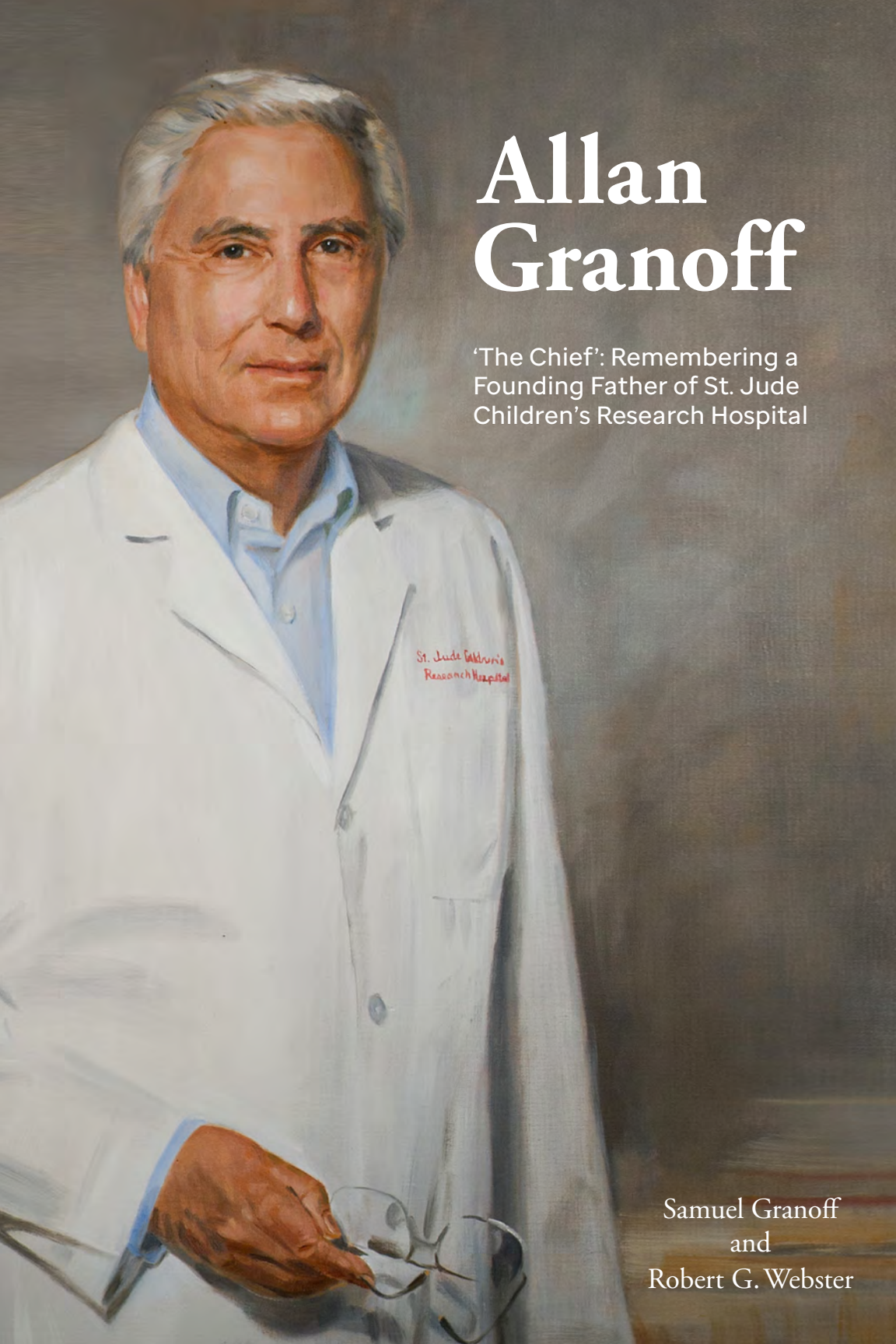

Allan Granoff

'The Chief': Remembering a Founding Father of St. Jude Children's Research Hospital

Samuel Granoff
and
Robert G. Webster

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St. Jude Children's Research Hospital

By Samuel Granoff and Robert G. Webster

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Cover: Allan Granoff's portrait hangs in the Danny Thomas Research Center at St. Jude Children's Research Hospital.

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INTRODUCTION

The loss of his young wife, Shirley, to cancer probably had a profound influence on the choices Allan Granoff made for the rest of his life. After fighting in the Battle of the Bulge in World War II, he trained as a virologist with Drs. Werner Henle and George Hirst, who were leaders in their field. Despite Allan's promise to his wife that he would not take their children to the South, he was persuaded by Dr. Donald Pinkel to take up the challenge of creating a department of virology at a new hospital being established by Danny Thomas to cure childhood cancer.

As one of the first scientists at St. Jude Children's Research Hospital, Allan was an avid believer in the mission set forth by Thomas. Allan's lasting contributions and excellent instincts helped the institution combine basic science and clinical science, in pursuit of Thomas' dream that "No child should die in the dawn of life." At St. Jude, children from all backgrounds were treated, and no family received a bill for treatment, travel, housing or food—a policy that persists to this day.

An astute administrator and gifted leader, Allan shaped the Department of Virology and Molecular Biology into a globally recognized center of virus research. His commitment not only helped local patients, but advanced scientific knowledge across the world. Allan made certain that funding was raised through grants, in an effort to ensure that all donations to St. Jude benefited its patients.

As a wonderful father, committed raconteur, advocate for equality, and dedicated scientist, Allan had the courage to stand up for what was right. He earned the admiration and respect of all who knew him. At St. Jude, he was affectionately nicknamed and will forever be remembered as "the Chief."

CHAPTER 1

Before We Were Them

> *"For my grandchildren, great grandchildren, great-great grandchildren and others in the future, I am writing an informed autobiography."* — Allan Granoff, March 2005

Just a week before Samuel Granoff's adoptive nation would join the Great War, a Connecticut military census agent arrived at his home to ask a peculiar set of mandated questions. Could he:

Ride a horse? *No.*

A motorcycle? *No.*

Understand telegraphy? *No.*

Operate a wireless? *No.*

Handle a boat, power or sail? *No.*

Have any experience with steam engines, electrical machinery, simple coastwise navigation, or high-speed marine gasoline engines? *No.*

Swim well? *No.*

He could drive an automobile and handle a team (despite his inability to ride). But more importantly, at 26 years old, Samuel was married with four dependents. He was a merchant with no experience in any other trade, occupation, or profession. His nationality was listed only as "Hebrew." He was not yet a true citizen of the United States, for citizenship was usually granted five to seven years after arrival.

A tree grown in New Haven

The Granoffs had not always been Granoffs. At the mouth of the Hudson a decade prior, and like the diaspora of so many of the eventual millions of immigrating Eastern Europeans, the Agranovskys had lost their surname to the stroke of history's pen. With it went the infinitudes of a familial past: the who's, what's, when's, where's; the ties to Jewishness, to purpose, to belonging.

The Agranovskys hailed from Starodub, one of the Russian

Empire's many cities bound by the Pale of Settlement. It is glaringly obvious why their family—along with thousands of others who arrived each day—fled their nation of origin. The Pale consisted of land dedicated to the 125-year-long residency of Jews in Western Russia. Residents were forbidden to live outside its confines (and often even within). Poverty-stricken and subject to conscription, these Jews subsisted almost exclusively on paltry profits via military service, merchant, or artisan work.

Pairing Tsar Alexander III's "fierce hatred of the Jews" with their geographic concentration led to horrific anti-Jewish pogroms, which targeted hundreds of Pale communities with unremitting violence and destruction. Settlements outside of the Pale were prohibited. The government legalized expulsions and condoned lawlessness for crimes against the Jewish people. A second wave of riots occurred between 1903–06, which the *New York Times* reported as "worse than our censor will permit to publish." Jews were taken "wholly unaware" and "slaughtered like sheep."[1]

Zalman and Leie Agranovsky escaped on the *RMS Lucania* out of Liverpool, arriving July 10, 1907, from a part of the world whose landscape was perpetually bleak, climate always frigid, and people forever hungry. The ship would later be renamed the *RMS Lusitania*, presaging the conflict that would send a military census agent knocking on the door of Zalman's son one March morning. The couple brought along their daughters, Sone (who became known as Sophie) and Chawe (known as Eva); and their sons, Wele (turned William) and Schloima (turned Sam). The latter, at 15 years of age, would one day father a son of his own, named Allan.

In that July, with names deemed either too complicated to spell or pronounce by an immigration officer, a different sort of independence was to be celebrated—one that came every day of the year for the thousands of daily arrivals to the United States. Stepping through Ellis Island's double doors some 4,660 miles from home, six Agranovskys broke their branch off a family tree plagued by unending oppression. When they exited, the now Samuel and Lizzie Granoff were only 80 miles from their new permanent home, having lost far more than personal belongings during their journey west.

But then again, perhaps some past is better left behind.

The early years

Both Samuel and Sam worked as peddlers. They woke long before dawn to collect fresh fruits and vegetables from local farmers, then schlepped around the streets of New Haven, Connecticut, until the early afternoon fulfilling deliveries. The aptly named Granoff Produce made deliveries to restaurants, groceries, and local marts (including Mory's, made famous by Yale a cappella's "Whiffenpoof Song"). At one time or another, the wholesale business employed every boy in the family.

Not long after their arrival, young Sam fell in love with an American girl: Sophie Lettick, a native of Connecticut. The couple married August 31, 1913. After their first daughter died of rheumatic fever, Sophie and Sam went on to have four sons: Leonard, Allan, Sherman, and Matthew. Allan, the second oldest, was born in New Haven June 26, 1923, in the hottest month of the year.

Allan summed up his childhood as "uneventful."[2] He lived at 55 Brownell Street in a three-story house, due west of downtown and east of Yale. The home was also located just a block away from Edgewood Park, which was convenient for sledding in winter and hijinks in summer. Theirs was the type of neighborhood with just enough property to envision a fresh-cut front lawn or curated side garden, but never enough to actually do so. At the start of the 20th century, the town had an influx of Italian-American, Jewish, African American, and Puerto Rican immigrants.[3] Neighborly noise was common, especially when one lived downstairs. The Granoffs rented out the first floor of their residence, while Sam, Sophie, and the boys lived on the second floor. Sophie's ailing father occupied the top floor, which consisted of a small kitchen, bedroom, and bathroom.

Growing up during the Great Depression, the boys attended Roger Sherman School for their early grades, Troup Junior High School until the ninth grade, and then Hill House High School. Aside from continuing the tradition of working in the family business, the boys cultivated interests of their own. Leonard, a jazz drummer, swiftly ascended to the point of prodigy (his 1940 census profession listed him as "Drummer.") Allan enjoyed the sea-scouts and fishing. Sherman chased girls, and Matty, the youngest, was but a child. The brothers' disagreements ranged from Frankenstein to King

Kong, Cab Calloway to Benny Goodman, The Shadow to Dick Tracy. But the topic that created the firmest divide was the debate over the merits of Wooster Street pizza. Which was best: Pepe's or Sally's?

The Granoffs often traveled to Len-Al Sher, the family beach cottage on Silver Sands Beach down the Long Island Sound—riding the Flying Horses at Momauguin's Savin Rock amusement park, bowling duck pins, eating split-and-grilled hot dogs, and getting sugar highs on Italian ice. In 1941, Allan graduated and enrolled in the University of Connecticut.

Soon thereafter, he went to war.

CHAPTER 2

At War

> *"If history is no more than a springboard into a pool of remembrances, it has done its job."*
> —Perry S. Wolfe in *Fortune Favored the Brave*, foreword

Allan's seven-and-a-half-page autobiography, scrawled by the Floridian retiree on a March afternoon, contains his lengthiest wartime description, which accounts for little more than two notebook pages. Of these, the overwhelming majority of ink describes the when and where, mostly bereft of embellishment.

Even the apex of military conflict—during a winter so violently frigid, against an enemy so hopelessly aggressive that it might have worried the French of the previous century's Borodino—is described in a single sentence: "In September of 1944 we were shipped out for the war in Europe, and I carried the radio in combat until late December 1944, when we were transferred to Belgium to take part in the Battle of the Bulge—Germany's last failed offensive."[4]

No other subsequent actions are covered: no specific experiences from his trio of campaign ribbons, nor anything pertaining to his reception of the Bronze Star. There's absolutely nothing about his unit's successful linkage with Gen. George Patton's Third Army, which severed "the Bulge" and marked the turning point for Germany. Why? Maybe because that war—to Allan and to many other men of his time—was a duty to their families, their country, or their fellow man. Maybe because they knew what was right—or at least what was glaringly wrong—and when called upon to serve, it was all that could be done.

Nevertheless, Allan lived by voicing his opinion on senseless violence without speaking, as a sort of action through inaction. Behind the grinning, time-faded Brownie photographs of a skinny boy in combat fatigues, came a reality that could only be remembered in one way: experience alone.

As he entered his third semester with an undeclared (and still undecided) major at the University of Connecticut, Allan learned he had won (or lost, as you can decide) the United States military draft lottery. By an executive order one month prior, selection ages had been shifted from 21–35 to 18–37. Allan had registered on his 18th birthday two summers before, but with the implemented transition he now fell well into the range of acceptable draftees; one of 10.1 million men chosen during a single year.[5]

There's no available evidence to romanticize how he got the word—whether it was delivered to his mailbox on an overcast New Haven morning or received on a moonlit evening after a lecture. Nevertheless, Allan was called and quietly accepted, just as two of his brothers would do, already exemplifying the type of person he would become. A train took him to Ayer, Massachusetts, and from the station he was transported to the revitalized Fort Devens, where more than 1,000 buildings had been constructed as a reception center for New England servicemen.

The recruits were soon designated and dispersed into various regiments, battalions, companies and detachments, then shipped off for basic training.

April in Paris

Allan's immediate specialist assignment probably caused him and his fellow northern boys to assume they had encountered a bureaucratic mistake: They were being sent to Paris, first thing in April. Unfortunately, the humble Tennessee town of their realities had little to boast as compared with its sister across the Atlantic. Paris, Tennessee, offered early-onset heat, far fewer Nazis, and plenty of open-air space for Barrage Balloon School.

Allan's barrage balloon training group at Paris, Tennessee

From April through mid-May, Allan and his compatriots learned all there was to know about transporting, unloading, deploying and deflating zeppelin-sized behemoths. Initially introduced during the First World War, kite balloons were used as an anti-aircraft measure. The process involved hanging steel cables and netting to counter incoming dive bombers at up to 5,000 feet, forcing enemy pilots to fly back into the range of anti-aircraft weaponry.[6]

Over one-third of all of these kite balloons were deployed around London. Other smaller balloons served in similar capacities aboard ships at sea, capable of being launched to repulse aerial attacks—especially during the invasion of Normandy. The effectiveness of this operation was halted by an influx of higher-flying bomber deployments, far beyond the range of the balloons' steel ground tethers.

After a six-week stint in the Volunteer State, the Army reevaluated its plans for Allan, re-enrolling him in college—not at the University of Connecticut, but at a school to the south, in Tuscaloosa, Alabama. Aside from the town's syllables that seemed to get stuck to one's tongue, the University of Alabama had plenty to offer: Not only was there the familiar, institutionalized ease of higher education, but there was far better food (fried) and much prettier students (girls) than either Basic Training or Barrage Balloon School. It is easy to envision 19-year-old Allan, strolling in his summer service uniform under the shades of sycamores and towering oaks, leisurely bouncing from class to class, employing the kind of witticisms that would win the hearts of people for the next 70 years. But however easy to envision, Allan later summed up this scholastic experience in just a few words: "It was my undoing!"[7]

With the military bemoaning a lack of "qualified" men, all draftees with previous educational or technical experience were encouraged to apply for promotional consideration. Mechanics would become engineers and stevedores sailors. Former collegiate students were meant to transition into officer roles, in a variety of field placements. Because Allan had prior academic experience, the army decided to expedite this process by enlisting him in the second term of a three-term course.

