Historical perspectives of The American Association for Thoracic Surgery: John Anton Waldhausen (1929-2012)

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John Anton Waldhausen (Figure 1), the 72nd president of The American Association for Thoracic Surgery (AATS), served as president during the 75th year of the Association. His presidential address, “The Association at Seventy-Five: The Challenge of the Future (Do We Need a Stress Test?),”¹ highlighted the achievements of the members of the Association and emphasized how “vital the Association and its members were to the development of the field of thoracic surgery” but also conveyed Waldhausen’s concern that cardiothoracic surgery had “lost its way.” “I merely wish to emphasize the point that, in its 75 years, the history of this Association has been the history of cardiothoracic surgery. . . . In my own mind, this represents one of the most glorious chapters in the history of medicine.” Waldhausen was keenly aware of the history of surgery in the United States, the importance of the AATS and its leaders in the history of cardiothoracic surgery, and the need for the Association to re-establish its leadership role in patient care, education, and research, ideals that would be central throughout his career.

Born to German parents in New York City in 1929, he was a US citizen. He was born into an aristocratic and distinguished German family, a fact he was quite proud of. His autobiography, *Finding Home in a World at War 1929-1963*,² written in 2005 as a letter to his 3 sons, documents the Waldhausen family genealogy and recounts the events of his youth and early adulthood that would shape his professional and personal life. At the age of 10, after Hitler’s invasion of Poland and on the eve of World War II, he returned with his parents to Germany. In 1944, as a patriotic 15 year old, he was sent to the Western Front as a front helper to dig foxholes and tank traps behind the battle lines near the Belgium border. He grew up then in a blighted, war-torn Germany, a far cry from the aristocratic and well-off lifestyle he had previously known. As a US citizen in Germany, he was ordered by the US consulate to return to the United States. He wanted to first finish his

John Anton Waldhausen

FIGURE 1. John Anton Waldhausen, John W. Oswald Professor of Surgery and Chair of the Department of Surgery, Penn State University College of Medicine, Milton Hershey Medical Center. (Courtesy of the Department of Surgery, Penn State University College of Medicine.)

high school years in Germany and pass the Abitur (the final examination allowing a student to enter a university) before returning to the United States. To expedite the completion of his high school training, he raised money to hire a tutor by selling his prized Märklin electric train set, given to him by his grandmother, to a Belgian soldier for 900 cigarettes, which he then used to barter for his education. This event was particularly meaningful to Waldhausen. The original working title of his autobiography had been *A Train and 900 Cigarettes*, reflecting this initial investment in his education that would allow him to return to the United States and begin a new life. He finished the equivalent of high school within 3 years, passed the Abitur, and, in June 1947, he left Germany to return to a new life in the United States.

At the age of 17, he arrived in New York penniless and alone, an adolescent of German descent seeking to continue his education in post-World War II America. Monsignor Martin Werner, a Jesuit priest and US Army Chaplain from Great Falls, Montana, whom he had befriended in Germany after the war, arranged for his matriculation into the College of Great Falls, a small Catholic School in

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Montana, with a full scholarship. Waldhausen would remain friends with Werner throughout his life. In the 1980s, Werner would come to the Hershey Medical Center for treatment of his heart disease. As a student, Waldhausen found work as an orderly on the urology service at Columbus Hospital in Great Falls. It was there that he developed his interest in medicine and made the decision to become a physician. He graduated from the College of Great Falls within 3 years, magna cum laude, third in his class, with degrees in mathematics and chemistry. He was accepted to the St Louis School of Medicine in St Louis, Missouri, in 1950.

