Hoyt Memorial Lecture

Embracing Adversity: Mining the Riches from Life's Challenges

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ABSTRACT

Life is unpredictable and often presents significant challenges and hardships. These challenges and hardships do not determine our ultimate destination, but rather give us an opportunity to gain experience and find new meaning. Adversity often allows us to expand our vision, renew and restore our appreciation, and develop new skill sets to thrive.

Career challenges often mimic life challenges. The successful navigation of establishing successful programs to beneficially reuse foundry sands required an optimistic vision of what could be possible. Drawing on the experience of navigating personal challenges provided a subconscious roadmap that assisted in the strategies necessary to achieve progress and eventual success regarding beneficial reuse.

Keywords: unpredictable, challenges, hardships, hurdles, rejection, opportunity, growth, vision, renew, restore, thrive, support, reciprocity, appreciation

INTRODUCTION

Life can be incredibly challenging from time to time and much of what we experience is unpredictable. We are often faced with unique challenges, both personally and professionally. There are opportunities that are presented by these many challenges, but it is incumbent on the individual to build up both intellectual and emotional resources to grow from these experiences, and then visualize potential alternate outputs, to the point where one can regain or rebuild their confidence, restore one's emotional footing and not only survive, but thrive. In addition, experience, both good and bad, tends to go hand in hand with building wisdom, confidence, and finding positive outcomes to difficult situations.

ENVIRONMENTAL MOMENTUM

Before there was any momentum or significance relative to recycling within the United States, there were several monumental negative environmental events that took place in the decades before. One of the most notable of these events took place in Cleveland, Ohio on June 22, 1969. The burning of the Cuyahoga River only lasted for 20 minutes, but the impact forever left an imprint on the environmental culture of this country and beyond. The environmental neglect that took place in multiple decades before, had finally come home to roost. Unfortunately, the mental image of a burning river will always be something that defines the image of the city of Cleveland.

The 20-minute-long fire on the Cuyahoga River became a catalyst for environmental awareness and it helped to spark a regulatory revolution. It was reported that the fire reached heights of five stories before it was extinguished.[1] Interestingly, because of the short duration of the fire, there were limited images available to the media. Many of the published articles and stories about the fire of 1969 utilized photos from previous fires, including images of the river catching fire from 12 years earlier. The mighty Cuyahoga had been ablaze over a dozen times before this event, dating back well into the 1800s before that fateful day in 1969. All that aside, and for a myriad of reasons, this time things would be different. The national media could no longer ignore that industry had polluted a primary tributary to Lake Erie in one of its largest cities, just a few miles from where the area residents obtained and still obtain their drinking water.

To be fair, while this event certainly helped to instigate environmental awareness and regulatory change, the momentum had already been building. There were several other individuals clamoring for change and attention on environmental and regulatory shortfalls, including most notably author Rachel Carson, who wrote the best seller, *Silent Spring*.[2] Her book was published on September 27, 1962. Her writings documented the environmental harm caused by the indiscriminate use of pesticides while also accusing the chemical industry of spreading false information. She also outlined how public officials accepted the industry's marketing claims unquestioningly.[2]

Carson's research and subsequent writings helped to bring environmental awareness and concerns to the American public. The book was met with fierce opposition by chemical companies, but it swayed public opinion and led to a reversal in U.S. pesticide policy, a nationwide ban on DDT for agricultural uses, and along with several other events, including the Cuyahoga River fire of 1969, gave the US government impetus to establish the US Environmental Protection Agency.

However, much of the change came in Cleveland, Ohio after the famous fire. Cleveland's mayor at the time was Carl Stokes. Stokes is often referred to as the first African American mayor to hold office in a major US city. Stokes served as mayor of Cleveland from 1968-1971. Stokes recognized the gravity of what was happening in Cleveland and utilized the momentum and attention to not only mobilize local entities to support the clean-up, but also emphasize the need for two things, federal funding to assist with the clean-up, and cultural change. Stokes recognized and subsequently articulated that some of the greatest environmental risks seemed to be in lower income urban areas.[3] History is likely to view Stokes' early comments regarding the potential for disproportionate geographical distribution of environmental issues as visionary. Today we would be classifying his comments aligning with the Environmental Justice movement.

