we were not violating the patents. In retrospect, we were, I think. I'm not a lawyer, but I think we were. But anyway, we kept a low profile, and we proceeded to sell diamond grit to Louis (7:04) Worms in Los Angeles. And that was a pretty thriving business for a few years until the patent ran out. Now the (7:20) Dion DBT side of the business was doing fine. But when the patents ran out, we were getting $1.50 a carat for our grit. And then over about a two-year period of time, the price ran down to 35 cents a carat. GE and DeBeers, who dominated the market, had no intention of permitting competition in the market. And so with technical specifications of the product (7:53) were ??? fine, customers knew what they wanted, and we had to meet spec, but we couldn't offer a different product, all we could offer was price. They would not permit us to undercut them on price. If we dropped the price, they'd drop it, and they ran it right down.

J: Do you know what year this was? (8:10)

D: I'll guess 1972. During this time, Megadiamond, which was the company that was going to exploit Tracy's development of the polycrystalline diamond, and the company in which the Jolis brothers had interest, proceeded to try to develop and market products. However, at the same time we were trying to develop and market a product, GE had been producing superior products. We were not really clear on it. We didn't do a good job at all, comparing the products. So we wasted a lot of money on developing inventory that we couldn't sell. Now this was at the instigation of the Jolis brothers and the manager at the time. We fought against it, but we were out-voted. We made a big inventory of stuff that we ultimately couldn't sell. (9:21)

And the company was really kind of floundering, and that would have been about the time that David came back. He'd been at school. And working for Ingersoll Rand. He came back to Provo, decided to work on his own and develop a (9:49) down ??? drill.

As time had progressed, from maybe the late 1960s, early 1970s, Tracy had not only backed out technologically from the company, but he'd backed out from a managerial perspective. The three of us, any two who agreed, could drive the force of the company. Bill and I saw things much, much differently, and Tracy wasn't interested in casting (10:29) defining a vote. He just backed out of it, and so he left Bill and I without having the control, and we butted heads. And I don't (10:41) ??? confrontation well. I didn't manage my part very well. And Bill didn't manage his very well either, for that matter. And Tracy didn't manage his very well. While we were butting heads trying to figure out what in the world to do, Dave came back. And he could see that his Dad was ignoring a fairly significant asset. In essence, he got his dad's blessing to decide where to go, what to do. (11:18)

So Dave talked with Bill, he talked with me. He felt more comfortable with the direction I thought the company should go in. And so, he joined me in trying to set a direction for the company, and about this time, we brought all the companies back together under one entity, which should have never ceased being. And along the way DBT had acquired a company called Supercut, that made grinding (11:59) wheels in Chicago, managed by a fellow named Art Frigo who had a 10% stake in Supercut. And Dave and I proposed that we combine all the companies and we make art Frigo manager of it. Bill thought that Art Frigo was a fine manager until he found out that

he was going to be supplanted. Bill was president of Megadiamond. No, he was president of everything, I think, at the time. (12:36)

When we were going to combine the DBT, the Dion, the Jolis brothers, and Supercut into one entity and have Art run it. Bill found this totally unacceptable. I'm a little hazy on what happened with this. We kicked Bill out as president. And he became an opponent of having Art run the system, and by default, one of the minority holders, the swing holder was (13:41) Doug ??? said, "Well, Dave, it looks like it's your baby then." So Dave assumed presidency of the diamond grit part of the operation.

Louis Pope had been general manager operating under his dad for a diamond bit operation. And, in essence, Dave replaced Louis. And Bill became president of Megadiamond, so you can imagine what a wonderful atmosphere there was in the building. Louis went off, and he was ticked about it and decided he would set up his own company, which he proceeded to do—U.S. Synthetics. (14:35) So Bill was supporting Louis while president of Megadiamond, operating in the building. It was a very strange set of affairs. And soon as we found out that Louis was setting up a company, we felt that, in essence, he was just taking technology that belonged to DBT and using it for his own good, and we sued. (15:00) Bill then countersued us for the way he had been replaced as manager. After a brief period of time, his lawyers advised him that his position was untenable to be president of one company operating in the building and then suing people who were in the building (15:23) in support of his son ???

I don't remember the convolutions, but somehow we brought Megadiamond and Dion, DBT back together. The Jolis brothers brought us a French company, (16:10) Cogema, who was interested in acquiring high pressure technology. We negotiated the sale, and we a sold technology package to them for $5 million, which was promptly consumed.