In St Louis, Waldhausen was awed by C. Rollins Hanlon, Chair of Surgery and a well-known cardiac surgeon from Johns Hopkins. "I viewed him with awe and admiration. I thought the heart surgery he performed was exciting and he became a strong stimulus to my becoming a surgeon. . . . Dr Hanlon had in particular inspired me to seek the highest standards in patient care and his influence remained with me for my entire professional life. . . . I owe him much for he introduced me to surgery and he was my early role model."² He did well in medical school, was inducted into the Alpha Omega Alpha Honor Medical Society as a junior, and graduated fourth in his class in 1954. He applied for surgical internships and asked for letters of recommendation from Hanlon and the dean of the medical school. However, despite his academic success, Waldhausen was told by the dean that he did not know him well and could not write a letter for him. "To this day I have bitter feelings over this event and since then I have tried my best to support students, residents, and later, junior faculty in their quest for advancement. I believe it is not only humane but one of the most fundamental responsibilities of a faculty member and certainly of a chairman or dean."²

The National Internship and Residency Matching Program had just been introduced, and, with the recommendation of Hanlon, Waldhausen matched into the surgical training program at Johns Hopkins Hospital, his third choice for internship in the match. He joined the 1954-1955 surgical internship class at Hopkins under Alfred Blalock (30th president of the AATS). Frank Spencer (63rd president of the AATS and future Chair of Surgery at New York University) and James Maloney (who would go on to become the first Chief of Thoracic Surgery at the UCLA Medical Center in 1955 and later became Chairman of Surgery there) were his chief residents. Waldhausen held Dr Spencer in the highest regard: "To many of us interns, Frank Spencer became a hero. . . . his leadership qualities were legendary throughout his career."² He developed a longstanding friendship and professional relationship with Spencer, and later Dr Spencer performed coronary bypass surgery on him (twice).

During his time at Hopkins, he worked in the surgical laboratory and helped to successfully bring cardiopulmonary

bypass into clinical use. His first published report came from this laboratory experience. Drs Spencer and Henry Bahnson (57th president of the AATS and future Chair of the Department of Surgery at the University of Pittsburgh) were co-authors.³ In 1957, he went to the Clinic of Surgery of the National Heart Institute, where he mentored under the tutelage of another Blalock trainee, Andrew Glenn Morrow. At that time, the open heart surgery program at the National Institutes of Health was just beginning, and, through his investigative work at the laboratory, he was able to bring an oxygenator to clinical use at the National Institutes of Health. He had hoped to return to Hopkins for a senior residency spot but this was not the case. In 1958, he received a letter from Dr Blalock indicating that he could not return to complete his residency there, an event he found devastating. Despite the disappointment, Waldhausen was heavily influenced by his time at Hopkins, and this would later influence his own training program and his views on the training of residents and mentoring of young faculty. "The Hopkins system was one in which we [the residents] were to take full responsibility during a patient's hospitalization. It is a concept that to this day I support."² Years later, Dr Blalock would confide to Waldhausen's mother-in-law at a party that he had made a mistake in not keeping Waldhausen on the Hopkins house staff.

Waldhausen obtained a residency spot at the University of Pennsylvania under renowned general surgeons I. S. Ravdin and Jonathan Rhoads; however, he was not particularly enamored with the Hospital of University of Pennsylvania residency training program, which he believed was an authoritarian program and left little to the initiative of the resident. After confiding his dissatisfaction to Dr Blalock, he received a telephone call from Glenn Morrow (presumably under clandestine instructions from Dr Blalock) who advised him to contact Harris Shumacker, the Chairman of Surgery at Indiana University in Indianapolis. Dr Shumacker had come from the Hopkins system as well, and the Indiana residency was in the Hopkins model, with a great amount of responsibility given to the residents. He managed to secure senior and chief residency positions at Indiana University. Waldhausen was impressed with the training program at Indiana, thrived in the system, and would join the faculty as a cardiac surgeon in the Department of Surgery in 1962.