In addition to the events in Cleveland, more support for environmental change came on April 22, 1970, a senator for the state of Wisconsin, Gaylord Nelson, organized a "teach in" protest to spread awareness of environmental issues facing the country. It is estimated that over twenty million individuals participated in this event across the United States in 1970. Clearly this protest had staying power, as we now recognize April 22nd as Earth Day.[4] Later in that same year, on December 2, 1970, President Richard Nixon proclaimed the creation of the United States Environmental Protection Agency (USEPA) with the purpose of protecting human health and the environment. While the precursor to the Clean Water Act (Federal Water Pollution Control Act) was created back in 1948, substantial changes and reorganization of the original act were completed in 1972. Nixon vetoed the Clean Water Act legislation on the grounds it was too expensive, a bipartisan effort overruled his veto.[5] That same year, the Ohio EPA was created, and through its establishment, a roadmap was created for other states to follow in constructing their own state-based environmental regulatory agencies.[6]

The history of these events and the evolution of environmental awareness changed the fabric of how regulations would be created and enforced in the United States moving forward. The indiscriminate depositing of industrial wastes, and byproducts from manufacturing, farming, and other processes would now be under scrutiny beyond those clamoring for awareness of potential problems. The pendulum was swinging toward environmental protection with significant momentum, and more importantly, with federal and state structural and financial support.

THE FOUNDRY INDUSTRY AND RECYCLING

The foundry industry is notoriously slow when it comes to telling a good story, especially when it comes to recycling. This is due to multiple factors, including but not limited to, that many foundries are small businesses, and a disproportionate percentage of their sales are business-to-business rather than business-to-consumer. It is also because the foundry industry had been recycling materials well before "it was cool." While people recognize that the foundry industry relied on scrap metal to make castings, it could be argued that society just took that service for granted.

FOUNDRY SAND BENEFICIAL REUSE

The beneficial reuse of foundry sand had been happening long before the term beneficial reuse was used. In fact, foundries had been recycling sand since their inception as part of their manufacturing process. Green sands are used repeatedly as part of the standard foundry process to make quality castings. Properties of the materials change minimally from cycle to cycle, only needing to be replaced when the engineering properties of the sand is no longer capable of producing a good mold and therefore a good casting.

As part of the process, new sand is introduced to maintain molding characteristics and some excess system sand is then typically removed from the process and discarded, sometimes going off-site for disposal in landfills. While landfills have always been home to more traditional household and industrial wastes, foundry sands sometimes were viewed differently. Foundry sands themselves, especially from green sand foundries pouring iron, steel, and aluminum, typically did not contain any additional significant contaminants. As such, they were readily used for fill or sometimes placed on the foundry property rather than going to a municipal solid waste landfill, thereby avoiding outside disposal costs.

The practice of using foundry sand for fill around foundries and in foundry towns had been common practice before the creation of regulatory framework. There have been limited environmental issues raised over time at these locations, and this likely improved the scope of opportunities for foundry sands in construction applications as regulatory framework was developed. Despite this, there would be many obstacles to navigate and hurdles to clear to create a formal path for environmentally responsible reuse of foundry sands.

HURDLES TO RECYCLING FOUNDY SANDS

Perception can become the beholder's immovable truth. We as humans see things a certain way, and we are sometimes unlikely to alter that viewpoint once it is established. At some point in the last 50 years, a sizable portion of society made the distinction that wastes or by-

products from an industrial process were likely materials that were toxic or in some way would threaten the environment or human health. To be fair, there were many examples of mismanaged material that came from industry that were harmful to the environment, and many of these materials were improperly handled or discarded. One of the most famous examples of mismanagement of wastes took place in Niagara Falls, New York and it gained national attention in the 1970's.

LOVE CANAL

Love Canal is a well-known neighborhood in Niagara Falls, New York, and it unfortunately became one of the most famous environmental disasters in the United States in the 1970's. The area was home to a landfill that was home to decades of dumping of toxic chemicals used in the manufacturing of dyes, perfumes, and solvents for synthetic resins in the 1940's by the Hooker Chemical Company.[7]

The land was subsequently sold to the local school district in 1953 after threat of eminent domain. Over the next 30 years it attracted national attention for public health problems, displacing numerous families. Many negative health issues were attributed to the dumping.