In spite of relaxing afternoons in the Alabama shade, Allan must have had a permanently flustered look on his thin, tanned face.

After completing two not-so-successful terms, it became clear that his chance of speedily climbing military ranks was over. The Army decided to transfer him back to an infantry division. Meanwhile, individuals who had enrolled in the first term (instead of a second, like Allan) were shipped off to professional schools, to become experts in something that he, at the time, was deemed unqualified for: medicine.

Radio school

The United States Army 84th Infantry Division, nicknamed "Railsplitters," with a red and white insignia of a hatchet doing exactly that, was in training at Camp Howze, Texas. On arrival, young Allan was assigned to the First Battalion's 334th Infantry Regiment, which was in dire need of technicians.

Allan Granoff carried a SCR-300 transmitter/ receiver radio that weighed nearly half his body weight.

Unbothered by yet another bout of instruction, Allan was placed in a radio school to learn about in-field communication. It was his first scholastic success that came with a promotion, but not a glorious one. Operators such as Allan were required to carry "mobile" packs that, with additional gear, weighed roughly 60 pounds, not including a 10 pound, standard-issued M1 Garand. Remember, Allan was 5 feet 11 inches tall and weighed 125 pounds upon enlistment.

Technicians were essential to success in the field, responsible for reporting enemy locations and advancements, acknowledging troop movements, and requesting reinforcements. Allied success during the Bulge has often been attributed to the effectiveness of

radio communications. Allan likely carried the SCR-300, a battery-powered receiver/transmitter designed by Motorola. Known as the "Walkie-Talkie" for its carriers, who did exactly that, the SCR-300 was used heavily in both the European and Pacific theatres. Allan spoke fairly fluent German and learned to transmit and receive in Morse code. But if lugging an additional half of his weight through training exercises wasn't enough, Allan would soon learn why enemy sharpshooters thought of radio men as walking targets. It was a role so dangerous that, due to high mortality rates, each technician was always accompanied by an understudy.

As noted before, the brunt of Allan's military service went unmentioned in his own words. His children recall only a story or two, leaving Allan's exploits mostly unknown. To try to understand the gap between his embarkation to the United Kingdom in late September, and his incapacitating bout of frostbite nearly 16 weeks later, one must rely on what few sources remain available. In the case of the 334th Division, Corporal Perry S. Wolff and several of his fellow division men compiled a regimental history titled *Fortune Favored the Brave*. The authors preserved and recorded their struggles to give readers a chance to comprehend otherwise forgotten details (or lost, as in the 1973 National Archives fire). The only other published sources are the meticulously detailed morning reports submitted from the field by commanding officers. One must use these sources when attempting to reconstruct Allan's military service.

Over there

By early September, their entire outfit moved to a staging area at Camp Kilmer, New Jersey. Before that move, the men had

grown restless over the constant flow of rumors that spread through camp. If a senior man predicted the 334th would be no more than a replacement regiment, likely left on the sidelines, his peers would counter by declaring that they were being selected for a specialized service branch, such as the military police.

The journey back to the northeast put an end to all of that. It was clear that the 84th's time had come. Allan and the boys were granted weekend passes to New York—a place of metropolitan wonders for regimental men who hailed from all 48 states. The city teemed with "shows, women, liquor, churches: a man could say goodbye any way his experiences had taught him to act the word."[8] Allan's unit was one of the first to receive newly issued combat jackets, making the young soldiers significant figures in the eyes of a fashion-minded Manhattan crowd. The unit's final drills were coupled with these strands of youthful enjoyment, all serving as remembrances of a home to be left behind. At the Brooklyn Naval Yard on September 20, they loaded onto the *USAT Barry*, a reconverted luxury liner, and set off for England before the sun had time to fully clear the morning's haze.

Docking at Southampton October 1, 1944, the American troops disembarked while maintaining relatively high spirits. Some spirits were higher than others, for letter writing and poker were the journey's primary distractions, leaving the latter's losers already feeling lighter of pocket. One may assume that this was the abrupt end of Allan's interest in card playing. Not a man aboard had felt an inkling of danger; the weather was agreeable, the food edible, and none of the commanding personnel informed them of the "contact with numerous submarines [that] was made."[9]

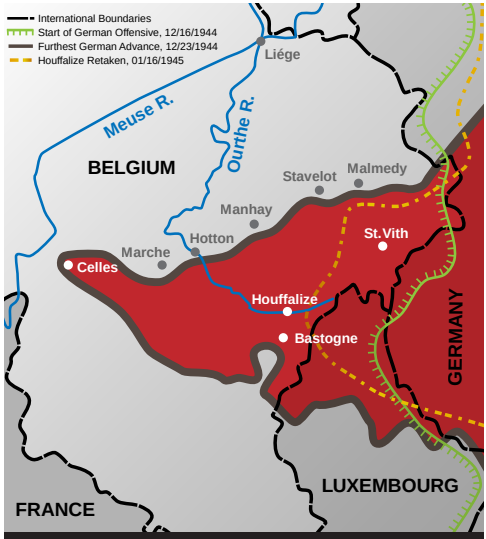
Once settled in England, however, the men encountered an unavoidable sense of wariness when interacting with their allied counterparts. The foreigners were an odd and unfamiliar lot, and American troops found it best to transition into local customs with observations and ease. They lacked the rigorous training exercises that had occurred stateside, instead taking every other evening off and spending most of their time in a city that even made New York look ordinary and sane. If the mandated Army lectures on English customs weren't enough, the young Americans briskly discovered a "weak, warm beer instead of Budweiser; pudding instead of ice cream;

and left-side driving, which left [the] Service Company in continuous apprehension."[10] Regardless, the men had a grand time in a city that may have, with its ancient cathedrals and ornate architecture, inspired Allan to begin traveling with a pen and paper close at hand for his growing interest in sketching.

A month of comfort passed much quicker in hindsight. Surely once or twice, while dug-in in the dark and frigid Ardennes, or marching in twos through battered French townships, each man found himself slipping back into the foreign yet familiar comforts of England's once reprehensible ales or questionable desserts. After landing on the mutilated shores of Omaha Beach on the first of November, still riddled with Czech hedgehogs and discarded landing craft, the members of the 334th Infantry Battalion would have to subsist on field rations and temperamental frustrations instead.

The 334th in combat

With nearby hedgerows teeming with German mines, the infantrymen were introduced to France with a 10-mile forced march to the town of Mosles. They spent three days waiting among the remnants of buildings, while the lazy sea spouted a continuous stream of allied reinforcements and supplies. Orders then came for the men to be moved along to Dreux via transport, just north of Paris. They passed through the City of Lights and around to Le Bourget Airfield—Lindbergh's post-Atlantic landing strip—where the cloud-speckled skies hummed with C47s that touched down every 30 seconds.



Map showing the deployment of Allan Granoff in World War II.

The men moved onward through Laon, and up to Wittem, Holland. On that route, from cramped truck beds under dim canvas, Allan and his unit saw the first signs of the reality of war. Towns like Carentan and Saint-Lô were as indistinguishable up close as from afar, reduced to indiscriminate piles of rubble and wreckage. Marked only by coordinates along broken roads, these towns were peppered with shell holes and abandoned enemy vehicles. A few privates declared that it looked "just like the movies," but for the 334th, "reality was only a few days away."[11]

In Corporal Wolff's own words, "the 334th never should have entered combat."[12] Germany was losing the war on every possible front by November of 1944. The Russians had repelled Hitler's traitorous advance to the east and commenced a counterattack. To the south, Mussolini's fascist regime existed on a fraction of the Italian peninsula and managed to lose ground daily. Naval blockades were in full force across the North Sea, and now the entirety of France had been liberated so that even the Maginot Line—a failed post-war French line of defense—was reclaimed. Germany's faltering army had retreated to their own defensive positions, known as the Siegfried Line (or Westwall). Constructed in the 1930s and stretching for almost 400 miles from Holland to Switzerland, the line contained more than 18,000 bunkers, tank traps, and tunnels.[13] Sections had already been penetrated, however, beginning with Achen's collapse in October. Allied armies were encroaching rapidly from the west.

Books upon books have been written debating Hitler's logic in 1944. Germany had not only been ousted militarily, economically, and technologically, but now faced formidable foes from every direction. Germany's strongest (and realistically only) ally was some 5,600 airline miles away, fighting an entirely dissimilar war in the Pacific. Even with the V-Rocket's advancements, the German infantry would have to face Allied infantry which, "stated simply, [leaves] no weapon to defeat infantry, other than stronger and more strongly supported infantry."[14]

Be that as it may, even when facing a mathematical impossibility, the Germans did not consider surrender. Whether because of elitist moralities, statistical misunderstandings, or the expectation of divine intervention, Nazi Germany insisted on fighting to the

end—more doggedly than ever, since their home soil was now at risk. The Battle of the Bulge was Germany's last major offensive. Throwing unfathomable numbers of troops and armor at unsuspecting Allied soldiers in the winter of 1944, it would become the largest and bloodiest single battle fought by the United States in World War II, and the second deadliest campaign in all of U.S. history.[15]

The Siegfried Line was the last bastion of Germany's formidable defenses. Positions were mutually supported with variants in depth, capable of shelling even the most tactically important positions on a terrain that remained "slightly undulating, offering little defilade" at best.[16] This meant that the line could not be breached through any tactical maneuver aside from sheer force.

Pressing into the German heartland

Allan was stationed with Headquarters Company which, unlike the name may seem to suggest, served right alongside Companies A through M in the field of duty. They spent a month fighting in weather that gradually descended from bad to worse, but sodden ground and unforgiving winter were the least of their concerns. By mid-November, the 84th took part in a Roer Valley offensive, pressing at the German heartland from due west. They attacked and took Geilenkirchen with support from specialist English tank divisions. Next came the town of Beeck, followed then by Lindern, which marked a struggle with the heaviest German opposition they had yet faced. As December began, they advanced on and captured Lindern, despite staunch resistance and ceaseless shelling. On the fifth of December, with enemy troops falling back, their unit advanced five miles via convoy, followed by several days of well-earned rest and recuperation. Next, they were ordered to take the countryside towns of Wurm and Mullendorf. Both were thoroughly caked in a fresh blanket of snow with rivers icing over, slowing troop movements and masking enemy pillboxes. Still, the Allies captured these objectives in the same conscientious manner. But, before having a chance to celebrate yet another coordinated victory, panic was reported from the south.[17]

An interesting thing about warfare is that, while consistent fighting almost certainly depletes many of the countless resources essential for success, it also supplies an army with an influx of hardened veterans. By the middle of December, Germany's primary fighting force consisted of a glaring dichotomy. Weary old men and near-children served alongside seasoned masters of warfare, terrifying souls who had fought and killed on three continents. In experience, these experts rivaled all except for those who were serving in their second world war.

Hitler decided to launch his daring counteroffensive in spite of his generals' counsel, emboldened by the hope that shock would force inexperienced Allied troops into a full-fledged retreat. With a "combination of Allied overconfidence, preoccupation with offensive plans, and poor aerial reconnaissance due to bad weather," the unforeseen German thrust came as their führer had anticipated. Marshal Gerd von Rundstedt threw 60 divisions against 10 American ones, continuing a relentless assault in freezing rain and blinding blizzards. The Germans often used Allied tools against them, scavenging weaponry and olive-drab uniforms. Thus, American forces were often taken completely unaware by their attackers.[18]

Members of the 84th were exhausted from their constant pressing into the German heartland—having taken five towns in two dozen days. Nevertheless, they were called to assist with the overwhelming enemy opposition entering Belgium. They departed from Beeck on December 19. When they arrived in Palenberg, Germany, they were loaded onto convoys heading almost 100 miles to a destination unknown, designated only on an Army-issued map.

The 84th set up a 360-degree perimeter around the town, later identified as Marche, in preparation for an anticipated German advancement. They were told to dig in—a task nearly rendered impossible by the ground frozen solid—and labored to create formidable foxholes throughout the icy night. Meanwhile, several skirmishes took place with German advance parties.

By the morning of December 22, without a full-blown enemy push, the men were set again to improve upon their fortifications, placing hundreds of mines throughout the forest

and fortifying whatever buildings still stood. That afternoon, in defense of the city, Allan received his first treatment for frostbite of the legs and feet.[19]

Felled by frostbite

By Christmas Eve, he was back on the front lines. The 84th continued to repel German attacks, fighting through the holidays to recapture Verdenne at year's end. As January began, they took Beffe and Devantave, with the German infantry now on their heels. To continue on the offensive, the 334th was transported to attack and seize the town of La Roche, with their success effectively marking a reduction of the Bulge, linking with Patton's Third Army at Houffalize on January 15.

The army then granted the men five days of rest, to restock supplies that had been limited by choices of ammunition and gasoline over thicker winter clothing and delays by impassable road conditions. Although this respite kept the men away from violent fighting, it also led to an influx of cold-related injuries, which probably occurred due to a lack of adequate supplies, exhaustive immobility, and ample time to become aware of wounds previously sustained.

As temperatures hovered well below freezing for the umpteenth consecutive day, TEC5 Corporal Allan Granoff was moved to a casualty clearing station. Because of frostbite in both feet, he was transferred for evacuation to Spa, Belgium. He was 21 years old and roughly 3,650 miles from home.

Recovery in Paris

Back in a Paris that had many barrage balloons but far more Parisians, Allan rested and recovered. His feet had initially swollen into two black clumps, devoid of life and scarcely recognizable

beneath his combat boots. Thanks to good medical care, he was walking within two months, avoiding the amputations that plagued many other survivors of frostbite. By the time of his complete recovery, the United States' 84th Infantry Division had helped repel Hitler's winter advancement and was crossing the Roer River. They continued their string of successes through VE-Day, crossing beyond the Rhine to halt at the Elbe and await Soviet contact.

Meanwhile, Allan's story enters another stretch of grey. Between his recovery in February and March of 1945, and his European departure January 12, 1946 (exactly three years since his military induction), Allan manned various soldierly posts, of which only a few are known. He was initially discharged to a replacement depot but, with his German fluency, found himself guarding a P.O.W. camp back in Germany. As for the remaining photographs of a wide grinned, goggle-donning Allan on a motorbike, or the saluting Allan in his pea coat and infantry cap, the moments are left to our imagination. He eventually boarded a liberty ship bound to the United States and, in somewhat of a roundabout manner, found himself back in the cold comforts of New England, mustering out as a member of Company B of the 253rd Engineer Combat Battalion.

Three stories arose as part of Allan's war discussions. The first two were once supplied orally and the third recorded in his brief autobiography, but none was told with exceptional historical detail or literary fervor. So, once again, much must be presumed.

As mentioned, Allan had two brothers who served in Europe, leaving their family's youngest, Matthew, at home. Lenny, his elder, was a sergeant in a supply company. Sherman, the second youngest, was a sergeant in an artillery unit. Somewhere and sometime, while marching with the 334th through the indescribably battered municipalities along the former Western Front, a nasal, high-pitched voice screamed out, "Allan! Allan!" from a broken window in one of the few homes still standing. Allan immediately recognized his younger brother's distinctive voice, but before he could reply, Sherman nearly fell out of the window in excitement. The chance of their units happening upon one another is unfathomable, and yet it occurred more than once.

Allan also told the story of being stuck in a trench, bogged down by enemy fire and the weight of his radio pack, in serious need of directions. The only man within earshot was stuck in a crouch some 10 yards forward, holding a position where the trenches bisected. Allan approached, asked the man for directions back toward HQ company, and his ally responded by confidently pointing to the left. He thanked the man, received no response, and moved onward. With shots still ringing overhead, scraping bark and clanging off parapets, Allan repositioned himself against the wall and hustled several hundred yards to safety. He slowed to catch his breath only at the end of the trench line, hoping to remain composed in front of his superiors. In the brief moment of silence from the rustling of his packs, Allan heard not English but German being spoken all around him. He listened no longer than he needed to be certain, and immediately pivoted in place, sprinting back the way he had come. When coming to reprimand the soldier who sent him forward, he realized his words would only fall upon deaf ears—literally, as the man in question had been completely deafened by shellfire.