J: What's a technology package?

D: It was presses and technology in operating them. We built presses for them, we built supporting equipment. They managed the transfer. We built presses, we brought their engineers over, we trained them, we shipped things over, helped them set it up in ???(16:55) in France. And we used the money to intensify our research and development. Dave was very aggressive and encouraged us and took the lead in developing new technology. (17:25)

Somewhere along in here, Art Frigo helped us negotiate the sale with (17:40) Cogema, but he was getting bad vibes about the whole thing, and so he wanted out, and he wanted to take Supercut with him. It was his perspective that he brought Supercut to the group and that he was entitled to take it with him when he went. We didn't see much future in grit operation. This was a time when we were breaking even or even losing money on manufacturing grit. It turned out to be really an impossible thing to sell grit to Supercut's competitors. The original plan was that Supercut would take their output and put it in wheels. And with just the synergy of that integration, it turned out they couldn't use the bulk of what we made. And so it was going into idle inventory. And so they weren't much of an asset to us. They were making more money than DBT was, but that wasn't much. (18:51)

So Art wanted out. We wanted to combine both operations into one. I'm unclear as to why I ended up being president rather than Dave. I think some of the significant shareholders were prepared to support me where they weren't prepared to support Dave.

J: Do know what year that was?

D: Early 1980s. Possibly 1980. But anyway, I became president then through a total lack of communication with Tracy. He just handed it over to Dave, and did his own thing. Tracy liked to build and sell presses, and so that's what he did, (20:16) and this caused a little bit of friction because, he made the first presses, and he did a very good job at it. But he was inexperienced in issues that might come up with long-term uses of the machines. And we ran into problems which we solved. And he was taking the solutions that we had developed and putting them on other presses, which he was selling. This didn't warm our hearts very much. (20:50)

I don't think we ever said a whole lot about it because we recognized Tracy's inventiveness, skill, genius, the value of his name. We didn't want to antagonize him, and so we gritted our teeth, and put up with it. I bet he was gritting his teeth over a lot of what we were doing, so it probably went two ways.

But continued to develop new polycrystalline products. Dave was the leader in this, the creative force. But, Dave and I began to not see things the same

way, and we were struggling. We were now beginning to sell products again that were like the ones that GE and DeBeers were selling. And we were in competition with them while we developed independent products. Again we were running into the troubles in going head-to-head competition with GE and DeBeers. And I concluded that this was a losing strategy, that we would be far better off if we could find a partner who would use our products. And if they owned us, or we owned them, then there would be a common interest. And so one would have a captive supplier, the other would have a captive customer. (22:35)

And so I began to look around for possible buyers and became aware that Smith represented a really good opportunity. We started to develop Smith as a purchaser the same time were developing products especially for them. The French got wind of this, and they wanted to buy us, and (23:07) National Lead got wind of it and approached us, and they were interested in buying us. The pivotal shareholders pretty much relied on myself and my judgment on where to go. I didn't want to sell to the company to the French because I didn't feel comfortable about their business plan. Their business plan was to sell in competition with GE and DeBeers. I didn't think it was a good business strategy. (23:47) Cogema is the French Nuclear Energy Company. They are big. They're very profitable. I think they build and possibly run nuclear power plants in France. They process uranium, they sell uranium, they mine it. This investment meant nothing to them. (24:10) They could have poured unlimited money into the whole thing. But I didn't think they would, and I didn't really want to commit the future of the company and the employees to their tender care. My brother was working with us, and I had a special incentive to see to it that I didn't leave him hanging. (24:32)

National Lead crafted a very nice proposal. They would have paid us 10-20% premium over what Smith was prepared to pay. But the deal had to be approved by their board. We could negotiate one and then they had to take it to their board for approval. We had about consumed the money we got from the sale to Cogema, we all of a sudden got hit by a summons from GE. They were launching a suit against us for patent violations. We would have lost that big time. But they offered to sell us the right for a half million dollars. About this time Dave had become unhappy. I don't know if he thought it was himself, or himself and his family, but he felt they were not getting their fair share out of the whole thing. (26:02)

So we had an unpleasant discussion, and things were getting (26:14) down to ???. We were losing money, we had consumed our money, we were way down the track towards making a sale. If we were to not make a sale, I would have had to personally carry the company, for several months, through its losses until we found an alternative. I was already carrying it. The bank had cut off our credit, in essence, every time a payable came in, they took the money, but they didn't loan us any more in return. So I was having to carry the company for the last two or three months at the tune of about $90,000 a month. So I was feeling considerable pressure to close the deal. (27:00)