On August 7, 1978, United States President Jimmy Carter announced a federal health emergency, and called for the allocation of federal funds, and ordered the Federal Disaster Assistance Agency to assist the City of Niagara Falls to remedy the Love Canal site. This was the first time in American history that emergency funds were used for a situation other than a natural disaster.

Congress subsequently passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), better known as the Superfund Act. Love Canal became the first entry on the list. After years of cleanup efforts, the site was deleted off the list in 2004.[7]

MORE ENVIRONMENTAL MOMENTUM

Love Canal clearly had awakened the senses of the USEPA, not only about the unmitigated handling of wastes, but relative to the potential impact on human health.[8] Public awareness of the problems created by the dumping at Love Canal soon became more public beyond the local area, thanks in part to angry homeowners that took matters into their own hands. On May 19, 1979, angry residents detained two officials from the USEPA, urging them to declare a national emergency at Love Canal. Two days later, President Jimmy Carter obliged, declaring a national emergency at Love Canal.[9]
Among the lessons learned from Love Canal were that there were likely many locations across the country where previous indiscriminate dumping of wastes could negatively impact the environment and human health. It also became an example of how local citizens, like the leader of a local homeowner's association, Lois Marie Gibbs, could become empowered, mobilize, and drive regulatory change.[10]

There is no doubt that President Carter's actions as well as the area residents of Love Canal raised awareness of environmental issues and health concerns beyond their community. Raising public awareness to these problems is important. One of the unintended consequences that situations like this can create is that blanket labels begin to be placed on companies that manufacture things and create wastes. We have seen terms like "corporate polluters" and "corporate welfare" thrown around by politicians and some public interest groups for various reasons. This type of broad-brushed labeling unfortunately lumps the most cautious and environmentally conscious companies with those that are less diligent in deploying protective measures and policies. This type of blanketed rhetoric has driven many individuals to leap to undeserved conclusive criticism toward more innocuous recyclable materials.

On multiple occasions, some foundry sands have been unfairly labeled as a potential cause for environmental problems or concerns without an accurate assessment or incomplete data to back up those claims. Researchers from Grand Valley State University, that were well-meaning in their efforts, co-authored a study in a nearby area where there was some contaminated sediment. In the paper, reference was made relative to foundry sands contributing to the environmental contamination. While foundry sands were indeed present in some of the locations in question, they were not the sole industrial by-products present. It is extremely unusual for significant concentrations of heavy metals to be present in unmingled modern foundry sands from iron, steel, or aluminum foundries. While unsure of how those wastes were handled and possibly commingled in these two specific foundry instances, the sand from these two foundries were mentioned as the primary cause of the contamination.[11]

A few years later, on December 8, 2004, a local newspaper, The Muskegon Chronicle, published a headline raising the issue of potential lead contamination on an old foundry fill site where an old iron foundry had deposited some foundry sand. The headline read; Creek Pollution Suspect: Foundry.[12] The article put an environmental bullseye on the back of the foundries in West Michigan. The article, written by Jeff Alexander of the Muskegon Chronicle, touted the opinion of a local resident and her theory about what was causing the contamination of Ryerson Creek. The local resident's comments were very concerning but lacked any scientific data. It didn't matter, the accusation had been made and the newspaper published the comments. The damage had been done.

One critical item the newspaper failed to mention was that the site in question had been repurposed after it had been used as a fill site. It was later used as a scrap yard. It is not uncommon for old scrapyards that have processed automobile scrap to have environmental concerns relative to the soils and runoff. The heavy metals in the levels that were mentioned in the article were not consistent with what would typically be contained in spent foundry sands coming from an iron foundry, like the one in question. However, the publication of this information erroneously pointed the finger directly and unequivocally at foundry sand, thereby creating an incredibly negative public perception.

At the time, I was working for Resource Recovery of West Michigan, a foundry-owned recycling company charged with the mission of environmentally responsible recycling of foundry sands. My sole focus was promoting and educating end-users, regulators, and the general public about the benefits of recycling these materials. I attended public meetings where more fingers were pointed at foundries, and I challenged the interpretive results of the information, including directly challenging the university professors. I participated in follow-up meetings with both the newspaper and the university researchers to help explain their errors. After some initial skepticism and through the sharing of more information, they were swayed in a positive direction from their initial position, but it was not easy to get there.