Lastly, Allan wrote about one other memory of chance. His best friend from high school, Bernie Matlaw, served in the Pacific Theatre. Although they had both promised to write, reaching one another from the polar Ardennes to the sweltering Pacific was no easy feat, so neither heard much aside from familial gossip. When Allan finished stamping his thumbs and signing his name, receiving a third of his military payment in the form of a $100 check, he stepped into the evening as a free man yet again. A light snow was falling, joining the piles of other not-so-light snowfalls that had crowded the streets. Down the road, illuminated only by spherical lamplight, came a soldier bundled in more layers than necessary, toppling under an army-issued great coat.

"Surprise, surprise!" said the man from afar, his brisk walk turning into a steady trot. Allan squinted through the flurries to see Bernie Matlaw's unforgettable grin, arms wide for embrace. Bernie, returning from the Far East on a much different schedule, had somehow had his discharge aligned on the exact same date and place: January 29, 1946, in Ft. Devins, Massachusetts.

Allan, part of a military division that was supposed to never see combat, was once equally responsible for attacking with such intensity that it led a captured German officer to say: "We had been told that we were to be attacked by green troops, and we thought it would be easy. I have fought in Africa and Russia, and have never seen soldiers attack with the ferocity of your division."

So what does a 20-something year old—who has traveled halfway across the world, been fired at and shelled upon, marched through several countries and back again, eaten slop from questionable tins, shaved and drank out of his upturned helmet, lost many friends but gained many more, showered less often than he'd care to admit, froze both feet nearly off, learned enough French to get by, trained with balloons and doctors and radios, mastered the art of sleeping anywhere at any time, and borne witness to the horrors of modern war firsthand—supposed to do right when he returns home? Immediately return to his studies, to pretend nothing out of the ordinary happened?

Not exactly.

CHAPTER 3

Post War: Pre-St. Jude

"Al, I am so proud of you. You have come such a long way, and what you are doing is so good for the rest of us. It is very difficult for you, I realize, and sincerely sympathize; however, your true 'Railsplitter' training comes to the forefront and you are as brave as you were in combat."

—Tom, member of 84th Infantry Division,
in a January 1965 letter to Allan

Allan re-entered civilian life back in New Haven. An opportunity arose for a speedy return to the University of Connecticut, to continue his studies with the start of that spring semester, but he decided otherwise. After all, he had rightfully "earned a vacation," and he chose to put off his return to academia until the fall. For the spring and summer of 1946, freed of all scholastic and military burdens, Allan got the chance to live like the youth he was, "goofing off and collecting unemployment compensation, which back then was $20 a week."[21]

Come September, after plenty of well-deserved R&R, Allan returned to the University of Connecticut and was forced to decide his major. After two "extremely interesting" psychology courses, it only took one in bacteriology to win his heart. He graduated with an Honors B.S. in 1948.

But studying bacteria wasn't his only focus. At school, Allan met and quickly fell in love with Shirley Pollock, an English major with dark features who always smiled in photographs. They married just after graduation, on Allan's birthday in June of 1948, and enjoyed a brief honeymoon on the Mississippi Gulf Coast.

Upon return to the real world in Philadelphia, Shirley found work in secretarial school and Allan started a master's program at the University of Pennsylvania. He studied viruses under Dr. Werner Henle, a German-American virologist who worked closely with his wife, Dr. Gertrude Henle, both known for discovering

an immunization for hepatitis, working on the flu vaccine, and developing a test for mumps. [22] Allan received his M.S. the following year and decided he had "had enough of schooling."[23]

The couple returned to New Haven, where Allan found work with Peerless Hosiery on Congress Avenue—the wholesale clothing company of Shirley's father, Irving Pollock. As a traveling salesman, Allan was given turf in Upper New York, knocking on doors from Utica to Rochester, employing his charm on countless mothers and grandmothers. But after three months, he decided "the salesman career was not for me."[24] Luckily, Dr. Henle had told Allan he could return to mentorship at the university. After Allan's quick phone call admitting defeat, his former thesis adviser replied with one word: "Fine." Shirley was to stay in New Haven, and, for the first time, the couple would brave the challenge of a long-distance relationship. Allan packed his things and took a morning train back to Philadelphia, missing his new wife all the way.

On the steps of the 30th Street Station, waiting for a trolley, Allan got a different kind of "cold feet" than those in the Ardennes. After further deliberation, he hopped back on the next train to New Haven. He called Dr. Henle upon arrival, making up a story that he "couldn't come in because [his] father-in-law was ill." Whether aware of the impromptu lie or not, the doctor's friendly response was that Allan "would always be welcomed back, whenever."[25]

Encouraged and enlivened, Allan re-embraced the life of a traveling salesman, going home to home across the Northeast. But, after a few more miserable months, it was quite clear that school was the best option. On his second try, Allan found an apartment, enrolled, and began conducting research with Dr. Henle. After over a year of visitation and romantic correspondence, Shirley moved to Philadelphia. In 1952, Allan completed his doctorate in virology/immunology. He was offered a position to continue with Dr. Henle, but decided instead to move to New York City, to start anew.

The couple found an apartment in Stuyvesant Town, at 309 Avenue C; on the ninth floor of one of the 110 red-bricked, post-war apartment buildings in East Village. Not only was apartment 9H across the street from work, but it had great views of the East River and Brooklyn. The neon glow of Hydrox Cookie Bakery's illuminated

sign glowed across the way. Their place bordered the busy roadway of East River Drive, where dignitaries drove to and from the United Nations (including Nikita Kruschev for his famous shoe-banging incident). Shirley returned to secretarial school which, unlike her husband's short commute, required three bus transfers. Allan worked at the New York Public Health Research Institute under George Hirst, the founding editor-in-chief of *Virology*, who would later be described by *The New York Times* as the pioneer of molecular biology.[26]

Shirley was diagnosed with breast cancer in the late 1950s. The long and terrible battle included many comparatively primitive treatments (including a radical mastectomy). When she died in November of 1961, James "Jimmy" was 7, Barbara was 5, and David was 3. The kids were picked up by their Uncle Lenny and Aunt Shirley, taken to their grandmother's house in New Haven, and sat down by their father in an upstairs bedroom with the explanation: "God has taken your mother."

Shirley Granoff (nee Pollock) holding son Jimmy.
Shirley died of breast cancer in November 1961, leaving her husband, as well as three children—Jimmy, 7 years; Barbara, 5 years; and David, 3 years.

CHAPTER 4

Recruitment to St. Jude

Meanwhile, Dr. Donald Pinkel, the first director of the new St. Jude Children's Research Hospital in Memphis, Tennessee, was seeking a first-class virologist to establish a virology department. Renalto Dulbecco, the Nobel laureate from Cal Tech, was familiar with Allan's pioneering work on animal virus genetics at the University of Pennsylvania. Dulbecco and George Hirst of the Public Health Research Institute in New York strongly recommended Allan for the position at St. Jude. In the early 1960s, the leading theory on the cause of cancer was viruses, so Pinkel saw Allan as an ideal candidate to establish a department to study the role of viruses as causative agents of cancer.

Pinkel knew about adversity, for as a pediatrician in the Army Medical Corps in Massachusetts he had contracted polio in 1954. Self-described as a stubborn person who had won a near-death battle with disease, Pinkel refused to take "no" for an answer.

At first, Allan responded that he was not interested because he understood "the public schools were poor."[27] His boss at the New York Public Health Research Institute told the young widower, however, that he should leave New York to "provide a more suitable place for the kids to grow up."[28] At the time, Jimmy, in second grade, was walking to Public School 61 by himself. He and Barbara shared bunk beds in the same room as David's crib. Pinkel spent additional hours on the phone trying to convince Allan to visit Memphis. Although his virus research afforded a number of other job opportunities from coast to coast, Allan finally agreed to travel down later that year and see for himself.

After his first trip to St. Jude, Allan still had many reservations, but he also saw the position as a challenge and an opportunity.[29] It is unclear when Allan met actor, comedian and hospital founder Danny Thomas, but one can assume that once they shared a couple of jokes the deal was done.

The concept of putting basic research and clinical research in juxtaposition so that physicians interact with scientists was quite novel. Another consideration that was important to Allan was that

St. Jude announces the appointment of Allan Granoff.

Distributed bi-weekly on payday.

ST JUDE JOURNAL

PERSONNEL BULLETIN OF ST JUDE HOSPITAL MEMPHIS

May 17, 1962
VOLUME I
Number 11

DR. GRANOFF HERE

A noted virologist, Dr. Allan Granoff has been appointed associate professor of microbiology at St. Jude Hospital and UT Medical Units.

Widely recognized in scientific fields, he has been with the division of infectious diseases of the Public Health Research Institute in New York since 1952.

This week he is at the hospital making preparations for his move to Memphis this summer.

CLINIC OPEN TWO DAYS

Modest beginnings are changing to magnified benefits for outpatients. Now Tuesdays and Fridays are clinic days.

THEY LAID THEIR EYES ON ST. JUDE HOSPITAL

The guest registration book at the information desk tells its own story. Visitors who registered represent thirty-four of our fifty United States.

Lebanon, France, Poland and Nicaragua are foreign countries whose citizens came to see St. Jude Hospital since it opened.

Jean-Claude Winckler, the young diplomat ranking second only to the ambassador at the French embassy in Washington, was the latest distinguished visitor. The guest of Mrs. John T. Dwyer, president of The Ladies of St. Jude, Mr. Winckler toured the hospital Saturday.

St. Jude allowed absolutely no racial segregation. Indeed, the hospital was described by one of the first African American research technologists as an "oasis in the city." All races were treated in the same clinic at no cost. At that time in Memphis, separate restrooms for blacks and whites were common—but not at St. Jude.

Allan made the 1,100-mile drive from New York in a 1957 grey Ford Ranch wagon. Shirley's mother, Blanche, took care of the kids while he found a place to rent on Martha Cove. The children were then put on an airplane (for the first time ever) and greeted by their father at the other end, unknowingly arriving at a new home.

CHAPTER 5

St. Jude, Danny Thomas, and Don Pinkel

To appreciate the appeal of the mission of St. Jude to Allan, it is necessary to spend some time on the hospital's origin. Its founders were Arabic-speaking Orthodox Christians who immigrated to the United States from Lebanon and Syria. The Muzyard Yahoob family settled with nine children in Toledo, Ohio, and changed their family name to Jacobs. Their son Amos was a struggling entertainer who met the beautiful Rose Marie Cassiniti, an Italian opera singer, at the age of 14 and married her three years later.

In the midst of the Great Depression, Amos was having minimal success as an entertainer. He and his wife had one child named Margaret, or Marlo. In desperation, the young Amos turned to his faith. He entered the St. Peter and Paul Cathedral in Detroit and prayed to St. Jude Thaddeus, the patron saint of the downtrodden and hopeless.

"Help me find my place in life, and I will build a shrine where the poor and hopeless may come for comfort and aid," Amos prayed.

On a whim, Amos left his family with his parents in Toledo and went to Chicago to try to find success. He was offered a position of a standup comic in the 5100 Club at $500 per week. When it came time to advertise the show, Amos was concerned about performing in a nightclub and protecting the family name. When asked how he wanted to be billed, he thought of the names of two of his brothers—Danny and Thomas. August 12, 1940, he was billed as Danny Thomas. Abe Lastfogel of the William Morris Agency in New York saw his performance and recruited Thomas to perform on Broadway. Thomas was hugely successful in New York on stage, radio, TV, and later films. He became one of—if not the most—well-known entertainers of that time. During World War II, he entertained troops in North Africa, Europe, and the Pacific.

Back in Chicago in 1945, he was reminded of his promise. When he went to church to light a candle to thank God for his success, he found himself at the foot of the statue of St. Jude. Thomas was convinced that he must fulfill his pledge. He contacted Cardinal

Samuel Stritch, whom he knew from his days as an altar boy back in Toledo. Cardinal Stritch discouraged Thomas from building a shrine, instead suggesting that he build a hospital in Memphis. Cardinal Stritch had once served as parish priest at St. Patrick's Catholic Church in Memphis and knew the community included many underprivileged children. He also gave Thomas the names of two people in Memphis—Edward Barry and John Ford Canale—and told Thomas, "If Ed Barry takes you on, go for it; if not, get on your Arabian steed and go somewhere else."

Ed Barry took on the challenge, but the medical community in Memphis was not as enthusiastic. Le Bonheur Hospital had recently expanded its pediatric services. Lemuel Diggs, a research physician at the University of Tennessee working on leukemia and sickle cell disease, suggested a research hospital to study childhood catastrophic diseases. To raise funds for the hospital, Thomas contacted the head of the orthodox Catholic Church in the United States. Metropolitan Antony Bashir blessed the project and wrote a letter to every Orthodox Catholic parish in America urging them to support Thomas' causes.[30]

In the spring of 1957 Ed Barry asked a key question: How was the proposed new hospital to be supported? On November 1, 1957, Thomas and a group of his Arab American colleagues founded ALSAC (American Lebanese Syrian Associated Charities) to raise the necessary funds. Thomas persuaded Mike Tamer to direct this fledgling organization. Tamer, who took a year off from his tobacco and candy business to work with Thomas on fundraising, was the right person in the right place at the right time.

Raising $2.5 million to build a hospital was a daunting challenge, but with the help of Barry, Diggs, the Memphis community, and ALSAC, Thomas initially fulfilled his pledge. A star-shaped building with five wings arose in the poverty-ridden Pinch district of downtown Memphis. The hospital was situated in a slum housing area next to St. Joseph Hospital, on land designated for urban renewal. When Thomas saw the design, he called it "the star of hope."

Thomas described St. Jude Children's Research Hospital as "The dream of a Catholic, designed by a Methodist-Episcopal Negro architect, built by a firm owned by a Jew, equipped and supported by volunteer Protestants, Roman and Orthodox Catholics, Jews and

Moslems, staffed by Anglo-Saxons, Orientals, Negroes and other ethnic origins—to offer hope to the world's children regardless of race, creed, or economic status.[31]

At the November 2, 1958, groundbreaking ceremony, Thomas dramatically put a torch to a condemned house in the urban-renewal area. He ceremonially opened St. Jude Children's Research Hospital February 4, 1962.

That year, at the age of 34, Donald Paul Pinkel, MD, became the first director of St. Jude. He came from Roswell Park Medical Institute in Buffalo, New York, where he had been working on chemotherapy and childhood cancer. Pinkel spearheaded Thomas' challenge that "no child should die in the dawn of life," and, like Thomas, was a visionary who believed cancer could be cured. Pinkel was initially taken to task by the U.S. medical community for promising false hope to parents whose children had cancer. When the hospital opened in 1962, childhood leukemia was a virtual death sentence. The survival rate for acute lymphoblastic leukemia (ALL), the most common childhood cancer, was only 4%.

Pinkel knew that survival could be a struggle. After contracting polio in the Army, and following months of being paralyzed, he had been determined to walk again. He spent more than a year of rehabilitation—moving from a wheelchair to crutches to braces. It was this rehabilitation that brought him to the South. The cold, damp climate of Buffalo was not optimal for polio-weakened lungs, and he had suffered from severe pneumonia in January of 1961.

Hospital founder Danny Thomas (left) greets the hospital's first director, Don Pinkel, MD, at the unveiling of the St. Jude Thaddeus statue.

The *modus operandi* of St. Jude Children's Research

Hospital reflected the unconventional approach of Don Pinkel and Danny Thomas, including:

- All treatment would be rendered free of charge.
- Accommodation and travel would be provided free to families and patients.
- The institution would not tolerate racial or ethnic discrimination.
- Basic and clinical researchers would work together and discuss problems.
- Knowledge gained would be freely shared with the rest of the world.
- Scientists would be encouraged to pursue fundamental research into the understanding the function of normal and cancer cells.
- A triumvirate of basic research, clinical research and fundraising would cure cancer.