I could have fired Dave and said, "Okay, you won't support the sale, which was what he threatening not to do. Go do your own thing, then." (27:18) I'll lose, so will your family. We'll see what comes of it. I thought this would be the old proverbial cutting off my nose to spite my face. So he and I negotiated where he would get his share of the sale. Then we proceeded with the sale. We negotiated with Smith where we took a quarter-million dollars less on the purchase price. They picked up a quarter-million share on the patent fee, and we purchased the royalty rights from GE. Then we consummated the sale of the company. Going in I rather anticipated that my tenure would be brief. It was. After about a year I was relieved of the presidency. But during all this time, although we had negotiated terms where Dave got a share of the sale, we didn't find a harmonious management approach. So he and I continued to butt heads through that year. So that's a big part of the reason they brought in a replacement. We needed someone who wasn't involved in the fray to sort things out and move the company forward. (29:08)

Dave had used the proceeds from the sale to launch Novatek or one of its variations. He became less and less involved at Megadiamond and eventually spent all his time developing Novatek. I was set at liberty, and after a little bit, I did other things in the high-pressure field. When Bill resigned, he worked with Louis, and eventually they made a very nice success out of U.S. Synthetics. After Dave went on his way to Novatek, I think Tracy did whatever high-pressure work he did with Dave. I don't think he did anymore with Megadiamond. I don't remember exactly when Tracy Jr. left and went to work with Dave. Probably about the same time I left. (30:48)

When Tracy left, he focused quite heavily on something that had always been a burr under his saddle. He felt that he was never given proper credit for the invention of the process and the equipment. I had the opportunity to talk with the other men of the team independently. I asked each, “What’s your perception of what happened?” And I think Dr. Bundy perhaps described it best and I told what I think is the best view of what happened. He said, “Of course it was a team effort.” We met daily, the four members: Tracy, Dr. Strong, Dr. Bundy, and (31:54) ??? We each had our own phase of the operation we were managing. We critiqued each others’ ideas, made suggestions. And so we all knew what each other was doing. We all made suggestions to what the other was doing. (32:17) ??? There’s no question about it. Tracy’s hands were at the controls when the first time the diamonds were made. But his success was the result of a collaborative effort. (32:31)

I think that’s probably the case, but they all contributed in a big way. I think Tracy had particular insight and genius, and perhaps contributed more than the others on the team, but it was a team effort. In fact, Dr. Bundy said that Strong made diamonds earlier. He said, “There’s no question in my mind that Strong made diamonds first. But they couldn’t reproduce it, and if you can’t reproduce it, then it doesn’t count.” So Tracy made the first diamond. He was the leader on that phase of the operation. He did a fine job, very good, very confident man. (33:27)

But General Electric I think very foolishly wanted the credit to go to General Electric rather than Tracy. And so they promoted it excessively as a team effort, rather than being Tracy Hall and the team, which is what they should have done. And had they done it, there’s every chance they could have gotten a Nobel Prize for Tracy. By distributing the credit, they diffused it. Tracy always felt underappreciated. He wanted credit from the engineering and science community that he felt he didn’t get. He was aggravated by the fact that, shortly General Electric announced the success, the Swedes came out and said, “We did it too, but we didn’t think it was very important, so we didn’t tell anybody. In fact, we did it a year before Tracy did.” They tell a plausible story, but it muddied the water further. They were saying, “We did it first, we just didn’t tell anybody.” GE was saying, “The team did it, and Tracy was part of the team.” And this rankled him. It rankled him. He spent a lot of time, or mental effort at least, in trying to right what he felt was a wrong.

J: So in 1972, he received an award for creative invention from ACS. Is that not even the recognition . . . ?

D: If I remember right, they analyzed it like this: Tracy's name was on the patent for the equipment that made the diamond, Tracy's and Tracy's alone. Others' names were on some of the process patents. They said, "Without the equipment, diamonds would not have been (36:113) synthesized. With the equipment, diamonds were a certainty, it was only a matter a time. And so that being the case, the man who developed the equipment really was responsible for the invention. And they gave him the credit. But DeBeers, in essence, supported the Swedish position. And the Russians probably claimed they did it first too. But I don't think anybody paid much attention to them. (36:52)

But Tracy needed more than that. He was a complex man and not always easy to understand. A very humble, capable man, honest. There was no malice in his heart, but that rankled on him, and he spent a lot of energy trying to get that rectified. (37:20)

J: Where did you grow up, and how did you get into high-pressure?