These types of incidents, where there is a grave misconception about the safety of a recycled material, can decimate legitimate efforts to use recycled materials. Misinformation can have a long-term damaging impact on how the public perceives a certain industrial by-product. Generally, the bias that is created when bad or incomplete information is disseminated in the public domain, regardless of accuracy, may have long-lasting negative repercussions.

Recycled foundry sands in West Michigan and throughout the country were not always immediately well-received. I believe most of this was the result of a lack of education and understanding about how these materials were generated. Secondly, I believe there is a built-in bias that when a for-profit company is recycling something, it is driven primarily by economics rather than a propensity to just do the right thing. I heard the latter of these two arguments directly from both the general public and a few regulators. As a recycler of these materials in West Michigan, we were often greeted with comments about the potential risk of contaminants contained in our materials. When we would delve further into the comments, we often heard it was because of something they heard about or read in the local paper.

English poet, philosopher, and theologian, Samuel Taylor Coleridge once said; “Every reform, however necessary, will by weak minds be carried to an excess, that itself will need reforming.” While Taylor was likely not speaking of environmental regulations or recycling, these comments fit his narrative. I would argue that the majority of the environmental regulations that have been promulgated since the early 1970’s were created with good intent, and most were highly necessary. I would also argue that a general mistrust of business, even somewhat demonizing of businesses as only being profit conscious, was completely unnecessary. Much of the increased attention to environmental issues simply became black and white. If you were manufacturing something, you were polluting and likely trying to get away with it.

Furthermore, many in the general population, as well as politicians hoping to gain favor, cast all corporations and manufacturing companies as greedy industrial polluters that could care less about people or the planet. This stigma is something that has followed manufacturing around for the last 50 years. One could argue that some of this attention was well-deserved while some was somewhat misplaced. This phenomenon and added negative attention resulted in a higher bar relative to allowing the responsible recycling of some industrial by-products. Among the materials often unfairly labeled and scrutinized was spent foundry sand. Overcoming the stigma of a dark-colored industrial byproduct that was derived from such a raw manufacturing process created many challenges. Adding to that challenge was that the industry overall was primarily made up of smaller businesses. Simply put, many smaller businesses did not have a large marketing and or public relations staff to craft positive messages about their process or their recycling efforts.

As a result, many in the foundry industry believed the pinnacle of accomplishment was simply to avoid some of the tipping fees on disposing of materials in landfills. The thought process was the landfills would take in the material at a lower fee because they could use the material for daily cover. Daily cover in landfills is a widespread practice where an aggregate or similar material is utilized to cover trash and other waste to keep the waste from blowing around or emitting odors. Foundry sands tend to work well for this application and help in stabilizing the lifts or various levels in a landfill by providing a highly compactible and uniform material. Sands also are particularly good at filling voids left by the gaps in other commingled wastes.

REJECTION

Rejection is the act or action of not being accepted. Those who have ventured into the land of expanding the beneficial use of foundry sands beyond use in local landfills most certainly received more than their fair share of rejection. As a result of the history already discussed, efforts to recycle these sands have been challenging.

Based upon my own first-hand experience, I can confirm that regulators often responded with skepticism that foundry sand was safe to reuse, and they often had doubts that it could be successfully recycled in an environmentally responsible manner. Eventually, the sharing of data, in-person meetings, engaging independent scientists, and continued dialog proved to be a way to educate even the harshest of critics. However, while we eventually gained a modest amount of acceptance, overcoming the regulatory hurdles to gain acceptance of a recycled material was only the beginning. We still had to work our way through the skepticism of end-users.

For contractors or end-users, the list of reasons why someone would not or could not use foundry sand for a sand-like application seem endless. Reasons for rejection by end-users included but were not limited to color, odor, grain shape, gradation, grain fineness, sieve distribution, purity, clay content, etc. Regulatory concerns were also raised as a potential hurdle on a regular basis. Many end-users simply said they did not want the hassle of dealing with a recycled material that had regulatory constraints.