Some of these ideas were initially unwelcomed in the South. At St. Jude, African American physicians were treating white patients. People of all races were sharing the hospital's facilities. In spite of these breaks with local norms, Pinkel's directions were implemented in-house. When the nearby Claridge Hotel refused to accommodate African American families, Pinkel was adamant: If there are no black families, then there are no white families. The hotel agreed, provided that African American families ate in their rooms. Pinkel insisted that was inappropriate and, again, refused to use the hotel. He won out. Both African American and white families found housing and food at the Claridge. Some individuals in the local community said Pinkel was a communist. For the rest of his tenure at St. Jude, he wore red socks—and many people wondered why.

Pinkel took an unconventional approach to the treatment of ALL in children. "Total Therapy," which combined multiple anticancer drugs with high-dose radiation, was considered by many to be too risky. Yet, the 50% cure rate achieved by Total Therapy V was nothing short of miraculous. The study, published in 1972, was the first significant cure rate for cancer treatment in children or adults. For this achievement, Pinkel received the 1972 Albert Lasker Clinical Medical Research Award and multiple other international rewards and prizes.

In retrospect, it is not surprising that Allan foresaw the strengths and unique possibilities offered at St. Jude. He provided the standards expected in the basic sciences and cemented the culture of collaboration and innovation.

CHAPTER 6

Allan the Person

Pinkel was on target when he believed Allan was the right person to establish the new research department of virology at St. Jude. Allan was a people person with an innate ability to build teams who could work collaboratively and not competitively. After Allan met Danny Thomas and heard about the hospital's mission, he became a strong disciple and spent the rest of his life establishing first-class fundamental research at St. Jude.

In the mid-1960s and early 1970s, recruiting people to a new research institute in Memphis was a challenge. The assassination of Martin Luther King Jr. on April 4, 1968, at the Lorraine Motel in Memphis added to the difficulty. The response of most people being recruited was, "You have to be joking." Many assumed it would be committing scientific suicide to even think of taking a position in Memphis. Allan was a super salesman with insight into people's ability. To overcome the recruitment difficulties, he concentrated on recruiting young scientists who were beginning their careers and who appreciated the combination of basic and clinical research.

With the leading hypothesis in the early 1960s that viruses caused cancer, the proposed solution was obvious: Isolate the viruses, make a vaccine, and prevent the cancer. We now know that the cause of cancer is much more complex and does, indeed, involve a number of different viruses.

The initial studies in the Department of Virology were on Newcastle disease virus (NDV) and influenza virus. Scientists attempted to isolate viruses from cells taken from children with leukemia as well as from frogs with Lucké tumors. The study of viruses from children with leukemia and frogs with tumors is understandable, but why study NDV, which kills chickens, or influenza, and which causes respiratory infection in humans? The reason was that both NDV and influenza viruses could be grown in cell cultures and embryonated chicken eggs and could serve as model systems for obtaining fundamental information about viruses.

It was necessary to understand how a virus infects a cell, how it

takes control of the cell, replicates, assembles, releases, spreads, and causes disease. In the longer term, these studies would lead to the design of new drugs and vaccines that enhanced our understanding of the evolution of pandemic influenza viruses. Allan's research led to the discovery of a new family of viruses, ranaviruses, and to a fundamental knowledge of how viruses multiply.

In addition to his contributions to virology, Allan was a superb administrator. Not only did he recruit young scientists, but he nurtured and mentored them so that they would be the best they could be. During daily coffee breaks, Allan would "hold court" with the staff and visiting researchers. It was overheard on several occasions that those virologists were real "goof-offs" who "never seem to get any work done." Quite the contrary, as those coffee breaks cemented the group and permitted free exchange of ideas (and, of course, the latest jokes of the day). In the original design of the hospital, the doctors had their own separate dining room. The virology coffee club did not use the separate dining facility because they wanted to include the entire group of trainees, technologists, support staff and visitors in the group. The result was a sense of familial togetherness where many original ideas were shared.

The Granoff coffee club. Each morning, Allan would have an informal meeting over coffee—usually to share the latest jokes. On this occasion, Danny Thomas joined the group. The gathering included (from left) William Walker, Carol Pridgen, William Bean, Virginia Hinshaw, Helen Hogan, Danny Thomas, Robert Webster, Allen Portner, Allan Granoff, and Kathleen van Wyke.

In addition to the daily coffee breaks, Allan held a weekly meeting in his office for more formal presentations on current and future

research. At some meetings, scientists would give "run-throughs," with practice presentations of data and ideas destined for presentation at scientific meetings. These were invaluable mentoring events where both trainees and junior faculty were taught to tell a story in the classic Granoff way to present their data clearly.

One of Allan's attitudes was that everything should be easy. He was laid back in his approach to work and liked to portray himself as being lazy. In reality, the opposite was the case. He was extremely competitive and could be demanding. He expected all of his academic staff to obtain their own funding, be highly productive, and publish their work in the best virology journals. He was tough but fair. Sometimes, he would fire people who, at the end of the meeting, would agree that it had been for the best and would emerge from the meeting with smiles.

Another of Allan's traits was that he was fiscally conservative. Everyone had to earn their way and find resources to support their research. His strong opinion was that the money donated to the hospital was intended for the support of the children with cancer. Scientists had to prove their mettle by supporting themselves. He did not push to extend his department, but over time the original Department of Virology and Immunology shed the immunology component, which became a separate department. As the fundamental understanding of the molecular biology of viruses expanded, a subtitle was added, thus becoming the Department of Virology and Molecular Biology.

The theme of fiscal conservation was always noted by new staff when Allan would meet them in his ancient automobiles. When it came time for evaluations and salary increases, Allan was the master administrator: praising, if due, and reprimanding when appropriate. When it came to salary increases, he was an expert. He led staff to believe that they alone were receiving generous raises, and he asked them to keep the amounts secret. In reality, the raises were always quite modest.

One of Allan's major strengths was his inclusive attitude. He was a strong proponent of racial equality and chaired a department that fostered harmony and equal opportunity. He also participated in the "I Am a Man" march along with members of his staff to recognize the grievances of Memphis sanitation workers. This march brought

Martin Luther King Jr. to Memphis and, ultimately, to his death.

Allan's first research technologists were African Americans: Carl Johnson and Melvin Smith from Memphis. Although these young men were not trained in virology, he taught them himself, first having them observe him at the bench working with viruses. Allan taught them the tricks of sterile technique and how to work in biological safety hoods to protect themselves and the cultures. He would then put them at the bench and mentor them until they were experts. Allan provided further training in animal handling and bleeding of mice, rabbits, and frogs.

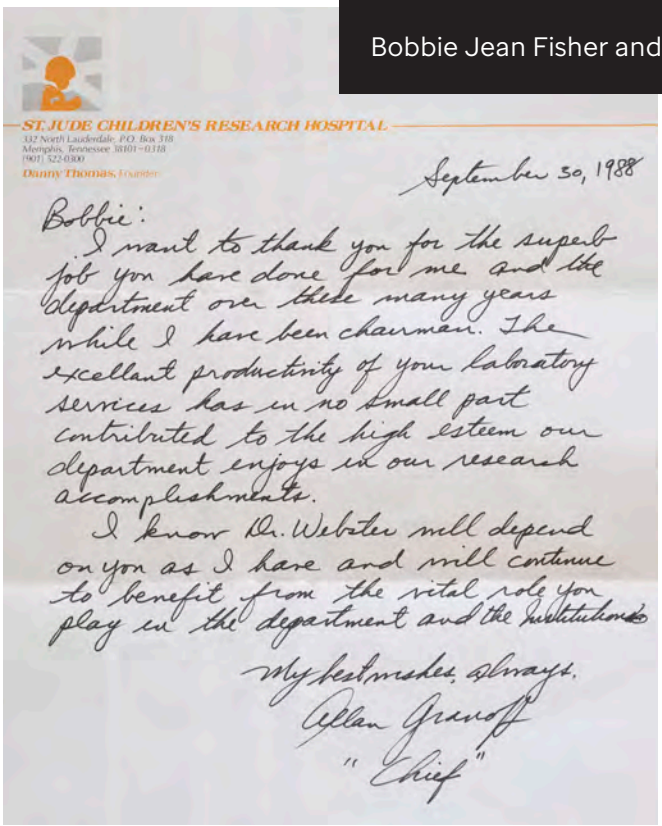
One of Allan's greatest treasures was the Humanitarian Award presented to him in 1984 by the Reverend Dr. Melvin Smith of Mt. Moriah-East Baptist Church (shown with Smith's wife, Billie Rutherford Smith).

Flexibility was always one of Allan's strengths. Some days the experiments would run late into the evening, but not on Wednesday. That was when Smith would don his other hat as pastor of the Mount Moriah-East Baptist Church. On other nights when the experiments ran late, Smith's family would bring their supper and eat with their dad in the cafeteria. The family also supervised Allan's three children while he courted his wife-to-be: Fay.

Allan not only mentored the scientific staff, but he also mentored and promoted his support staff. He frequently emphasized the importance of glassware preparation and sterilization. Human and animal cells are difficult to grow and maintain in culture, and without perfect glassware, it's impossible. Bobbie Fisher, who was considered "too black" to be in the front office of a Memphis ladies beauty salon, had been trained in laboratory glassware preparation at a local hospital. She was recruited to the Virology Department,

where she began her career collecting the glassware from the laboratories. Over the next 41 years she rose to head laboratory services—first in the Virology and Molecular

Bobbie Jean Fisher and Allan Granoff



ST. JUDE CHILDREN'S RESEARCH HOSPITAL
332 North Lauderdale, P.O. Box 318
Memphis, Tennessee 38101-0318
(901) 522-0300
Danny Thomas, Founder

September 30, 1988

Bobbie:

I want to thank you for the superb job you have done for me and the department over these many years while I have been chairman. The excellent productivity of your laboratory services has in no small part contributed to the high esteem our department enjoys in our research accomplishments.

I know Dr. Webster will depend on you as I have and will continue to benefit from the vital role you play in the department and the Institution.

My best wishes, always.

Allan Granoff
"Chief"

Biology Department and eventually in the entire institution. She was responsible for recruiting staff and visiting other organizations in Chicago, Dallas, and St. Louis to present and advise on equipment and operating procedures.

Allan did not take his work home. His relaxation was to don a Hawaiian shirt near a body of water—preferably at a beach by the

ocean, or a swimming pool—with a dry martini. His martinis were special, concocted of Bombay Sapphire gin with no more than two drops of dry vermouth. The optimal time and place to enjoy this drink was at sunset while watching for the green flash as the sun sank below the horizon. By his pool in Memphis, he would suntan in the summer and winter, always emphasizing the use of sunscreen. Despite all the sunscreen, he did develop minor facial skin cancer—perhaps from wrapping record album covers with aluminum foil for facial tanning, even in the winter.

When it came to food, Allan had rather unusual tastes. He adored tongue and liverwurst sandwiches. It's doubtful that he ate those at home, since Fay was an Orthodox Jew. The other rather different food fad was that at French restaurants he would always order escargot. Since he spent many years researching tumors in frogs, it was surprising that their legs were one of his favorite French treats. He also held the record for the number of sweet corn ears that could be eaten at a single sitting: 17.

Fay and Allan were terrific hosts and held an annual summer and winter party at their home where the entire staff was invited. The summer parties were family events at the poolside with children of St. Jude staff. The highlight of these gatherings was the live lobster flown in from New England and served straight from the boiler. One memorable summer ended less than perfect, because Allan's sons, Jimmy and David, conducted an experiment to determine whether the lobsters could still swim. The boys did not consider a pretest on one or two lobsters, and instead emptied the entire crate into the pool. When the live crustaceans hit the chlorinated freshwater, they all died. Jimmy and David realized that this was not only a failed experiment but a disaster. The now-chlorinated lobsters were returned to the cooler and—unbeknownst to guests—cooked at party time. Let's just say that the staff decided that a chlorination marinade was not the future way of preparing lobster, being far from a culinary treat. Of all the hugely successful summer parties held at the Granoffs' home, this one was remembered most by Allan and his family.

As indicated, Allan had many strengths:

- He was a shrewd administrator and a gifted leader. He built the Department of Virology and Molecular Biology from scratch at

St. Jude and shaped it into a recognized center of excellence for virus research.

- He sincerely believed in the mission of St. Jude. Allan had a deep understanding of Danny Thomas' dream that no child should die in the dawn of life. He was a trusted friend of Thomas and his family and was a continuing source of jokes for Thomas.
- Allan was fiscally conservative and had a great sense of responsibility to ensure the money raised by ALSAC (the fundraising arm of St. Jude) was spent on the children under treatment. He insisted that his staff should raise extramural funds for research in Virology.
- He was totally against racial discrimination and was never wishy-washy on this issue. He did all he could to promote affirmative action.
- He was a great family man and treated his entire staff as an extended family, encouraging everyone to do their best.

One may now ask: "Did he have any weaknesses?" or "Could he walk on water?" Well, Allan had a "naughty boy" side that was part of his persona. In talks about frogs and their viruses he would often ask, "Do you know how to sex a frog?" He would then show a slide of two identical ceramic frogs viewed from above. The next slide showed the underside of the two ceramic frogs with a male or female human genitalia. Many of Allan's jokes were rather ribald and could not be repeated in polite company.

When it came time to think deeply, Allan would take long walks by the ocean. For vacations, he and his family preferred the Gulf of Mexico at Destin, Florida. For the only sabbatical of his career, he traveled to Hawaii; in retirement, he opted for Florida and California, always with a view of that endless expanse of blue. "He lived to look at the ocean" was the opinion of those closest to him.

CHAPTER 7

Fay Granoff

Fay Granoff (née Slutsky) was a truly amazing person, for not only did she meet and fall in love with a Yankee scientist-come actor, come artist, come jokester, but she took on raising his three teenaged children. It is forever unclear where Fay and Allan met. One report was that they met in a local park when they were out walking their dogs. The dogs got along splendidly, but Fay's white poodle, Dominic, did not approve of Allan. Because the dogs got along splendidly, Allan may have had extra time to tell her some of his dog jokes.

Another family recollection was that they had been set up on a blind date, but Fay opted out by saying that she did not go out on weeknights. A short time later, Allan was at a concert with a different midweek date when he ended up sitting in front of Fay and her brother Avron Slutsky. Allan turned and said, "I thought you didn't go out on weeknights." After that, Fay had no excuses, and they began dating. Bowling was one of the activities that they both enjoyed, but she was the far better bowler.

Fay trained as a radiologist at John Gaston Hospital in Memphis and later became head of radiology at Baptist Hospital. She was a strong and independent person who liked to travel throughout the United States and explore the world beyond Memphis. Fay and her close friend, Anne Cohen Engleman, drove Fay's new Plymouth from Memphis to California and back. In the late 1950s, this was a gutsy adventure for two young women who traveled on a shoestring. The duo stayed in cheap roadside motels, one so badly bug infested that while one slept, the other stayed awake to keep the roaches off the bed. They took in the beauty of the Grand Canyon, the beaches and nightlife of California, but failed to find jobs. They returned to Memphis with the plan of earning enough to travel again. On another trip, they flew to Miami where they stayed for two weeks in the Fountainbleau hotel. They were so broke that their evening meals were the free pickles and sauerkraut that were offered at the bar.

Fay and Allan married June 27, 1965, at the home of the bride's parents, followed by a reception at the Rivermont Hotel.

From the perspective of Jimmy, Barbara and David, Fay was the perfect mother. She is described as a giving person who never bought things for herself and never treated them like stepchildren. It was many years before Nina Granoff, Fay and Allan's daughter, realized that her other siblings were her stepbrothers and stepsister. On the other hand, Fay could be as "tough as nails" and "never took flak," especially when it came to family principles and school discipline. Fay had strong southern and conservative Jewish roots; making sure the family celebrated all of the Jewish traditions and holidays including Passover Seder, with bat mitzvah for Barbara and Nina at age 12 and bar mitzvah for Jimmy and David at 13.