As a young faculty member at Indiana he was productive both clinically and academically and was awarded a National Institutes of Health Career Development Award. He gained a reputation as a gifted technical surgeon, performing difficult cases with tremendous ease. During this time, he developed his friendship with David Nahrwold, at that time Chief Resident of the Surgery Service. Together, they developed the subclavian flap repair for the treatment of aortic coarctation, which for many years was the standard of treatment for this lesion (Figure 2).⁴

FIGURE 2. Subclavian flap turn-down technique for the repair of aortic coarctation. (Reprinted with permission from Waldhausen and Nahrwold.⁴)

With the development of the subclavian flap, the mortality rate for coarctation repair improved significantly. The use of this technique in infants and neonates would decrease the operative mortality to <4% and significantly decreased the incidence of recurrent coarctation.⁵ Waldhausen and Nahrwold developed a close friendship at Indiana and often discussed what the ultimate surgical training program and department of surgery should look like if they had the chance to build their own program.

Waldhausen remained at Indiana until 1966 when he was offered a position as Associate Professor of Surgery at the University of Pennsylvania. At that time, Julian Johnson (43rd president of the AATS) was Chief of Cardiothoracic Surgery at the Hospital of University of Pennsylvania and had initiated a cardiac service at the Children's Hospital of Philadelphia (CHOP). C. Everett Koop, the founding Chief of Surgery at CHOP (and later Surgeon General of the United States), recruited Waldhausen to develop an independent, dedicated, pediatric cardiac surgery service at CHOP. While at CHOP, Waldhausen pushed the development of open cardiac repairs in children and helped usher in the era of infant repair. By 1971, he had reported on his results with 32 infants undergoing open cardiac repair at CHOP by using a disc oxygenator and a roller pump, with an overall survival rate of 78%.⁶ He worked with William Rashkind, who introduced the balloon atrial septostomy, in the treatment of patients with transposition of the great arteries by creation of an atrial septostomy to promote intracardiac mixing before proceeding with definitive repair; a management strategy that is widely used today. Using this approach, the CHOP group was able to report in 1971 an overall operative survival rate of 81%, including

100% survival for 18 patients with simple transposition.⁷ He was known for his technical expertise, was widely recognized for his excellent results in the infant population, and developed an international reputation as one of the leaders in congenital heart surgery. In the inaugural Waldhausen Lecture given in 1995⁸ at the Hershey Medical School, he would recall that this time at CHOP "was the happiest and most productive period as a surgeon." In 1969, he received an offer to become the founding chair of surgery at the newly formed Milton Hershey Medical Center at the Pennsylvania State University College of Medicine, and Waldhausen "couldn't resist the chance to build my own program from scratch . . ."²

In 1963, the Hershey Foundation had gifted \$50 million for the development of a medical school and medical center in Hershey, Pennsylvania. In 1969, the 39-year-old Waldhausen was recruited as the founding Chair of Surgery. After a recruitment period of only 4 weeks, Waldhausen accepted the position of Professor and Chief of the Department of Surgery; a position he would hold for 25 years. His goal was to create a superior environment to foster learning, research, and patient care; what he believed were the core values of medicine. "We need a faculty with all three abilities to have a truly sound medical school: a faculty that is willing and able to teach, to do research, and to take care of patients."⁹ His first recruit was William Pierce, a young resident and researcher from Penn who, with Waldhausen's support, was instrumental in the development of the total artificial heart. Dr Pierce and his colleagues designed, fabricated, and tested implantable devices in animals and developed a commercially available ventricular assist device. By 1976, a pneumatically driven ventricular assist device had been developed in the department at Hershey and fabricated in the department's machine shop. The Penn State pneumatic total artificial heart was the first artificial heart to be approved by the Food and Drug Administration for use in the United States (1985) as a bridge-to-transplantation. At the AATS meeting in New York in 1986, the initial Penn State experience with bridge-to-transplantation was presented: 4 patients with end-stage heart disease had been bridged to heart transplantation with the Penn State device: 2 supported with a left ventricular assist device and 2 with the total artificial heart.¹⁰

Waldhausen was a true academic surgeon. His curriculum vitae lists 231 publications. He edited 4 books and wrote chapters for 40 texts. He was a fellow of most of the major surgical societies and had leadership positions in the American College of Surgeons, American College of Cardiology, American Board of Surgery, American Board of Thoracic Surgery, American Surgical Association, and Thoracic Surgery Directors Association. He stressed the importance of involvement in regional and national

organizations to those he mentored. In 1991, he was elected the 73rd president of the AATS. His presidency was the pinnacle of his career. The theme of his presidency, as well as his whole career, was characterized by the cardiothoracic surgeon as leader, educator, and researcher.