OPTIMISM AS A WAY OF LIFE

There is some debate as to whether optimism is something individuals are born with, or they develop based upon environmental factors. There is a large contingent of researchers that believe that humans have a cognitive bias toward optimism at a rate at or near 80%.[14] I suppose the optimist would suggest this is a good thing and the pessimist would say it is not.

Winston Churchill once said; “The pessimist sees difficulty in every opportunity. The optimist sees opportunity in every difficulty.”[15] This is a very simple, but pointed assessment of what defines the difference between an optimist and a pessimist.

Taking on the challenge of convincing end-users and regulators to accept the beneficial use of foundry sand has always been challenging, and I would argue, requires a healthy dose of optimism. I endured a lot of rejection, which tested my ability to remain optimistic. Initial rejection was typically based on skepticism that a discarded industrial by-product would not perform as well as a virgin product, not to mention come with built in environmental concerns. I often had to reframe my approach with end-users to gain their confidence. Gaining the confidence of these end-users required continuous attention to sharing of the relevant data and positive framing of how these recycled products would perform. Many of the initial arguments that I utilized were initially built upon how these sands were utilized in the foundry process. I often would focus on the engineering properties of the sands, and how they were consistent, which allowed them to be used successfully to make good castings.

I often started these discussions with the explanation that foundries required a high-quality specialized sand to start with. The initial dialog included that foundry sands were not simply indiscriminate run-of-the -mill sand mined from any random local sand pit, but rather had to exhibit certain engineered properties to make a quality, defect-free casting. For contractors and end users, this argument seemed to make sense from the beginning. They understood the fundamental requirements of a manufacturing process, and as a result, they recognized that a sand that was initially used in an application that demanded equal or more testing than their standard sands could be something worth considering. Consistent gradations and chemistries were important to them in most all their end-use applications. As a result, efforts to positively convert a negative perception into a positive one often gained traction with pointed, positive, and structured discussions.

The convincing of the regulatory community would not be as easy. Initially, I found that many regulatory agencies had limited enthusiasm to encourage the beneficial use of industrial by-products. This was not an opinion without reason, and to judge them without understanding their perspective is unfair. Regulators that were charged with evaluating beneficial use options beyond simple straightforward approvals sometimes were required to balance risk versus reward. Typically, in my experience they approached granting approvals conservatively. Over the course of my career, I learned that the regulators that I worked with were often not so concerned about those that approached them directly or transparently, but rather, those that did not engage with them at all.

Traditionally, regulators are charged with protecting the environment from practices or materials that may negatively impact the environment or human health. They are required to operate at a high standard to prevent negative environmental impacts. This applies to recycling industrial byproducts as well as enforcing traditional rules and regulations. In my experience, the newness of beneficial use of foundry sand created many challenges. Regulators were not as familiar with recycled materials, their variability, and a general understanding of the content of those materials. This created new challenges for regulators and somewhat of a moving target when it came to evaluating the various types of foundry sands. Foundry sands from iron, aluminum, and steel foundries are typically very different from a sand that is produced by a foundry pouring leaded brass. The process of understanding these differences created a reasonable delay in some streamlining of the regulatory process on a state-by-state basis.

There are few disadvantages for the overly conservative regulator, and there are most certainly significant risks to the regulator that is too flexible regarding regulatory

policy or interpretation. With limited upside to the agencies, including public scrutiny, the foundry industry had to establish that these sands could be used safely, show abundant sources of data outlining that some sands were just as clean if not cleaner than naturally occurring sands, and gain support from independent sources, such as universities, that would corroborate these summations.

Throughout the mid-1990s and beyond, the American Foundry Society (AFS) and a non-profit entity, FIRST (Foundry Industry Recycling Starts Today) began the process of building a database of information showing that foundry sand could be used effectively and safely after it had exhausted its purpose in the foundry. Several state foundry associations were also active within this effort. In 2002, the US Department of Agriculture's Agricultural Research Service (ARS) launched a collaborative effort to determine if foundry sand could be safely used in agricultural or horticultural applications. The Ohio State University, Penn State University, Purdue University, and the USEPA, as well as several individuals from the foundry industry contributed to this effort. The goal for the foundry industry was to show that foundry sands could be recycled and safely used in these types of applications. Ultimately, the research showed that foundry sands from iron, steel, and aluminum foundries could be used safely as a growing medium without causing harm to the environment or human health. The study is one of the most comprehensive studies used to evaluate the beneficial use of an industrial by-product, and upon its publication and subsequent peer review, helped to build the case for using recycled foundry sands in land applied applications.[16] Photographs of successful beneficial reuse applications are provided in Figs. 1 and 2.