Fay and Allan on their wedding day, June 1965.

An incident of special note was Fay's frantic telephone call to Allan about "Patches," Allan's dog. Patches was found bloody and curled up in their yard at Martha Cove. Allan rushed home to discover that Patches had delivered puppies, and nobody had realized she was pregnant.

The Granoff family (left to right): David, Barbara, Allan, Fay, Nina, Jimmy.

As mentioned, Fay and Allan were generous hosts and

gave fabulous parties. Fay would cook for days to provide food for the entire Department of Virology. Everyone in the department was invited to these traditional Granoff bashes, which occurred triennially: mid-summer, Halloween and Christmas. The guests included all support staff, academic staff, and trainees. At the Halloween functions, everyone was expected to wear costumes and most attendees did so.

The bar at the Granoff home was a place where guests could meet many of the entertainers of that time; the walls of the bar area were covered with photographs of celebrities Allan and Fay had met and entertained. These included Danny Thomas, his wife, Rosemarie; and their children, Marlo, Terre, and Tony. Many of the Thomas family photos include Fay and Allan, since the Granoffs were frequent guests at Danny and Rosemarie's home in California. The Granoffs' bar area also featured photos of Dick Martin, Sonny and Cher, George Burns and many, many more.

At first, the Granoffs stocked their bar with almost every brand of liquor, as well as wine and beer. On one memorable occasion, one of the trainees got a little drunk. Allan was tolerant, but on Monday morning that trainee was called into "the Chief's" office and told, "Good boys do not get drunk." Allan learned not to overtempt the trainees, and in subsequent years wine and beer became the drinks of choice.

In addition to these traditional parties, Fay also hosted many of the faculty recruits and senior visiting international scientists. Soon after the international exchange with China began in the Nixon era, scientists from China visited Allan's department as a Collaborating Center for Influenza for the World Health Organization. On the first gathering for Chinese dignitaries, Fay reorganized all the furniture to accommodate extra seating. All of the TV sets were moved into Nina's room—leading the visitors to think all American children lived that way.

The hospitality Fay and Allan extended to his department fostered togetherness in the workplace. There was a sense that everyone would give their best with a sense of cooperation rather than the competition found in many other scientific groups.

CHAPTER 8

Scientific Contributions

Can human cancers be caused by viruses? In the 1960s, many scientists believed they could. The idea arose because several cancers in animals were caused by viruses, such as one form of leukemia in mice and multiple cancers in chickens. In the early 1960s, Allan became interested in using the Lucké tumor, a kidney cancer that occurs in the Northern leopard frog (*Rana pipiens*), as a model system to study the role of viruses in cancer. This animal model intrigued Allan because the tumor arose regardless of the genetic background of the frog, and also because the tumor contained virus particles that suggested a virus might have caused the tumor.

Viruses that cause cancer

Viruses are extremely small organisms made up of genes—molecules of DNA or RNA—surrounded by a protein coat. We now know of seven human cancer-causing viruses, or oncoviruses, but these had not been identified when Allan began his study of viruses as a possible cause of cancer.

Experts still don't fully understand how most known oncoviruses cause cancer, but they do know that viruses can highjack cells and insert their own DNA or RNA into the host cell and use the host cell's enzymes and architecture to form new virus particles. We know that in some cases these processes can cause the host cells to become cancerous.

Cartoon of Allan Granoff's study of frog virus 3 by Luis Borella, MD, 1975.

The virus found in frogs with kidney tumors belonged to the herpes virus family and was called Lucké herpes virus (LHV). This virus seemed to be an ideal model for studying human cancers caused by herpes or other viruses. The tumor was temperature dependent. In the cool, winter months, the frog's kidney produced virus particles that were excreted in the urine; in the warm, summer months the virus appeared to promote the development of kidney tumors.

Allan Granoff tried to isolate a virus from the Lucké tumor, a kidney cancer of frogs.

However, in spite of long and intensive efforts by Allan and his team, neither LHV nor the tumor cells could be grown in the laboratory, severely limiting the amount of material available for further studies. Also, with every passing year it became more and more difficult to secure healthy frogs from suppliers, much less tumor-bearing frogs. The reasons for this scarcity were unknown but could possibly have been attributed to climate change with warmer waters, a loss of food sources for the frogs, or contamination of their habitats.

Decision to pursue FV3 research

While trying to grow LHV in the lab, scientists serendipitously isolated a different virus (frog virus 3 or FV3) from one of the tumors. There were additional isolates, designated FV1 and FV2, but because they were isolated from normal frog kidneys rather than frog kidney tumors, they were not pursued further.

Initially, Allan thought FV3 might be involved in the development of the Lucké tumor, but later studies showed that it had no role in tumor formation and was seemingly just a bystander

that did not cause disease—even in frogs. Nevertheless, Allan and his team continued research on FV3 because it had many unusual features and was unlike other better-known DNA viruses (e.g., vaccinia virus, herpesvirus, adenovirus). One of these unique features was its highly methylated DNA genome. Another was the replication of the virus in both the nucleus and cytoplasm of the host cell. This strategy is not seen in most viruses, in which replication is limited to one compartment or the other. Furthermore, contrary to what is seen in host cells or among other viruses, FV3 messenger RNA (mRNA) was synthesized in both the nucleus and cytoplasm. Moreover, Allan and his co-workers found that FV3 mRNA lacked the poly [A] tails found on the vast majority of other animal and animal virus mRNAs. Lastly, the FV3 genome was shown to be circularly permuted and terminally redundant, a feature seen among viruses infecting bacteria, but not those infecting animals.

DNA methylation

DNA methylation became a major focus of Allan's lab because of its role in gene expression. Methylation, or the addition of a methyl chemical group (CH_3) to the cytosine portion of DNA, can change the activity of a DNA segment without changing the sequence of the bases; it is the sequence of the four DNA bases [shorthand (A, T, C, and G)] copied into mRNA that determines the sequence of amino acids, and thus the protein's nature. When located at the beginning of a gene (the promoter), DNA methylation of the C base typically acts to repress the copying of the DNA into an mRNA molecule. In the basic scheme of cellular protein synthesis, the DNA in the cell's nucleus, as well as the DNA of DNA viruses, is copied by an enzyme known as RNA polymerase into mRNA; the mRNA leaves the nucleus and goes to the cell's cytoplasm, where it is used to "translate" the sequence of nucleotides into proteins with a specific sequence of amino acids.

Although many researchers had proposed that DNA methylation might regulate gene expression, it was not until the 1980s that several studies demonstrated DNA methylation was involved not only in gene regulation but also in the production of kidney, blood, brain, and other cells from the original fertilized cell that begins

with the union of sperm and egg. It is now well recognized that DNA methylation, in concert with other regulators, is a major factor that produces changes in organisms caused by modification of gene expression (i.e., the synthesis of mRNA) rather than alteration of the genetic DNA code itself.

DNA methylation is essential for regulating tissue-specific gene expression, among many other properties. The FV3 DNA methylase enzyme, which can be easily isolated from FV3 infected cells, could be of use to investigators studying the effects of DNA methylation on the expression of genes from many species, including human.

50-plus years of FV3 research

Allan assembled a skilled group of investigators who identified and characterized a completely new family of animal viruses, called *Iridoviridae*. Between 1965, when FV3 was identified, and the late 1980s, his group defined the molecular biology of FV3 replication. Moreover, he continuously held National Cancer Institute funding for this research for over 20 years. Even today, their work stands as the best characterized example of iridovirus replication and is the model that guides current research efforts.

By the late 1980s, Allan's interests became more administrative, and the FV3 group dispersed. Interestingly, about the same time, investigators worldwide began to associate FV3-like viruses with disease outbreaks in a variety of amphibian and fish species. Ranavirus-mediated diseases have been detected among a wide variety of fish, reptiles, and amphibians. Although many ranavirus infections are geographically localized and their impact limited, infections among intensively cultured fish and amphibians can be accompanied by marked morbidity and mortality. Outbreaks among endangered species, such as the giant Chinese salamander *Andrias davidianus,* may drive threatened species to extinction. Outbreaks among largemouth bass have raised concerns among sport fisherman in the United States, as have die-offs among commercially important grouper in Southeast Asia.

The study of ranavirus gene function has identified genes directly involved in replication, such as virus-encoded DNA and RNA polymerase, the major capsid protein, etc. The study has also

pinpointed thymidine kinase and ribonucleotide reductase that are thought to enhance virus replication under restrictive conditions as well as proteins that are thought to antagonize anti-viral host immune responses. Knock-outs of the latter two classes of genes may lead to the development of attenuated vaccine strains and provide an effective approach to protect "at-risk" species. In addition, elucidating the role of ranavirus immune evasion proteins may provide comparative immunologists with insight into critical immune mechanisms that operate in fish, amphibians, and other "lower vertebrates" and may shed light on the origins of the vertebrate immune system.

Although FV3 research at St. Jude ceased by 1990, interest in ranaviruses as disease agents infecting numerous species of cold-blooded vertebrates has grown exponentially. At scientific meetings held at the San Diego Zoo (1998) and later at Arizona State University, scientists actively discussed the impact of ranavirus disease on amphibian populations. In 2011, The Global Ranavirus Consortium (GRC) was formed and held the first of its biennial meetings focused on the impact of ranaviruses and other iridoviruses on cold-blooded vertebrates.

Although much of the focus of these meetings involves viral ecology, interest remains in understanding the role of FV3 proteins in virus replication, including the role of viral proteins in evading host immune responses. A meeting point for investigators interested in ranavirus-mediated disease, the GRC has provided online training in ranavirus studies and published a monograph, "Ranaviruses: Lethal pathogens of ectothermic vertebrates" (Springer, 2015). Recent special issues of *Virology* (2017) and *Viruses* (2019) have focused on current ranavirus research. Furthermore, FV3 is used in ongoing studies designed to detect the antiviral role of innate and acquired immunity in *Xenopus laevis*, an African aquatic frog and the best characterized model of amphibian immunity.

Genetic sequencing of over 40 isolates has provided a clearer understanding of *Iridoviridae* viruses. Phylogenetic and electron microscopic studies have also shown marked genetic and morphological relatedness to other viruses termed nucleo-cytoplasmic large DNA viruses.

Clearly, the virus Allan unexpectedly detected over 50 years ago

has become the poster child of the family *Iridoviridae* and continues to serve as the model for understanding the replication of other iridoviruses and their role in diseases impacting ecologically and commercially important fish and amphibians.

Viruses and human cancer

Although ranavirus has not been shown to be related to any cancer, scientists have identified six human viruses that are linked to human cancers:

1. **Epstein-Barr virus** (EBV), a DNA herpes virus that is spread through saliva. EBV infection increases the risk of Burkitt lymphoma, some types of Hodgkin and non-Hodgkin lymphomas, and some stomach cancers (1964).
2. **Hepatitis B virus** (HBV), a small DNA virus that is spread through infected blood, semen, and other body fluids. HBV is a leading cause of liver cancer (1980s).
3. **Human T cell Lymphotropic Virus 1** (HTLV-1), an RNA retrovirus that causes leukemia and lymphoma in infected individuals (1980s).
4. **Human herpes virus 8** (HHV-8), a DNA virus that is the causative agent of Kaposi's sarcoma in people who have weakened immune systems, especially those infected with HIV-1, the RNA virus that causes AIDS (1994).
5. **Human papillomavirus** (HPV), a DNA virus that has at least 12 strains that can cause cancer in humans, including anal, cervical, penile, throat, vaginal, and vulvar cancers (1999).
6. **Hepatitis C virus** (HCV), an RNA virus that is spread through infected blood. Hepatitis C is a leading cause of liver cancer and can also cause non-Hodgkin lymphoma (2008).
7. **Merkel cell polyomavirus** (MCPyV or MCV) causes a rare and aggressive skin cancer known as Merkel cell carcinoma (2008)

In search of the Holy Grail

When scientists choose long-term research projects, they have an idea of what they believe they will discover and what the overall impact will be on the world of science. Allan thought he was selecting

a virus and a host system that was unique and promised to reveal unknown facts about the role of viruses in kidney cancer.

He and his colleagues obtained incredibly interesting basic science knowledge during the 20-plus years they studied FV3. Yet, he never found the Holy Grail he sought. Instead, he and the scientists he nurtured in his laboratory provided crucial background information that has led to an explosion of interest in ranavirus outbreaks among aquatic animals raised for food or as part of the natural world.

The worldwide occurrence of ranaviruses, coupled with the increasing trade of aquatic animals, emphasizes the importance of controlling these emerging pathogens and limiting their impact on aquaculture and endangered wildlife. What began as a quest to unravel the causes of human cancers turned into a project that may ensure adequate food supplies for future human consumption as well as the preservation of aquatic animals in the environment.

The Encyclopedia of Virology

The end of Allan's tenure as chairman of Virology and Molecular Biology in 1988 coincided with the 100th anniversary of the discovery of viruses. A century earlier, a young Russian scientist named Dimitri Ivanovsky had discovered that the infectious agent causing mosaic lesions on the leaves of tobacco plants could pass through a filter holding back bacteria. Thus, the early definition of a virus was "an infectious agent that would pass through a filter." Scientists soon discovered viruses affecting all living things, including insects, plants, animals, and bacteria. Some viruses caused diseases in their hosts, while others were benign.

When the W.B. Saunders publishing company approached Robert Webster about editing an encyclopedia of virology to commemorate the field's centennial, Webster knew just the person: Allan Granoff, of course. Allan would have time on his hands and had a vast number of contacts and friends in the field to assist in this endeavor. Allan accepted the challenge, only to discover that the director of St. Jude, Dr. Joe Simone, wanted him to serve as the hospital's deputy director. Always up to a challenge, Allan accepted the deputy directorship.

To be successful at editing an encyclopedia, one has to persuade the best virologists in their special fields to contribute. Allan's

reputation as a highly regarded virologist as well as his interpersonal skills at persuasion came to the fore. While he and Webster knew the leading animal virologists in the world, they were less knowledgeable about the leaders in insect, plant, and bacterial viruses (bacteriophages). An editorial board of 34 senior virologists covering all aspects of virology were invited as advisers, and they all accepted. The specialists suggested the viruses to be included in their areas and the authors to be contacted.

The *Encyclopedia of Virology* covered both the basic and practical aspects of virology and was aimed at a wide readership. Viruses were arranged alphabetically by their common names rather than their taxonomic names. Thus, frog virus 3, which is a member of *Iridoviridae,* appeared under F, not I. A total of 337 virologists agreed to submit short, standardized papers by a given date. However, encouraging 337 virologists to deliver on time is like herding sheep—a super-smart sheep dog is required. With the *Encyclopedia of Virology,* Allan was the star sheepdog. He herded the stragglers with polite letters about how the encyclopedia provided them an opportunity to be recognized in the company of their peers. By nipping at their heels, he ensured the publisher received all manuscripts by the drop-dead date.

The 1994 *Encyclopedia of Virology* was a success, with a second edition published in 1999 and a third in 2008. When it came to providing updated versions of their manuscripts for the second edition, there were many stragglers. If Allan was a super sheep dog with the first edition, he was the winner of the world sheep dog trials on the second edition, where he was justifiably recognized as first author.

CHAPTER 9

Master Grantsman

To be a successful scientist, one has to have the money to do the experiments and to present the results at scientific meetings. This meant writing grants to obtain the money. Allan was a master grantsman. How else would it have been possible for him to spend 20-plus years fully supported by the National Cancer Institute to research a frog virus that causes no disease or abnormalities in amphibians or other animals?

His skills at getting money for research were legendary. It is uncertain where these enviable skills originated or who taught him the secrets of grantsmanship. We presume it was self-taught by serving on multiple committees, known as study sections, at the National Cancer Institute. These committees consist of the leading scientists in a particular area of science who decide whether or not a grant proposal would receive funding. At study section meetings, Allan had a reputation of not only presenting a clear evaluation of the proposed research under review, but also starting each meeting with one of his famous jokes.