Frank Spencer recalls that during his tenure as AATS president, Waldhausen believed that cardiothoracic surgery needed a “stress test” (personal communication, July 25, 2013). Indeed, Waldhausen believed that cardiothoracic surgeons had been reduced to operating technicians and had “lost our way”¹:

We have, in part, lost our way. We are no longer fully participating, from beginning to end, in the care of our patients This has resulted in a less intellectually challenging residency, with cardiothoracic surgeons becoming intellectually narrower and the field of cardiothoracic surgery retreating from the bold frontiers that were established during the past 75 years. It has resulted in a loss of influence of cardiothoracic surgeons in the hospital, in the educational programs of our medical students and residents, and on the executive committees of our institutions. The brilliant research over the past 75 years is fading.... We have too often abdicated our responsibilities to our patients and our fellowmen....

He was, however, optimistic that cardiothoracic surgeons could “find our way back.” He believed we needed to change the resident educational programs to make them more attractive and educationally sound; enter the clinical arena on a broader scale by being involved in all aspects of patient care; develop meaningful and highly sophisticated research programs; not shrink from the responsibility to patients as physician and leaders; and participate in addressing the healthcare issues of the day. He focused his Presidency on emphasizing the challenges that faced the field and looking to the future:

However, for an association to remain viable and to fulfill its purpose, its members must not look only on the glorious past. They, particularly the younger generation, must look to the future and the challenges that face us. Yet some of us have been concerned as to whether the American cardiothoracic surgery is still attracting the best and brightest graduates of our medical schools and, indeed, what the field of thoracic and cardiac surgery is to be in the future.

To that end, in 1991, the Association, under Waldhausen, convened the “Snowbird Conference,” to which the AATS invited the leadership of sister societies, the American Board of Thoracic Surgery and the American Board of Surgery, to address these issues. This group was divided into 5 workshops, with Waldhausen chairing the resident education workshop, which raised concerns regarding residency

work hours, the length of residency training, and the quality of the resident education. He stressed the educational nature of the residency and the need to improve the educational environment, including emphasizing the basic principles of thoracic surgery rather than specific techniques. The establishment of a core curriculum for cardiothoracic surgery highlighting the basic knowledge of physiology and pathology was proposed. He was concerned about resident work hours before the days of residency work hour restrictions. The overall length of the residency training program was thought to be driving the best and brightest residents away from the field of cardiothoracic surgery. This began a dialogue between the American Board of Surgery and the American Board of Thoracic Surgery to reduce the total training time for cardiothoracic residents. Furthermore, he believed that if cardiothoracic surgery was to attract the best and brightest, not only would the training programs need to be altered but they must also be made more attractive to women.