Figure 1. Example: Beneficial reuse of foundry sand on the Ohio Turnpike Project. (Photo courtesy of Kurtz Bros., Inc.)

Figure 2. Example: Beneficial reuse of foundry sand on the Ohio Turnpike Project: (Photo courtesy of Kurtz Bros., Inc.)

BUILDING THE NETWORK

Much of the success regarding the beneficial use of foundry sand came from the building of relationships between the foundry industry, regulators, end-users, universities, researchers, and federal and state agencies. Both Paul Ruesch and Susan Mooney from USEPA Region 5 were very collaborative, and eager to learn more about the foundry process during our many discussions. Without them, I doubt as much progress would have been made to overcome many of the negative perceptions about foundries and foundry sands' potential for reuse. To make progress on recycling industrial by-products, it was critical to connect various segments of the business community and do so on a personal level.

The understanding of the opportunity combined with the building of trust were key elements to opening avenues for this material to be welcomed as a viable and safe aggregate. The transfer of technical information took place at a multitude of meetings and conferences, many of which were organized by AFS and FIRST (Foundry Industry Recycling Starts Today). Multiple resources of technical meetings and publications exist.[17,18] FIRST was a nonprofit 501(c)(3) with a primary mission to promote environmentally responsible beneficial use of foundry sands. Volunteers made up a majority of those participating on behalf of the industry. Both technical and social interaction helped to expand the building of the bonds of trust that would eventually allow a collection of individuals to share information openly.

The vast majority of those that participated in this progress could safely be labeled as optimists. While there were points in time where some questioned the possibility that these materials would be able to be readily utilized, the overarching sentiment was that these materials were a prime example of something that should be repurposed and kept out of landfills. I firmly believe the optimism

permeating the work group was a significant reason that the gains in acceptance of these materials were made. We as a group were determined and resilient.

PERSONAL RESILIENCE–MY STORY

Resilience has been defined as positive adaptation despite adversity. In life, we are often met with challenges that initially limit our potential to be successful. Part of overcoming any challenge is to survive a single moment, be it a day, a week, or a month, to rebuild upon what is not working and find a new path. Maintaining a cheerful outlook when things are not going particularly well can be challenging, even for the most positive and optimistic person. I ultimately learned that success and failure were simply time-based. If I quit before success, I failed. If I kept going after initial failure, the failures were simply setbacks. Over time, I began to look at failures simply as setbacks that usually could be overcome with time, effort, and creating new angles. This approach was key in building my own confidence to take on and overcome the next challenge.

In 1915, American writer Elbert Hubbard coined the phrase, “When life gives you lemons, make lemonade.” This simple analogy is emblematic to the person that has a set of negative circumstances thrown upon them still finds a way to be successful. I believe that everyone will have opportunities to be resilient in both their work and personal lives, and the true measure of success is not what you do when things are good, but how you respond when things are challenging.

My mother, Rosemary, contracted rubella, better known as the German measles, during her pregnancy with me in 1964. As a result of this disease, I was born with virtually no hearing capability in my left ear. During the last major rubella epidemic in the United States from 1964 to 1965, an estimated 12.5 million people were infected by rubella, 11,000 pregnant women lost their babies, 2,100 newborns died, and 20,000 babies were born with congenital rubella syndrome (CRS).[19]

Medically, the only thing that I am certain impacted me from CRS was that it impacted my ability to hear. My parents did not discover my hearing loss until I was about three years old. Physicians that evaluated me as a small child told my parents that I would adapt to my disability. They were correct. I believe that the primary reason I was able to adapt initially was the direct result of support from my parents.

Hearing loss, as I have come to learn, is a significant disability, but I remember finding ways to adapt, even as a young child. I suppose that some that were less optimistic would have problems navigating with what most would consider a significant disability. To provide some context, I grew up in a house of nine people, seven siblings and two parents. It was a noisy household. We had one bathroom, so we had to get along and respect each other. That line of respect was blurred a little when it came to noise. I recall many times that my siblings, and occasionally my dad would complain about it being too noisy to sleep. When you are deaf in one ear, based upon my own personal experience, it is not a problem. If it was noisy when I was trying to sleep, I simply rolled over on my good ear and the noise went away.