As a mentor on grantsmanship Allan was superb. He would say, "Keep it simple. Do not expect your reviewers to know the background to your proposed study."

His maxim was, "If your grandmother cannot understand your proposal, neither will many of the reviewers." He encouraged scientists to be kind to their reviewers by providing a short summary at the end of each section to outline what was being proposed and its significance in resolving the question under study. This was for the reviewer to use in a report to be presented to the entire group at the meeting.

David Kingsbury, Allan's first research recruit at St. Jude, was Allan's right-hand man in grantsmanship. Kingsbury was a taskmaster at logical development of fundamental science, and his green pen would correct and request an explanation of any flaws. Sometimes there would be more green pen comments than original text. No vague ideas or "hand-waving" about the subject was permitted.

A personal example might best illustrate the rigor of getting a grant ready for submission in Allan's department.

In the early 1970s, Robert Webster had completed the first two years of research on a grant to determine the role of neuraminidase spike on the surface of influenza plays in providing protection from infection. Influenza virus has two major glycoproteins on the surface. One of these glycoproteins attaches the virus to the cells of the respiratory tract and to red blood cells known as the hemagglutinin, which is recognized as the important component for inducing protection. The other spike is an enzyme neuraminidase, which chews the mucus off the surface of cells and allows the virus to spread.

The research question was: "What is its role in providing protection in a vaccine?"

Allan's advice at the beginning of the second year was to plan the experiments for the grant renewal and to get the draft to him and Kingsbury for comments ASAP.

The author was pleased with himself when he gave Allan the draft of the grant renewal about a month later and left for Australia to work with Graeme Laver searching for influenza viruses in migratory seabirds on the Great Barrier Reef. The morning after arriving in Canberra, the telephone rang. Allan was ranting about the grant renewal.

"This grant renewal needs a huge amount of work—get your ass on the plane and get back here," he said.

Of course, Webster was devastated, but cut the visit to Australia short to get back to the grant revision. Allan explained that Webster had not followed his maxim of keeping it simple and had not emphasized his publications from the first grant nor explained that the new grant was a logical continuation of a subject important to world health.

Kingsbury also contributed many suggestions on the logical interpretation of the proposed studies. In the short term, Webster considered that grant proposal to be the hardest work he had ever done. In the longer term, the mentorship of Allan and Kingsbury ensured that subsequent grants were continually funded for the rest of Webster's career.

Allan's expectation was that all of the research staff in his department would be supported by research grants. "St. Jude funds

are raised for the support of the children on cancer therapy" was another of his maxims. Everyone was expected to include funds for travel to attend scientific meetings either nationally or internationally. This strategy was part of Allan's skill as an administrator. It meant that the science done by each scientist in his department was top-notch, having been reviewed by the leading scientists in the United States.

During the 26 years of Allan's chairmanship of the Department of Virology and Immunology, his departmental funding from grants remained the envy of the hospital's other research departments. Colleagues who served on virology and molecular biology study sections were known to make comments like, "That has to be a St. Jude grant, for it is clearly presented and asks important questions."

Allan helped staff members such as Robert Webster (left) learn the fine art of grantsmanship.

Ultimately, it was Allan's mentorship and skills that enabled his staff to be successful at fundraising for scientific achievement.

CHAPTER 10

Field Studies on Influenza Viruses

The search for influenza viruses in the pelagic seabirds of the world was a project Allan could not resist. He had spent 10 years working with influenza viruses with George Hirst in New York, and the possibility of working on the beaches of exotic islands was too much to pass up.

He had established a strong group of investigators working on frog viruses and cancer and saw the opportunity to participate in the ongoing influenza project in his department. The big question in influenza at that time was, "Where do the viruses that cause pandemics come from?" The influenza pandemic of 1918 (known as Spanish flu) had killed 50–100 million people worldwide, and the pandemic of 1957 known as Asian flu had killed more than 1.5 million. One hypothesis was that these pandemics emerged from benign influenza virus reservoirs in lower animals by recombining with currently circulating strains.

Webster, together with his long-term colleague Graeme Laver from the John Curtin School of Medical Research in Canberra Australia, had isolated novel influenza viruses from shearwaters (mutton-birds, *Puffinus pacificus*) and lesser noddy terns (*Anous teruirostris*) nesting on the Great Barrier Reef on the coast of Queensland, Australia. These influenza viruses cause no apparent disease in the infected birds or after experimental infection of domestic chickens and ducks. Could this be the elusive reservoir of influenza viruses? World Health Organization (WHO) was interested to know if influenza viruses could be found in other aquatic bird populations around the globe.

The Guano Islands of Peru

One of the largest pelagic bird populations in the world is found on the three Chincha Islands off the coast of Peru (The Guano Islands). The bird population is dense, and since it never rains, the bird droppings build up. Over 20,000 tons of guano are harvested each year for agricultural fertilizer. Guano is a valuable commodity;

in ancient times, it was considered more valuable than gold, and anyone disturbing the birds was executed. The Chincha group are a coastal-protected preserve. The only humans living on the island are the guards. Yes, these birds have armed guards and are visited by the annual guano harvesters. No mechanical equipment that would disturb the birds is used. The guano is swept up, shoveled up, and manually carried in bags to ships. In some places, the guano can be up to a meter thick.

WHO was keen to support studies on influenza in birds on the Guano Islands, and Allan was happy to join Laver and Webster to participate in the expedition. The team needed to obtain permission and find a ship to take the group out to the islands. It would have to be a large vessel, for the Guano Islands are essentially giant rocks with vertical cliff faces in open ocean with no beaches for easy access. WHO approached the Peruvian government and obtained permission for the study. The Peruvian government also agreed to provide a large research ship that was fully staffed. This was great news, but then the St. Jude team worried about the expense. It would cost thousands of dollars per day to hire such a ship.

Allan pointed out that St. Jude did not have research funds to cover such expenses and that there was no way the team could ask the hospital for support. The team returned to WHO, explaining the predicament. Instead of canceling the expedition, WHO returned with the good news that the Peruvian government would fund the cost of the ship and staff.

The equipment for catching the birds was made in the St. Jude workshop—an extended surf-casting fishing pole with a loop at the end to drop over the bird's head. The scientists knew from experience that nesting birds are quite protective of their eggs, meaning that an individual cannot walk up and grab a bird. However, the birds do not fly away when approached with a long pole. The loop is placed over the bird's head and then tightened before the captured bird is rapidly freed from the pole.

The swabs and plastic storage vials came directly from the supplier and were packed in a laboratory that did not handle influenza virus. The other essential equipment was a large dewar—a metal vacuum flask used to store samples at low temperature in liquid nitrogen

(-196° C). The plan was to fill the liquid nitrogen tank in Lima, Peru, before joining the ship.

The three influenza hunters flew from Memphis to Lima with their collection supplies two days before departure of the research ship. They met with Peruvian Health Department officials to explain the study and were impressed with the large size of the research ship and their staff. The only difficulty was in obtaining liquid nitrogen, since a commercial company had bought the entire supply at the local depot. After explaining that the scientists only needed one tank of liquid nitrogen and that they were from WHO and had a research project with the Peruvian government, the supply company allowed the team to fill their tank.

The Chincha Islands are 21 kilometers off the coast of Peru, a relatively short cruise from the mainland. Getting there was the easy part; getting onto the island was a different matter. To reach the island, the scientists were offloaded from the research ship into a rowboat, then taken to the base of the cliff where a rope ladder hung from a derrick some 20 feet above. A strong swell was running; one moment the rope ladder was in the bottom of the dinghy, and the next it was above the scientists' heads. Climbing up a free hanging rope ladder is not easy; after some hesitation Laver grabbed the ladder and pulled himself up. Allan was quite skeptical of getting up the ladder, but he wasn't about to let those young guys outdo him. Everyone made it safely to the steep, rocky island, and the team was soon joined by guards carrying shotguns who stayed behind the group. The team had expected to find many nesting birds, but the area was quite barren. They started to wonder if this was a failed expedition.

Eventually, the scientists found a small group of about six Peruvian boobies (*Sula variegata*) nesting behind large rocks. Approaching cautiously with the catching pole, Webster managed to catch two birds before the rest took off. The first bird caught was given to Allan to hold while the second was being caught. Allan held the wings in one hand, and the large, closed beak in the other hand. Webster took a tracheal and cloacal swab and a small blood sample from the wing vein of the bird. Allan then threw the bird up into the air to release it—and plop! The bird fell on the ground dead. Allan

had held the beak so tightly that the bird could not breathe and had suffocated.

The second bird flew off after sampling, and the team wondered if that was the total sampling they would obtain on this expedition. The two guards started pointing to the top of the steep hill, and the scientists immediately assumed they were in trouble for killing the bird.

It was quite a slog getting to the top of the hill, but when they arrived, they could not believe their eyes. Birds were nesting as far as the eye could see, with nests juxtapositioned next to each other. There must have been tens of thousands of birds, and the scent was so strong that it was almost overwhelming—for guano has a unique aroma. The birds were smart and nested on the leeward side of the island (out of the wind), while the scientists had landed on the windward side. The predominant birds were Peruvian pelicans *(Pelecanus thagus),* Guanay cormorants (*Leucocarbo bougainvillii*) and Peruvian boobies. The scientists sampled birds for the rest of the day, filling all of their sample vials. Fortunately, they did not kill another bird.

On the return trip to Lima, the captain demonstrated the richness of fish in the area, dropping the main trawl net for no more than five minutes and pulling up a huge haul of anchovies. On the way back to Lima, all of the swabs were stored in the liquid nitrogen tank, and the blood was allowed to clot at the temperature of the day. Over dinner that night, the researchers celebrated the successful expedition by drinking pisco sours, the national drink of Peru. Allan decided it was a superb substitute for his dry martini. The scientists remained curious about the guards with shotguns but were mostly happy to have avoided killing any more birds.

A footnote to the visit of the Guano Islands was that Allan found he was not the only one who could be frugal with travel funds: He discovered that he would be sharing a dormitory-style room at the hotel in Lima with his two coworkers.

The Dry Tortugas

The Dry Tortugas were much more Allan's kind of destination—sandy beaches and coral reefs situated around a complex of islands 70 miles west of Key West, Florida. The largest island was the site of Fort Jefferson, a gigantic fortress built in the 1800s that protected the

main shipping route into both the Gulf of Mexico and the Mississippi River. The 420 heavy guns in the magnificent six-sided fortress never fired a single shot at an adversary. Subsequently, the fortress became a prison, and in 1935 a national monument. In 1992, President George Bush declared it a national park. The most famous prisoner held at Fort Jefferson was Dr. Samuel Mudd, who surreptitiously treated President Abraham Lincoln's assassin, John Wilkes Booth.

Allan and Webster were keen to visit the Dry Tortugas. A large nesting colony of sooty terns (*Onychoprion fuscatus*), noddy terns (*Anous stolidus*) and black noddy terns (*Anous minutus)* lived on the islands adjacent to Fort Jefferson. The interest in these birds was because they were the same kind of birds found on the Great Barrier Reef, where influenza viruses had been isolated.

After obtaining funding for the expedition from the National Institutes of Health, the team contacted The National Park Service for permission to stay at Fort Jefferson and collect samples from birds on the adjacent islands. The request was granted, and the park services provided transportation to the islands on a Coast Guard supply vessel. The park service also offered accommodation in Fort Jefferson if the team brought their own sleeping bags and food. Since accommodation was available (with easy access to both Fort Jefferson and adjacent islands), laboratory workers and family members joined the expedition as equipment carriers and bird catchers.

Allan was accompanied by his son David. Webster was joined by his wife, Marjorie, and their three teenage children, Nick, Sally, and James. Marty Carter, a senior lab technologist, and Dr. Valentina Isachenko, a visiting Russian scientist, completed the group. The sampling equipment, mist nets, rigging, and other gear filled a medium-sized U-Haul trailer, which was towed to Key West. The team procured two large sacks of grapefruit for $2 at a roadside stand near a citrus orchard.

The morning was bright and sunny in the Key West harbor, and the sea was relatively calm when supplies were loaded onto a 50-foot Coast Guard cutter. Members of the group were quite surprised when the captain asked everyone to come into his cabin. The moment the vessel turned into the open ocean, everyone understood why: The waves were 10–12 feet high. When the twin diesels opened up, the

ship was awash in water and spray. It was a rough trip. A sailboat was making a mayday call, but the Coast Guard ship could not assist because it was fully loaded. The Coast Guard captain must have requested another rescue boat, for later that day the sailboat was towed into the harbor at the Dry Tortugas.

Fort Jefferson was the perfect place to weather a storm, for the walls were 10 bricks thick, with superb arches and internal passageways. The weather rapidly improved, permitting the party to take their bird catching and sampling equipment to the adjacent islands by rowboat. Since the birds were not nesting, the team set up mist nets to catch the sooty terns and noddy terms. Mist nets, as the name suggests, are extremely fine nets. When they are set up in the shade of the bushes, birds fly into them and get entangled.

The entrapped birds were rapidly removed by the eager young people and put into holding cages. A blood sample was collected, and a swab was taken from each end of the bird. With many willing helpers, great weather, and cooperative birds that flew into the mist nets, the team rapidly filled their sample vials and stored them in the liquid nitrogen dewar immediately after returning to the fort. The blood samples were allowed to clot overnight, and the serum was separated and stored in the liquid nitrogen tank.

When not catching birds, the expedition members swam, fished or snorkeled among the beautiful coral reefs. One notable catch was a shark so big that the team could not lift its head out of the water before it was released. Allan found a use for the abundant grapefruit, making a perfect tipple that he named the "Fort Jefferson wonder." The concoction consisted of Bombay Sapphire gin with no more than 5 milliliters of fresh-squeezed grapefruit juice.

The return trip to Key West was delayed for two days by another storm, and by the last evening the only item on the menu was the remaining grapefruit. The return trip to Key West and back to Memphis was uneventful, bringing over 500 samples from apparently healthy sooty and noddy terms.

Back in the laboratory, Allan and the rest of the laboratory team were keen to know if the samples from seabirds in the Tortugas and Guano Islands yielded influenza viruses or had antibodies to influenza viruses in their sera. Researchers injected liquid from the swab vials

into 10-day-old embryonated chicken eggs and tested it for influenza viruses after three days of incubation at 35°C. The sera were tested for antibodies to influenza virus. To the scientists' disappointment, the samples from both the Tortugas and Guano Islands all came up negative. They thought of the old English adage: "All that for nothing, how much for sixpence?"

One success they had from the trip to the Guano Islands was that their presentation to the staff was extremely memorable—not for the success of the science but for the odor. The team had brought back plastic bags of guano, and at the right moment the covers were removed from the preheated trays of guano. The talk raised quite a stink!

Before giving up on the search for influenza viruses in aquatic birds, Webster and Allan decided to look in their own backyard.

Each year, thousands of wild ducks and geese migrate from Canada down the central flyway through Arkansas in late November or early December. Local hunters, including the husbands of some of the virology staff, shot and brought their birds to a local cleaning station in West Memphis, Arkansas. The first batch of swabs tested from these wild ducks yielded influenza viruses. It was a case of being in the right place at the right time, since influenza is detectable for only a limited time after infection.

The study of influenza in wild ducks in West Memphis renewed the enthusiasm to search for the origin of pandemic influenza viruses and formed the spark that eventually led to the concept that the aquatic birds of the world are a major reservoir of most influenza A viruses in nature. Later studies on shorebirds that migrate from the southern tip of South America (Tierra del Fuego) to the Arctic region in Canada yielded up to 20% of influenza-positive red knots and ruddy turnstones when they stopped to refuel on horseshoe crab eggs at Delaware Bay in mid-May.

Allan played an important part in the establishment of the knowledge concerning the natural reservoir of influenza in the world. After the disappointment of the study on birds from the Guano Islands and the Dry Tortugas, Webster and Allan were about to give up on influenza studies in wild aquatic birds, but Allan in his wisdom encouraged the continuation of the studies. In reality, he was the power that enabled others to be successful scientifically.