D: I grew up in Murray. I'm a Utah boy. I got my Ph.D. in the combustion field. I went down to (37:42) ??? California working on the Poseidon program. But I went down to ??? resumes so I could come back to Utah. There was an opening at BYU. I came back in a minute.

J: So you got your Ph.D. from BYU?

D: From the U[niversity of Utah]. I came back as a professor to BYU. I came back 1963.

J: That's the year you met Tracy.

D: My involvement in pressure came from Tracy. He was my teacher. He was my mentor. When we decided to make a company, he took us downstairs and set us up on the press to make the run and make diamonds. I think both my run and Bill's failed and Tracy's run succeeded. It was a mixed demonstration.

J: Was that the day you decided to form your company?

D: It wasn't the same day.

J: It was after?

D: It was after, but not long after. In late December 1965/ early January 1966 we decided to proceed. But then we had some (39:16) ??? to establish a corporation that's required. In April of 1966 is when we incorporated. But by that time, Tracy would have shown us how to do it.

J: And then you were relieved of your duties at Megadiamond. Did you come straight here?

D: After a few months, I became a consultant for a company back East called Tempo—I can't remember what else. The fellow there had a piston and cylinder apparatus, and he was a promoter. He was promoting all kinds of unscientific possibilities with the apparatus. He was using me for whatever contact and prestige I had in the field. I was using him to keep myself active in the field and visible. So we were each using the other. After I consulted for them for about a year, Norton company had a diamond (40:41) tech center in Salt Lake. They owned Christensen Diamond, and I was hired to manage the tech center. This would have been about 1990. I left Megadiamond in 1987 or 1988. After a few years, Norton decided to bring the research operation back to (41:16) Wooster, Massachusetts. And it was a foolish venture, and I wanted no part of it. So I wouldn't go back. They moved such portions as they could back. They had been producing the Tungsten coatings for Christensen. And they were just going to walk away and leave Christensen hanging. They approached me about the possibility of setting up a company to do the coatings since I was going to be at loose ends, and my son also was going to be at loose ends. He thought he'd be interested, so we set a company just like Christensen, and that's kept us busy ever since. (42:03)

J: How did you get the name? What's significant about Siva?

D: Siva started out as a land and building construction company in a venture in Spanish fork. It stood for Sierra Vista, which was the development. It taught me fairly soon that you can be a lot of good things, but you'd better be good at development if you're going to do development, and I wasn't. So I got my fingers burned and got out of that involvement, but I kept the

incorporation that was involved, I kept the name alive. So I had a dumb name to use when the time came to (43:04) need a company. So we had it all set up and used the assets to move into this business. (43:12)

(43:32) Bill said once, and he put it very well, He said, “Had there been no Bill Pope, there would not have been Megadiamond. Had there been no Tracy Hall, there would not have been Megadiamond. Had there been no Duane Horton, there would not have been Megadiamond.” It’s really true. We each contributed, but we didn’t have a satisfactory relationship and vision of the future. We originally said, “We’re going to build a company that has maybe 8 or 9 employees, and fairly very quickly we strayed from that vision, but we never found a substitute, a common vision for it. I would give Bill credit for the business side and particularly for the promotional side. He kept us in funds when we would have died otherwise. Tracy provided the technological platform to work from, and I rolled up my sleeves and developed that platform till we had something that produced it. That’s how I would say it in hindsight. But, there were forces involved that we didn’t cope with very well. I don’t think any of us did very well. I think we all should be ashamed with how we comported ourselves. (44:52)

(45:45) Prestige was very important to Bill, and it was one of the things that was troublesome. He had his success with U.S. Synthetics. I found life getting too complicated for me, but I made a few bucks and have a simpler lifestyle. Dave wanted the freedom to create, develop, and explore different approaches to management life. He got that. Furthermore, he did it successfully. More credit to him. Tracy wanted a simpler life and the chance to pursue achieving better recognition. He got that. Louis got financial success, which was really important to him. It’s one of those rare occasions where everybody came out with what they wanted and needed. I guess even Tracy Jr. He needed enough money to not be responsive to everyone. And he got that. It’s not often in life that it works out that way.