As I entered my adolescent years, my father told me that if one served in the military, they had to get a physical to make sure they were physically able to serve. My dad and I had a brief conversation one day when I was about 12 years old where he shared just a few things about his time in the military. He was reluctant to overshare regarding his experiences, but I gained enough from that conversation to know it had a big impact on him. My father, a WWII veteran, flew thirty-five missions in a B-17 as a member of the Eighth Airforce. The Mighty Eighth endured more casualties than any other command in WWII, losing over 26,000 men and 28,000 Prisoners of War.[20] As such, dad knew many of the horrors that combat veterans endured, including losing close friends and family members as he did during the war. He also knew that when the war was over, the haunting memories of the worst times of his life would remain. He told me this was the worst job he ever had. My dad also took the time to explain to me that because of my deafness, I would not be able to pass the physical. He told me that this was not something to be ashamed of, but he was comforted by the fact that at least one of his five sons would not ever have to endure the horrors of combat. Photographs of my dad during his service in WWII are provided in Figures 3 and 4.

Figure 3. First combat crew of B-17, 5-Grand. Bombardier, James H. Lenahan is pictured bottom row, lower left. (Photo is courtesy of the Lenahan family private collection.)

Figure 4. Bombardier, James H. Lenahan adds the names of the crew of 5-Grand on repaired tail section of B-17, 5-Grand. (Photo is courtesy of the Lenahan family private collection.)

Near the end of my dad's life, he was unable to speak because of a medical procedure required to assist his breathing. He was extraordinarily frustrated with his inability to speak with the doctors, nurses, and especially our family. It was at this time that I realized I was extremely proficient at reading lips. I simply asked him to act as if he was speaking, and I was able to read his lips and thus, understand and translate to others. This provided a great measure of comfort to him, and to the rest of my family during some otherwise dark days. Unknowingly, my disability had ultimately become a measure of comfort, and I would argue a gift in adding dignity and peace to his final months of life.

Through this and several other life experiences, I learned that there were ways to reframe my disability and work my way around my physical shortfalls. I believe having to work through these issues became a natural way to cultivate and advance my optimistic tendencies. Interestingly, there is scientific research that shows that individuals with hearing impairment often have psychological benefits from their disability.[21] This was not a conscious approach in my youth, but something I have reflected on since then, and recognize these seeds of optimism and resilience continued to grow in me. Ultimately, I believe many of these early-life personal lessons transferred over into my professional life. As a young boy and as an adult, if I honestly look back, I can detect a constant pattern. I was and am exclusively a "glass is half-full person." I don't often see obstacles as an impediment to success. Rather, my tendency is to reframe things as a puzzle that just needs a bit of creative thinking to find a new path or a new advantage. Much in the way I navigated through the initial processing and understanding of my hearing loss, I would navigate future challenges. Thanks to my parents, I never was allowed to wallow in self-pity in my formative years. This approach simply became part of who I became and helped cast the mold relative to my personal life and career. A photo of my parents, James and Rosemary Lenahan is provided in Figure 5.

