**Choosing to Develop a Friendship Network Rather Than a Laser Weapon**

 I have led a rather stress-free, uncomplicated life where I can only think of one time I made a turning point decision. I am not sure if this fact is good or bad, it just is. I don’t do well with stress so I have tried to either avoid stressful situations or at least handle them with my forms of positive psychology.
 My dad never had many discussions with me about anything. I only recall him giving me advice on four occasions. I took his advice the first two times. He was very smart and had practical common sense.
 Dad’s first advice regarded summers at Camp Lupton in Woodstock, Virginia. I had gone there many summers as a camper and also then enjoyed being an archery counselor. I told my dad that during the next summer I wanted to work learning how to fix cars; my friend said he could get me a job. My dad owned a hammer, screwdriver, and pliers and had never taught me to fix anything. My dad’s advice: “you will be working your whole life, so go back to Lupton and have a great time again.” So I did.
 I don’t recall ever thinking in depth when growing up of what I wanted to do in life or where I wanted to go to college. When I was a senior at Fairfax High they gave us all an aptitude/interest test for careers. It said I should be a police officer or an astronomer, and I told my dad I didn’t think I wanted to be a policeman. He gave his second piece of advice: “astronomers don’t make any money, be an engineer.” I didn’t know enough to think differently so that was it - - engineer. Dad said I should go to Virginia Tech, so that was where I went to school. It was the only school I applied to.
 Tech wanted to know what kind of engineering. I just had the school catalog and no advice from anyone, and no knowledge of what different engineers did. There were more Mechanical Engineers at Tech than any other so I just said Mechanical. I assumed that was more general. It isn’t. I wonder if choosing another kind of engineering would have made much difference.
 Also, people were getting drafted and I thought if I had to be in the military I would rather be an officer. My dad was a Colonel in the Army Air Corps in WWll, so even though I didn’t grow up on a military base or around people in uniform, and didn’t qualify to be a pilot because my eyesight wasn’t good enough, it seemed OK to sign up for Air Force ROTC.
 I never thought much about switching from Mechanical, so I graduated in Mechanical. In hindsight, my next three years as an aircraft maintenance officer was the most interesting job I ever had - - especially the 9 months in the Congo (another story).
 When I could get out of USAF after 3 years I decided I would stay in if they would send me for a Masters. I really wanted to learn something and work from the ground up and being a maintenance officer wasn’t that. I couldn’t do the jobs that the people working for me did and I didn’t like that. The Air Force wanted to get ahead of the Russians in the space race so they offered to send me to GA-64, a special 24 month program at Air Force Institute of Technology (AFIT) to get a Masters in Astronautics.
 After AFIT Pat and I and baby daughter Julie were off to Edwards AFB, California. My 3 years at the Rocket Propulsion Laboratory, with 2 years in Advanced Plans, were awesome.

 I then took an aptitude test to see if they would send me for a PhD. I scored higher than 99% in scientific aptitude, but my verbal score was equal to a junior in high school… I could pick any school, and since I knew a lot about rocket propulsion I chose Purdue University. I then chose their Zucrow Propulsion Center and chose Dr. Bruce Reese, the Center’s Director as my major professor.
 Two side thoughts - - my lack of verbal skills and my choice of gas dynamics.
 I never was much interested in reading books when growing up, especially fiction. In the fifth grade a well-meaning teacher announced we were all to read the novel Moby Dick. It was a big book and all my friends struggled, but she warned us at the beginning: “don’t try to read the classic comic because you won’t pass my test!” I remember immediately asking the person next to me what a classic comic was, never heard of it. The next day I bought the classic comic Moby Dick. I never read one page of the thick novel. I got the highest grade on the test. To this day I have never read a fiction book. Pat and I have enjoyed a few fiction audio books as we make long driving trips.
 As for gas dynamics, the only course I ever got an F in was fluid mechanics during the fall quarter of my senior year at Tech. To start my senior year at Virginia Tech, I was selected as the Captain of Squadron D and I essentially spent 100% of my fall quarter on that.
 I mentally beat myself up the entire way home that Christmas and told my mother of my failure. She turned it all around with a simple question: “100 years from now, what difference will it make?!” I realized none. Thanks Mom.
 At AFIT I took Sharpiro’s “The Dynamics and Thermodynamics of Compressible Fluid Flow.” At Purdue, Dr. Joe Hoffman strangely told me to retake the same course with the same book. I got an A+ and showed the publishers how you could solve some of their homework problems faster by choosing to iterate on the ratio of specific heats. The answer arrived 5 times faster.
 During my next assignment at the Air Force Flight Dynamics Lab at Wright-Patterson Air Force Base I was able to come up with five inventions and one patent in gas dynamics - - a long way from senior year at Tech when I got the F as a result of not studying.
 Oh yes, Squadron D won all but one of the school awards in 1959 - - the Beverly Parrish Award for best squadron and company in the yearlong Corps competition (the Corps was 50% of the student body in those days), the Kohler Cup for #1 in yearlong drill competition, plus the Intramural Trophy for #1 in sports for the entire school. We never tried for honors in academics . . . But we truly had the most fun. We even won best float in the homecoming parade and had the best party that night! For the 50th reunion Squadron D had the biggest % turnout of all the other military companies and squadrons, great time and learned a lot at Tech. On graduation I received the Reserve Officer’s Association Medal presented to the Air Force ROTC Senior Cadet for having shown the most outstanding enthusiasm and leadership – the F in fluid flow was starting to fade in my mind.
 Now on towards why I am writing this “my turning point.” I started my part time business on December 7, 1969 just before getting my PhD from Purdue in June 1970 (the same month Pat got her Master’s in Education, and #4 child was born and we moved from Indiana back to Wright Patterson AFB in Dayton, OH - - also selling and buying houses that same month). Busy June, oh, and we also hit 7500 PV then and by September had passed my Air Force income with my part time business.