Fort Jefferson in the Dry Tortugas was an idyllic place to sample birds for influenza viruses. The fortress once guarded the shipping lanes to the Gulf of Mexico.

Gulls, sooty and noddy terns on the island adjacent to Fort Jefferson.

Allan Granoff in the internal courtyard of Fort Jefferson, determining if the wind was too strong to row to the adjacent island.

Allan (center) takes a break amid a Guano Islands bird colony.

CHAPTER 11

Genetic Reassortment: Plum Island

For 10 years, Allan worked on the genetics of influenza viruses and Newcastle disease virus (NDV) in George Hirst's laboratory in New York. When the opportunity arose to participate in an influenza genetics study at Plum Island, New York, Allan was excited about joining the team. The research question was whether two different influenza A viruses could reassort their genetic information in animals. One of the hypotheses for the emergence of pandemic influenza viruses was that they arose by reassortment between human and other animal strains—keeping in mind that influenza has eight segments of genetic information in the form of RNA.

The possibility existed that scientists might generate new influenza viruses that could be transmitted and cause diseases in humans and lower animals. Therefore, it was necessary to do the experiments in high-containment facilities. In the early 1970s, St. Jude did not have such facilities, so they contacted the director of the U.S. Department of Agriculture (USDA) high-containment facility at Plum Island. The St. Jude team explained their proposal and asked for permission to do the study in their laboratories.

The USDA facilities were designed to work with exotic animal diseases and to develop control measures including new vaccines and antivirals. Director Jerry Callis granted permission for the studies, and Charles Campbell agreed to be the host and mentor, training Allan and Webster on all the safety procedures. Individuals were required to doff their street clothes as they entered the research buildings and then don laboratory scrubs. Before exiting, the individual had a long shower, and nothing left the laboratory except a well-scrubbed person. All the air in the building was HEPA (high-efficiency particulate air) filtered, and all other waste was autoclaved (pressure-cooked) before being discarded.

Plum Island is located at the tip of Long Island, New York. Getting to the island itself involved a short boat ride on a ferry operated by the high-security government facility. While outdoors, scientists had to be accompanied at all times by a staff member, including during the boat ride.

Webster and Allan had sent their influenza viruses to be studied ahead of time, and they were cleared into the facility before the team's arrival. During the studies at Plum Island, the team stayed in a hotel at Greenport, with Campbell providing transportation each day.

In the high-security laboratory, the roles were reversed. Allan was the technologist and animal handler, while Webster was the study designer (after prior planning at St. Jude with Allan). Allan was a superb technologist, making it clear that he had been a skilled bench scientist before becoming an administrator.

In the first experiments, the scientists asked if two different influenza viruses could reassort—mix their genomes when they both multiplied in an experimental animal. Young turkeys were co-infected with H6N2 turkey influenza virus, which caused mild respiratory infection in the birds. The turkeys were also infected with H7N7 fowl plague virus, which was deadly to chickens and turkeys, but had not transmitted human to human. The turkeys were infected with both viruses in a high-containment room, where the researchers wore masks, gloves and gowns and showered immediately after handling the animals. The turkeys' throats were swabbed each day, and by the sixth day the fowl began to die of severe disease. Viruses containing mixtures of surface glycoproteins H6N7 and H7N2 were isolated from each of the turkeys, indicating that they had mixed their genomes.

In the second experiment, Webster and Allan asked if only one of the two co-infecting viruses multiplied in the animal and the second did not, would the viruses still mix their genetic information? This experiment was done in pigs co-infected with classical H1N1, a swine influenza virus that multiplies well in pigs, and with H7N7 fowl plague virus, which does not multiply in pigs. Once again, reassortant viruses containing H1N7 and H7N1 surface glycoproteins were detected in the pigs. Since these studies were done in the age before genetic sequencing, the scientists did not know which of the other gene segments in the viruses had also reassorted.

Webster and Allan were excited. Allan decided they had "hit a home run," because the experiment demonstrated influenza viruses could reassort their genetic information when they co-infected an animal. This would provide a possible explanation of how new

influenza viruses such as the Spanish flu of 1918 and Asian flu of 1957 could have emerged. Allan was listed as contributing author on the study, which was titled "The in vivo production of 'new' influenza virus (I) genetic recombination between avian and mammalian influenza viruses." The manuscript was submitted to one of the leading journals in experimental medicine but was rejected. Allan immediately suggested sending the paper to George Hirst, who would understand the significance of the work. Allan was right—Hirst accepted the manuscript with practically no changes.

Despite the formal demonstration of reassortment of influenza viruses in animals, the system was artificial: Both parental influenza viruses had been put into the same animal, and the detection of viruses with mixed genes was only possible after selection against the parent viruses with antibodies. To mimic what could occur in nature, Webster and Allan decided to infect one animal with one influenza virus and another animal with the second influenza virus. The scientists would then put the infected animals in contact with a flock of other animals and determine whether influenza viruses with mixed genetic information could be detected in the flock.

The researchers repeated their original experiment, this time infecting two young turkeys with H6N2 turkey influenza in one room and two turkeys with H7N7 fowl plague in another room. Two days later, the infected birds were mixed with 26 young turkeys. Both parental H6N2 and H7N7 influenza viruses spread in the flock. By the ninth day, reassortants containing H7N2 were isolated.

One of the contact turkeys exhibited only the reassortant H7N2 virus. To determine whether the reassortant virus had the ability to become dominant over the parent viruses, the team infected two birds with each of the parent influenza viruses (H6N2 and H7N7) and two with the reassortant H7N2 and mixed them with contact turkeys. The parental viruses spread into the contact birds, but the reassortant failed to spread. The study showed that while reassortants with mixed genetic information emerged easily, additional properties were needed for the reassortant to become a dominant strain and spread. This could explain why novel influenza viruses that can cause pandemics in humans occur rather infrequently.

The study not only repeated the duo's initial work, but also showed that it is more difficult to generate a reassortant that will spread. This time the manuscript was accepted without difficulty, and Allan was again the contributing author.

An incident that did not get into the written report was the flooding problem that occurred during clean-up of the containment room after the large turkey experiment. While Webster was washing the last of the waste down the drains, Allan was showering in another room. Waste and water started backing up, and Allan returned to help (now stark naked). There was a high-pressure steam hose used to clean the room, so Webster and Allan pushed the hose down the drain and turned on the steam. Fortunately, the high-pressure steam cleared the blockage and did not spring back to steam-clean the naked chief.

Weekend activities at Plum Island once again included fishing. The staff explained that the blues were running and offered to take the scientists fishing. The first trip was a bust, without even one bite. The following weekend was the antithesis—after finding a school, the fishermen snagged a bluefish on every cast until their arms ached and they caught all they could give away.

The experiments with Allan at Plum Island were successful because they demonstrated how novel influenza viruses could evolve in nature. Allan not only supported the work, but he also joined in the planning of the study, working at the bench and in the high-containment animal rooms—a real scientist with always a joke or story to share.

CHAPTER 12

Allan's Jalopies

Allan was an extremely generous person, and yet also quite frugal. As a master recruiter, he brought people from all over the world to visit St. Jude and persuaded them to take on the challenge of establishing a first-class research institution in Memphis, Tennessee. That meant he always met new recruits at the airport. Several of the early recruits were initially quite concerned about Allan's vintage automobiles. His first postdoctoral fellow, David Kingsbury, later wrote, "You would step into a vehicle with unraveling upholstery, the mechanical workings inside the doors exposed by the absence of side panels, and you'd hunch into your seat in fear of being snagged by the hardware."

All Allan would say was, "Isn't this a great car? I'll never sell it."

Some people consider an automobile as a status symbol that reflects the importance of an individual. Not Allan. He considered cars as modes for traveling from point A to point B. His initial car at St. Jude was a 1957 Ford Ranch wagon that he brought from New York. This car was fondly designated by staff and family as the Grey Ghost. It was rarely, if ever, cleaned and was driven until it became the vintage machine described above.

When Allan eventually got around to selling his well-used cars, he always disposed of them within the department. The Grey Ghost was sold at a reasonable price to the relatives of his senior technologist. His later cars were also sold to individuals within the department. One of note was the 1971 Chevy Malibu that he sold to a new postdoctoral fellow from Japan. This young man had never owned a car, and he aspired to have a big American dream machine. The 1971 Chevy Malibu fitted the bill perfectly. Although it was used, the vehicle ran quite well. The postdoc was doubly impressed that he was not only obtaining the car from the famous Professor Granoff, but that on the day of his purchase the professor took him personally to the AAA road service group to buy a membership.

For the next three months, the postdoc considered the car a great automobile with a comfortable ride. Then the troubles began, and he

quickly learned the value of AAA service and the wisdom of joining that organization. After the sixth call, they dropped his membership. His next car was a small, new Honda that ran forever.

It is notable that Allan's family and relatives presented him with new cars as major gifts. When he married Fay in 1966, his mother-in-law from his first wife (Shirley's mother, Blanche) gave Allan a new blue 1965 Pontiac as a wedding present. Fay owned a 1962 Chevy Nova convertible, so the family had much more upscale wheels than before. The convertible Chevy Nova became Allan's favorite car. He taught each member of the family to drive in that car, and he proudly met new recruits at the airport in it. One of those recruited technologists remembers that Allan met her in the convertible after it had aged to suit his image. She was told to mind the hole in the floor and to avoid dropping anything.

His family tried to improve his image by providing new cars at critical times, surprising him with a new Honda Accord EX sedan for his 70th birthday.

The ultimate demonstration of Allan's frugality with both automobiles and St. Jude funds occurred in 1992, when the Board of Governors appointed him director of St. Jude Children's Research Hospital. As part of the director's benefits, he was provided with a new car. The expectation was that the director would choose the top-of-the-line car of his choice. But not Allan. He chose a purple Toyota Camry—an overly average automobile—for he was strongly committed to the concept that money raised for St. Jude was there to benefit the children.

CHAPTER 13

Hawaii

Establishing a virology laboratory at St. Jude between 1962 and 1975 was a major challenge. Recruiting scientists to Memphis was tough. The response of most people was, "You are crazy to leave the intellectually stimulating and career-building environments of the east coast of the United States (or Melbourne or London) to go to a mid-south backwater."

Donald Pinkel, the first director of St. Jude, and Allan were a perfect pair. Pinkel was stubborn and refused to take no for an answer; Allan was a super salesman who had been trained in sales before attending the university. He successfully built a world-class Department of Virology.

Of the five basic science departments started at St. Jude in 1962, Virology was the only one that survived after five years. Those that did not survive were later reinstated as the institution grew: the immunology laboratories initially became part of Virology, but later separated with recruitment of Dr. Frank Adler and later Dr. Peter Doherty. Not only did the Department of Virology survive, it thrived. The research projects in his department were fully funded from extramural sources, principally the National Cancer Institute and the National Institute of Allergy and Infectious Diseases at the National Institutes of Health.

By 1975 the laboratories of Virology and Immunology were well established and fully funded. It was time for sabbatical leave; defined as the time when "the archaeology professor takes a semester to go on a dig" or "a rest or break from *real* work." Where to go? For Allan it was a no-brainer: To an ocean with beaches to walk.

He applied to the University of Hawaii School of Medicine and was accepted in the Department of Tropical Medicine and Medical Microbiology. This was the perfect place for Allan. He turned the Department of Virology and Immunology over to Dr. David Kingsbury, who served as acting chairman while Allan took Fay and their family off to Hawaii.

His office at Leahi Hospital looked into the crater at Diamond Head with a distant blue-water view. This was the perfect place for Allan, and he quickly developed a sense of belonging (or *Kama'aina*, defined as a "child or person of the land"). While he served as a consultant on virology, cancer and science to the staff of the Hawaii School of Medicine and stayed in contact with his frog-virus team at St. Jude, he also explored his artistic talents—including sketching, acting and experiencing the islands and their beaches.

Whenever one or more of his friends and colleagues visited Hawaii, Allan was the perfect host. Dr. Virginia Hinshaw, a member of his department in Memphis, described Allan perfectly.

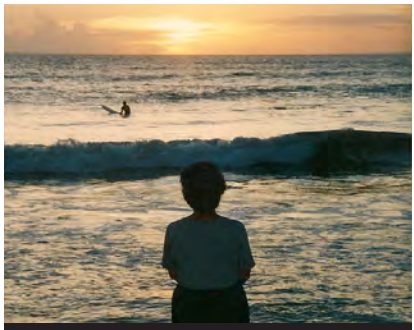
"He was always up for an adventure, so when I visited we took a glider ride off the cliffs, which was a first for me and very exciting," she said.

Hinshaw was interested in collecting fecal samples from seabirds to test for influenza viruses. Allan sent her to Angel Island for sampling birds, which involved a swim with the sharks, for the boat could not land. The sampling of birds was in an artillery range, and Hinshaw kept wondering if the shooters knew the visitors were there. It is noteworthy that Hinshaw later became chancellor of the University of Hawaii, so Allan once again served as a great recruiter.

Allan's equivalent of an archaeologist dig in Hawaii was sketching the palm trees that lined the beach as they caught the morning light. This was the perfect way to "charge one's batteries," to cope with the many challenges of being a senior administrator. His other objective was to collect stories and jokes, for he knew that Danny Thomas would visit soon after he returned to St. Jude.

Sabbatical in Hawaii

Allan with his bodyboard



Fay Granoff watches Allan surf.

David and son Zach pause with Fay and Allan near the Banzai Pipeline—a famous surfing spot in Oahu.

Allan scuba diving at Hanauma Bay

CHAPTER 14

Rumors of a Move

There was a rumor among the staff at St. Jude that Allan was an applicant for the directorship of the Cancer Research Center in Hawaii. After his great success at establishing a new research Department of Virology at St. Jude that interacted effectively with clinicians, it seemed highly likely that he would be selected. The scuttlebutt was that he made it to the final round of selection but was not offered the job—perhaps because they wanted a physician rather than a scientist. In the longer term, this benefited St. Jude, because the impact of molecular biology was providing new insights into understanding the fundamental steps of how viruses infected cells and multiplied.

Allan realized the importance of these advances and knew that this strategy would provide new approaches to the development of novel antiviral drugs and vaccines. The name of the department was updated to the Department of Virology and Molecular Biology to more accurately reflect the unit's continuing development of Allan's department.

The staff of the St. Jude Virology Department, 1979.
From left, front row: Helen Hogan, Allan Granoff;
second row: Amelie Christian, Josie Harris, Ramila Shah,
Sallie Clark, Virginia Hinshaw, Betty Ann Lyne, Martha Sugg,
Allen Portner, Jocelyn Burks, Mary Ann Grynkiewicz,
Janet Schieber, Jo Ann Carpenter, June Holland;
third row: Mike Berton, Rakesh Goorha, Donna Clift, Susan Carr,
Carol Anne Bockhold, Ramona Tirey, Ruth Ann Scroggs, Gopal Murti,
Dawn Willis, Exeen Morgan, Kathleen van Wyke, Robert Webster;
fourth row: Lawrence Amesse, William Bean, David Kingsbury,
Gregory Chinchar, Carroll Pridgen, Jim Bigelow, Allan Tereba,
Robert Ellis, G. Sriram, Alford Pointer, Chung Hsu, Maurice Bondurant,
Rajendra Raghow, and Bobbie Jean Fisher.

Allan the Artist, Actor, Jokester

In the early days of St. Jude when Danny Thomas made regular visits to the hospital, his first stop was to Allan's office. It was a case of "birds of a feather flock together." Thomas recognized that Allan was a kindred spirit. If Allan had not been a scientist, he would have surely been an actor or an entertainer like Thomas. The staff always wondered whether Thomas was collecting some of Allan's jokes while also learning about the latest advances in science.