Waldhausen remained at Hershey for the remainder of his career. In 1994, he stepped down from the Department Chair after 25 years as Chief. He became the sixth editor of *The Journal of Thoracic and Cardiovascular Surgery*, which he served from 1995 to 2000. During his reign, the *Journal* impact factor was raised to the highest ever, making it the leading journal in the field. Along with David Campbell (a trainee and currently the Chief of the Division of Cardiothoracic Surgery at Hershey), he brought the *Journal* online through the Cardiothoracic Surgery Network.¹¹ He remained on the academic faculty at Hershey as the John W. Oswald Professor of Surgery Emeritus until retiring from professional activities in 2002. He had received numerous awards throughout his career; however, perhaps the most meaningful to him, and his most coveted honor, was the Society of Scholars from Johns Hopkins University in 1994; 40 years after his internship at Hopkins, he was inducted into the Society of Scholars, one of the highest awards that University can give. Outside of medicine, he had an interest in history and literature. He was re-reading Tolstoy’s *Anna Karenina* (on his e-reader) in the days before his death. He loved classical music and German sports cars; his Porsche 944 Turbo remains in the barn at the farm in Annville. He enjoyed the outdoors and spending time at the family’s lake house in New Hampshire. After his retirement from professional activities in 2002, he became active in civic concerns and served as a member of the board of the Squam Lakes Conservation Society in New Hampshire. His *ex libris* (bookplate) (Figure 3) reflects his heritage and professional interests.

Waldhausen’s sons and his colleagues from Hershey have uniformly stated that the story of John Waldhausen and the Department of Surgery at Hershey cannot be told without mentioning Marian Trescher Waldhausen, Waldhausen’s

FIGURE 3. John A. Waldhausen's *ex libris*. In the center is the family coat of arms. His interests in repair of aortic coarctation, infant cardiac repair, and lung transplantation are represented in the drawings. The family home in Annville, Pa, where he and his wife Marian raised their 3 boys and where much of the Department of Surgery recruiting and entertaining was hosted is depicted at the top. (Courtesy of the Waldhausen family.)

wife of 54 years and the matriarch of the department. John and Marian met at Hopkins when he was an intern. Four months after their first date, he asked her to marry him. Their engagement was enthusiastically supported by Dr Blalock who knew the Treschers well. Her father, John H. Trescher, MD, was a partner of William Osler at Hopkins and shared an office with him. On Osler's retirement, Trescher acquired Osler's office desk and later passed Osler's desk to John Waldhausen. The desk was one of Waldhausen's cherished possessions and sat for many years in their home in Annville. The desk currently sits in the family's lake house in New Hampshire. On June 4, 1957, they were married in Baltimore, with Dr Frank Spencer as an attendee. Although John Waldhausen recruited the surgeons to the Department of Surgery, Marian recruited their wives and families to Hershey, Pennsylvania. John and Marian's 25 years of contributions to Penn State were acknowledged by an endowment establishing The Waldhausen Lectureship and The John A. and Marian T. Waldhausen Endowed Chairmanship. John and Marian had 3 children: John Henry Trescher Waldhausen who would attend medical School at Penn State University Hospital–Milton S. Hershey College of Medicine, complete

a residency in pediatric surgery, and is currently Chief of the Division of General and Thoracic Surgery at Seattle Children's Hospital and Professor of Surgery at the University of Washington School of Medicine; Robert Rodney Waldhausen, an architect who still lives in the Hershey area; and Anthony Gordon Scarlett Waldhausen, who helped develop the drive and control system for the Penn State total artificial heart. In their later years, John and Marian moved from their farm home in Annville because of his poor health from ischemic heart disease. He remained interested in the happenings of the Department and would speak to Bill Pierce nightly, including the day he died, asking "What's new with the department?" His beloved Marian died unexpectedly on Valentine's Day 2012.

John Anton Waldhausen died on May 15, 2012, at the age of 82, just 3 months after his wife's unexpected death. "John was an outstanding academician, leader, innovator, editor, and mentor to many and was one of the great intellects in the theory and practice of cardiothoracic surgery."¹² He will be recognized as one of the true leaders in American thoracic surgery. He had trained with the world's best and had become their equal. He left behind as his legacy an Association guided by his leadership, a nationally recognized and respected department of surgery that he had built, residents and faculty who had benefited from his mentorship and support, and, most importantly, his family. His legacy lives on in the countless patients he worked tirelessly for and in his pioneering therapies that continue to affect generations of patients. The Waldhausen legacy is quite a nice return on an initial investment of an electric train and 900 cigarettes.

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