 My Dad advised me at Christmas before Purdue graduation to not do the business. He talked with his stock broker and they both concluded “my part time business couldn’t compete in the oligopolistic market of Procter & Gamble, Colgate Palmolive, Lever Brothers and Dart Drug.” I didn’t tell him no, and I didn’t know what oligopolistic meant, but three months later he asked me if I quit the business and I said no, we were doing it, and we made $300 last month. Dad said that was good.

Finally, the only turning point decision in my life. I was approaching graduation from Purdue and needed to select an Air Force assignment to start my nine year commitment after 3 years at Purdue. Dad took me to see Air Force Major General Paul Cooper. Dad had done a big favor for Lt. Paul Cooper when Paul worked for my dad in the Pentagon in World War II Aircraft Production. This was payback time and although I had never met Paul, I had heard about him very favorably my entire life.
 Paul’s job offer was to go to Kirtland AFB, Air Force Weapons Lab, and be the deputy for a Colonel Lamberson on a project called Eighth Card - - the first attempt at a laser weapon.
 Lamberson was assigned from 1969 to 1978 to lead the Air Force’s high energy laser program including the development of the Airborne Laser Laboratory which culminated in the destruction of a drone in 1973. For the story of Eighth Card there is a great reference: “The Airborne Laser from Theory to Reality: An Insider’s Account” by Hans Mark in Defense Horizons, April 2002, a publication of the Center for Technology and National Security Policy, National Defense Institute.
Lamberson never knew that I was offered the job to be his deputy, because I decided days later to turn General Cooper’s offer down and instead go to an interesting but more comfortable job at Wright-Patterson AFB (working for Ken Digges who had also just earned his PhD in Mechanical Engineering). Lamberson and I both had PhDs in fluid flow and he clearly was recognized as a brilliant guy. He retired as a Major General after 35 years of service and did many great things for our weapons research and development.
 Yes many would say, most would say, I made a mistake. For me, it was the right decision. I chose far less stress, more time with family, far more free time; buy a nice new home in a familiar metropolitan area, and yes, time to continue with my business and building its friendship network. For the next nine years I was pretty much my own boss - - both at Wright Patt and later at NASA Langley.
 It went all the way back to my understanding of what I wanted after 3 years as an aircraft maintenance officer. To me, I had probably a minority opinion, but I wanted to work on something from the ground up - - and when or if I got to a position of leadership I would be telling people to do what I knew how to do, and to do well.
 Maybe I should have been a police officer or an astronomer, but engineering was fine until I finally understood what I wanted to do and the right opportunity came along. I like that we can build it part time when we want, and develop on-going income. My 18 minute talk, [Rise to the Top](file:///C%3A%5CUsers%5CJohn%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C23I0OOZR%5CJohn%20Vaughan-Rise%20to%20the%20top.mp3), tells what I did to succeed and what my five main benefits were – good things, having nothing to do with the money, for my wife and 4 kids. I show the plan, encourage others, and build a friendship network; and I can enjoy doing that around the world, forever.

P.S. A final word about laser weapons, they finally have arrived …

 The magazine Military Officer (January 2017) has an excellent and surprising (to me) article: “Warfare goes Sci-Fi - - after a series of fits and starts, laser-based weapon development has picked up momentum.” This magazine article inspired me to think of my career and to then write this story. The Eighth Card program (that I was invited to be part of) was a chemical laser and they found out after years of trying that it was never possible to use as an operational system. The technological breakthrough finally came in the early 2000s with the emergence of high efficiency, all-electric solid-state lasers. Research finally got back on track. That has led to a Laser Weapon System (LaWS) development test, Boeing’s demonstrator, and now Lockheed Martin’s Space Systems prototype.

 They are using 10kW commercial lasers, going up towards 50kW soon. Lasers can’t do everything, but for certain applications they now have significant advantages over conventional kinetic weapons. They are much less expensive and far more accurate. They are finally militarily useful.

 So in summary, my work life has been different than most. I have never interviewed for a job and during my 20 year Air Force career I really was only directly supervised for 3 years. Wonderful Major Howard Mason, a World War II pilot who helped 2nd Lt Vaughan get adjusted to my first year in flight line maintenance at Dover AFB. My 2nd & 3rd years in the USAF I had no boss - - since I was 1 year in the Congo and 1 year as night shift Maintenance Control Duty Officer (when no one of higher rank was around). Then 2 years study at AFIT and later 3 years of study at Purdue as a student. For my 5 years at AFFDL, Ken Digges was my boss on paper but really like my good friend and personally sponsored Platinum. My last 4 years in the USAF were on a joint assignment at NASA Langley’s Aeronautical Systems Division in Virginia when my USAF boss I never saw was at Wright-Patt in Ohio.

 So my only real challenging boss was a civilian, Bill Schnare. Mr. Schnare was the top civilian at the Rocket Propulsion Lab, and was the head of Advanced Plans. He held an annual review of everyone’s projects and was feared by all. Schnare would crucify Captains during their annual project presentations. Even the Lab Commander yielded to Schnare since Schnare was so experienced and forceful. For me, working directly for him, I got choice things to work with, especially being the rocket lab’s contact for the top secret MIRV work and strategic systems plans being done at Cloudcroft, NM by the small group of brilliant and scary German scientists brought over after WWll.
 I used to come home after work at Edwards and start complaining about Schnare. One time as we entered our bedroom, Pat stopped me and said: “look, I listened to Schnare talk after work, during and after dinner, but I am not going to bed with him!” Thanks Pat for always caring and keeping me centered, and on track in life.

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