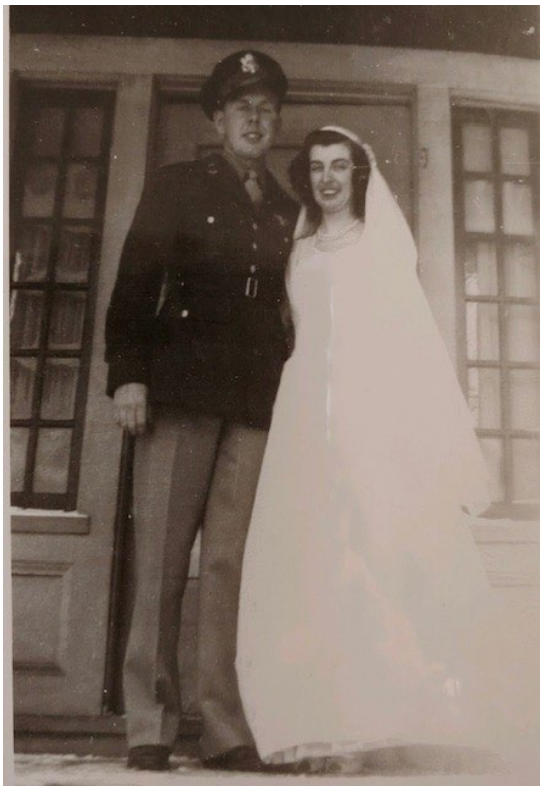

Figure 5. Photo of James H. and Rosemary C. Lenahan on their wedding day in 1944. (Photo is courtesy of the Lenahan family private collection.)

SUPPORT NETWORK AND RECIPROCITY

In addition to optimism and resilience, one of the more obvious traits I have seen in many successful people is a drive to give back to others, especially in the form of emotional support. In the Bible, Luke (12:48) states; "To whom much is given, much will be required." I am a firm believer that those of us that have been given support, wealth, time, love, and talent, should find a way to pay it forward for the benefit of others.

I believe that giving back endears us to others, and as a result, it cyclically reinforces, magnifies, and solidifies one's own network of support. It is difficult to argue that positive energy given does not result in reciprocal positive energy received, even scientifically. Daniel Oman's Hoyt Lecture cited Newton's third law, where every force (action) in nature creates an opposite and equal reaction.[22] Based upon this, and personal observation, I would suggest that the added benefit of being a supportive person is that you will benefit from the satisfaction of giving, but also will gain support from others that wish to support you. If I have learned anything over the course of my career, it is that only in the rarest of circumstances does anyone succeed without the help of others.

CONCLUSIONS

Over the course of a career and in life, there are many things to be learned. People clearly can benefit from facing challenges and subsequently overcoming them. However, to take full advantage of the impact of challenges, it is incumbent that people pause and take the time to reflect. One must look for these learning opportunities to take advantage of their full value. Mining these treasures and finding the take-away, in even a moment of moderate difficulty, is an opportunity to extract immense value from what may seem like a simple snapshot event in one's life. Ultimately, overcoming these types of challenges can be extremely emotionally rewarding.

I believe that reflection on the things that have shaped us throughout the course of our lives is a worthwhile exercise. Everyone has their own life lessons from which they can extract value. I would argue that most people have had to overcome some significant challenge over the course of their lives, and while some may seem ordinary, in total, they can have a profound impact on how we live and how we positively shape the lives of others.

Preparing for this lecture has been humbling. I appreciate that this preparation allowed me to further reflect upon my life and how the path I took impacted my own career choices, successes, and failures. Admittedly, introspective thought can be uncomfortable, but it also can be extremely rewarding.

I found sustained success and happiness in my career because of three major reasons. First, I was nurtured by loving and encouraging parents as a child. I learned early on that I could adapt, and subsequently overcome challenges. The second reason is that I was fortunate enough to be connected to people that supported me in whatever I did, obviously starting with my parents, and continuing with friends, teachers, coaches, and colleagues. I believe that one of the reasons I received that support is because I was appreciative of that support, and even more importantly, I articulated that appreciation throughout my life. I clearly recognized that support was important. I knew I was not alone in wanting to be successful. Others were pulling for me. Third, I surrounded myself with good people at every opportunity. Because of this, I was able to expand my network and at the same time, continue to learn from the experiences of others. One of my favorite quotes to this day is: "If I have seen further, it is because I have stood on the shoulders of giants." This quote is attributed to Sir Isaac Newton. To this day, I continue to learn, and garner remarkable support from them.

Finding success in recycling foundry sands was not easy. There were far more failures than successes. There were far more rejections of the materials in certain applications because of a general skepticism and bias toward an industrial by-product. To achieve some measure of success, it was mandatory to look at the glass as half-full. It was mandatory that one find another path if the path one was on was a dead end. So many individuals have contributed to the success of the beneficial use of foundry sand. The cross-section of individuals who have made contributions from both the private and public sector is vast. AFS and the AFS Environmental, Health & Safety (EHS) community played a particularly significant collective role in breaking down the barriers of reuse. A common thread that all have shared in achieving that success is a resilience, optimism, and an unquenchable desire to succeed and never give up.

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