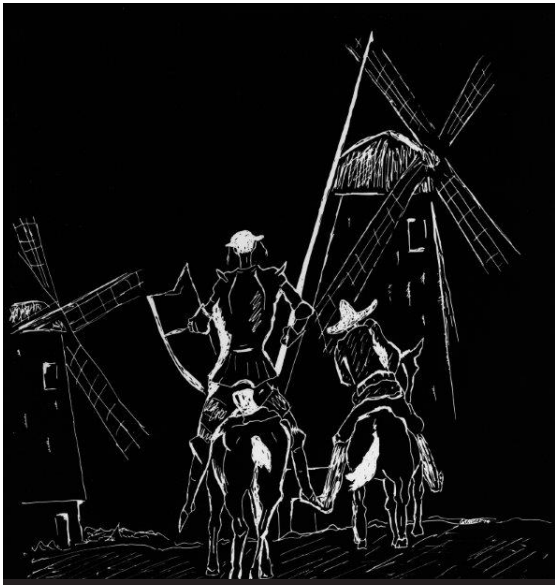
Art is a venue for self-expression, and Allan engaged in multiple art forms. Pen and ink on paper was his pictorial expression of peace with the world, while acting was his passion and his dream that filled his extroverted nature. His ability to collect and tell jokes was one of his special fortes, and he used this ability to lighten the mood.

A sketch of the Hawaiian shoreline by Allan Granoff while on sabbatical in Hawaii.

His jokes were one of his many administrative skills. Each of these art forms provided an alternative to his science, but in many ways the art forms filled part of his personality that science could not provide.

Allan loved to interact with people of different interests, cultures and nationalities. He had the enviable skills of being able to talk with anyone and everyone, putting others at ease and being a great listener. One of Allan's valuable pieces of advice was to learn how to be a good listener even if the topic was of no interest. It is always wise as a chairperson or administrator to let people express themselves and fully vent any issues of concern.

Besides palm trees in Hawaii, another favorite sketch topic was Spanish conquistadors on horses with windmills. These reflected Allan's love of theatre and of the musical *Man of La Mancha*. He loved to share his sketches and had high-quality copies made for his family and staff. Some of his art still adorns the walls of St. Jude. One of his other talents was to visit the hospital rooms of children with cancer, where he would draw pictures of Mickey Mouse and perform magic tricks with coins.



Tilting at Windmills: Sketch by Allan Granoff.

Allan's other escape from science where he could express his love of life was as an actor, in every venue: on the stage, in film and in the genesis of the Christmas skit in the early years of St. Jude.

The community theatre in Memphis provided the opportunity for people of every level of talent to participate. The theatre itself has an interesting history. It started as the Stable Playhouse in a stable on the grounds of the James Lee Art Academy in the early 1920s. In the late 1920s, it moved to the Memphis Pink Palace—a mansion built of pink Georgian marble by Clarence Saunders, the founder of Piggly Wiggly grocery stores. Before completion of the magnificent mansion, Saunders had to file for bankruptcy. The building was given to the city as the Memphis Museum of Natural History and Industrial Arts. The second venue of the theatre was in the shallow end of the unfinished indoor swimming pool, and the name changed to Memphis Little Theatre. Allan acted in many plays at

the Pink Palace and later in the freestanding theatre. In the early 1970s, the theatre moved to a home of its own in a newly designed building and its name changed to Theatre Memphis.

Soon after coming to Memphis, Allan auditioned for plays at the Pink Palace and was cast in *1776, Death of a Salesman, Uncle Vanya, The Bear Trap, Waiting for Godot, The Unsinkable Molly Brown,* and *Cat on a Hot Tin Roof.* During the casting of *Cat on a Hot Tin Roof,* Allan was chatting with the actress who played the cat. She asked if he had done much theatre. Allan mentioned that he had been in a play at school some 20 years before, and that the local New Haven paper had given him a good review. She politely commented that she wished she had seen his review, to which he replied, "Wait, I've got it right here," and pulled the folded newspaper clipping from his wallet. He was still carrying it around.[32]

Although Allan loved to act, he did not have a voice for song and was told by the director in musicals like *1776* to mouth the words but remain silent.

Walking Tall, Granoff style

While the Granoff family were in Hawaii, the movie *Walking Tall Part 2* was released. In this film, Allan played the part of a policeman. On many evenings, his family would take the car to the drive-in movie theatre at exactly 9:10 p.m. and park in the exit lane—for that was when Allan's appearance in the movie occurred.

The Granoff family members recall the event:

> At 8:34 p.m., the Granoff household is in complete disarray.
>
> An outsider might assume the worst. After all, Cold War tensions have eased, but with the Kahala neighborhood in Honolulu as close as ever to conflicts abroad, such rush and confusion could only mean the unthinkable has happened. Nuclear conflict, tsunami warnings, imminent invasion…
>
> Allan jostles car keys in his hands, working time backwards. He is tall and slim, with long arms and a sharp jaw, tanned to an almost local tint. His silver chain—St. Jude,

St. Christopher, and the Star of David (to cover all the bases)—glints in the opened collar of his Hawaiian shirt, one of a dozen shirts in rotation during his vacation.

"Let's go, let's go, let's go!" he repeats to the room, eyeballing everyone and everything at once.

A Pacific breeze swells up and through the open windows of the home, which has been provided by another doctor for the Granoff sabbatical. Leftover beach towels dance in response.

The clock refuses to move any slower—but his kids do. David slips in through the side door, late and with his hair still wet, eyeballing a surfboard he's balanced on the outer wall. Jimmy, on the other hand, is ready to go out, already dressed for work at the disco. Barbara refuses to leave, on the account that "we've already done this enough." At least Nina is in the car.

Fay comes in from buckling their youngest into the backseat of an eyesore grey Mercury Capri. She gets to the home's front door and hears the call that still has the power to change everything:

"JIMMYBARBARADAVID!"

Everyone stops. Waits.

"Car. Now."

And so, like Pavlov's dogs to the call, the kids cram into the backseat. The engine lags, hiccups, and finally sputters to life. Off they go.

For one with such a patient demeanor, Allan drives like a madman down Kilauea Avenue. Passing tourists and shimmering palms, he constantly compares his wristwatch to the Capri's clock, irritated that one is half a minute faster than

the other. Such a discrepancy could lead to them missing it, being too late for something that wouldn't last forever. (His children, when asked to recall one of these nights from the depths of memory, believe the time in question to be 9:42, 8:32, and 9:10, respectively).

Nevertheless, before blame can be apportioned, vibrant luminescence passes through the treetops. Flickering off bark and leaves all around, the Waialae Drive-In gives itself away before its towering projection screen comes into view.

The family pulls through an exit to avoid the ticket booth, and Allan backs the car into their usual spot. The drive-in is a little empty, even for a weeknight, which Allan takes as a personal affront. Jimmy, Barbara, and David fight for a view from the backseat. Nina—on Fay's lap now—watches from the front with a little less interest. And, as if right on cue (having done this several dozen times by now), the entire car goes silent, transfixed by a picture on the silver screen.

At one hour and 32 minutes into *Walking Tall: Part 2,* the villain suspected of attempting to kill Sheriff Buford Pusser is locked up in a hospital. A seductive, red-headed accomplice arrives, requesting visitation from the officer on guard duty by claiming to be the man's wife. And there he is—deemed a more suitable cop than doctor (having first auditioned for the role most familiar)—in all his thespian glory.

"Sorry ma'am, ain't allowed to take nothing in," starts Allan, who plays a man all too preoccupied with his sudden attraction. She runs her hand across his face as she enters and, by the time the protagonist shows up, has already helped the criminal escape.

"But it said right on her card, Ruby Anne!" pleads Allan to the towering Pusser, ending his moment of stardom.

This was the highlight of Allan's acting career. From that time on, new recruits to St. Jude were invited to his home and were entertained with a short clip from the film showing his part.

In the mid-1970s one of the leading television programs was *Hawaii 5-0*. Allan's dream was to be invited to act in at least one episode. He contacted the producers, offering to play the part of a visiting scientist and doctor. The invitation never came and was a disappointment.

Nose to nose: Allan Granoff and Danny Thomas became close friends, sharing family time, science, and jokes.

While the role might be small and the part tacky, especially for someone so capable of changing lives in the most selfless of ways, Allan adored every opportunity he had to perform—whether appearing in Memphis Little Theatre productions, swapping jokes with Danny Thomas or performing feats of magic for the young patients at St. Jude.

A skit for St. Jude

At St. Jude, Allan was one of the proponents of the original Christmas skit. This event brought the entire staff of the institution together to have a little fun, lower the egos of the senior staff, and find the common ground of comedy among the faculty and staff. The foibles of the senior staff were parodied in song and dance akin to the television program *Saturday Night Live*. For example, after Allan and his family returned from sabbatical to Hawaii, the next Christmas skit poked a little fun at him. His senior male staff, including Alan Portner, Gopal Murti, Rocky Goorha and Robert Webster, dressed in grass skirts with half coconuts as breasts and danced to Hawaiian

music in big boots singing a silly ditty about how Allan had deserted his staff and that his real love was Hawaii. None of the players could dance even one step, but the act was well received.

One of the things that was lost as St. Jude grew was the Christmas skit. Some of the senior staff found the takeoffs too satirical and felt insulted. Those who could "dish it out" could not take the ribbings and persuaded the director to discontinue the event. This was most unfortunate, and Allan, like most of the staff, felt that St. Jude was losing something important: the ability for staff to laugh at their own faults.

Master storyteller

When it came to joking, Allan was a master storyteller. Many of his jokes referenced his Jewish heritage, which he skillfully exploited to enhance the effect. He often injected Yiddish terms and inflections into responses to colleagues in the laboratory. Kingsbury recalled a few of Allan's quips:

> "Now you're thinking with your *tuckas* (buttocks)!"
>
> "You call that an experiment? It's not worth *bupkes* (emphatically nothing, goat droppings)!"
>
> "I told my parents I was working with chicken viruses. They said, 'For this you became a *doctor*? From *this* you make a *living*?'"
>
> "So, your first experiment looked like a Nobel Prize winner, but five times you haven't been able to repeat it. Look at it this way: at least for a moment you were on top of the world."
>
> "For eight years I've been working with *farshtunkene* (stinking, contemptible) virus, and I still can't get it to grow. It hits me right in the *kishkes* (intestines, guts)."

Allan was frequently invited as a speaker at other institutions, where he would begin each session with a self-deprecating joke.

Other jokes he told were more ribald, but generally culminated in the audience dissolving in laughter.

Telling jokes and interacting with people was an integral part of the whole person. This was apparent at the final meeting of his extended family; at his funeral each speaker celebrated Allan's life with one of his jokes.

CHAPTER 16

The Golden Years

After a highly successful career, Allan stepped down as chairman of Virology and Molecular Biology in 1988. He could have headed for one of the major beach resorts on the mainland or gone back to Hawaii to enjoy his well-earned retirement. Instead, his dedication to the mission of St. Jude was so great that he let himself be recruited to the director's office as deputy director. Dr. Joseph Simone, the third director and CEO of St. Jude, knew Allan and his many strengths and wanted him as part of his administrative team.

Simone had arrived at St. Jude in 1967 as an assistant member in Hematology/Oncology. He rose through the ranks, and in 1977 was recruited as physician-in-chief and director of Pediatric Oncology at Children's Hospital at Stanford in Palo Alto, California. Less than a year later, Dr. Alvin Maur, the second director at St. Jude, recognized that losing Joe had been a mistake and recruited him back to St. Jude as assistant director of Clinical Research. In 1983 Joe was appointed the hospital's third director.

During the Simone years, the reputation of St. Jude continued to grow as one of, if not the best pediatric cancer centers in the world. This was illustrated when "out of the blue" in December 1984, Washington University invited St. Jude to relocate its campus to St. Louis. Simone viewed this invitation with great pride and seriously considered it, because an affiliation with such a prestigious university would further enhance recruitment of the best and the brightest scientists in the world.

The offer from Wash U to relocate St. Jude was kept secret during the initial negotiations. Allan was a member of the group of five people at St. Jude who were "in the know." These included Simone and Chuck Sherr from St. Jude, and Dick Shadyac and Al Joseph from ALSAC and the Board of Governors. Allan, Simone, and Shadyac met with Danny Thomas to fill him in. Thomas' response was that he was "depressed and scared to death," but he supported the idea. March 9, 1985, a major meeting occurred at Wash U. Thomas, Shadyac, Simone, and Allan checked into a hotel in St. Louis under

assumed names. This was done to keep negotiations secret. Wash U pulled out all the stops and convinced the St. Jude group, including Thomas, that it was in the hospital's best interest to move.

It was not until June that Simone shared the news with the faculty. When the Memphis press broke the news to the public, many were bitterly disappointed that St. Jude would leave to affiliate with a stronger research university than the University of Tennessee (which had a medical school in Memphis). The mayor, congressman and Governor Lamar Alexander placed enormous pressure on St. Jude to stay.

Allan was a master administrator during this period while he worked with Simone and the committee planning the move. Allan convinced the staff of Virology and Molecular Biology that the move to St. Louis was a tremendous opportunity for the future of research and clinical development at St. Jude. Everything regarding the move to St. Louis was a "go" from the perspective of the hospital's research staff. However, after several months of negotiations, the Boards of Governors at St. Jude and ALSAC declined the offer from Washington University. The main consideration given publicly was that at Wash U there was no room for St. Jude to expand. Additionally, ALSAC was concerned about future fundraising, and the newly appointed chair of pediatrics at Wash U was less than enthusiastic. The rumor was that Wash U wanted the final decision on the cancer patients accepted to St. Jude. In retrospect, one cannot but wonder if Danny Thomas and Allan had cried at the prospect of moving St. Jude from Memphis and had been less than enthusiastic about the move all along.

Additional incentives to stay in Memphis had come from the state of Tennessee and the city of Memphis. The outcome was to markedly increase funding to foster scientific research at St. Jude, the University of Tennessee and Le Bonheur Children's Hospital. Plans were made to move some of the clinical care of patients from St. Jude to Le Bonheur. The outcome was a $72 million expansion of St. Jude facilities and the initiation of the pediatric AIDS program by Dr. Walter Hughes and his staff in 1988. Because the number of pediatric cancer patients off therapy had reached 1,300, the hospital created a new clinic called the After Completion of Therapy (ACT)

clinic. Pediatric cancer treatment was not moved to Le Bonheur and was continued at St. Jude after the 1991 construction of the Danny Thomas Research Tower expanded the hospital's treatment facilities.

One of Simone's maxims was, "With rare exceptions, the appropriate maximum term for an academic leader or administrator is 10 years, plus or minus three years." Simone served as director from 1983–92. In keeping with his own maxim, he resigned in 1992 and moved on before the Board of Governors found a new director. The solution was obvious to the Board of Governors and to the executive committee: Allan was moved into the directorship while the search for a new one continued. The usual term for this position is interim director, but Allan disagreed. He argued that he carried the full load of director so why should he be an interim or acting director?

"We never referred to Joe Simone as permanent director, so why should I be the interim director? I'm the director—with all the duties the title implies—but for an interim period of time," he said.[33]

Allan enjoyed his term as director.

"If you have good people working for you—people you trust—the work becomes easy. I've always had the philosophy that you have to give people responsibility, but you also have to give them authority that goes with the responsibility. I'm just the maestro who waves the baton, and that's the way it should be," he said.[34]

Over the years, he had dealt with every aspect of administration and honed his skills at dealing with people—even dismissing some employees, who left without rancor.

Allan particularly enjoyed representing St. Jude to the public and telling the Danny Thomas story to potential ALSAC donors. His talent as an actor came to the fore when invited to speak at dinners or with visiting TV crews. These responsibilities were time consuming but were an important part of spreading the message that funds donated to St. Jude did go to the care of the children and that basic researchers were required to raise their own funds for laboratory studies, travel, and support. Another one of Allan's aphorisms was that "The funds are raised for the patients."

To honor Allan's many contributions to St. Jude, the faculty, ALSAC, the Scientific Advisory Board and the Board of Governors approved an annual Granoff Lecture in 1992. For the first decade

of this lecture series, Webster had the honor of finding speakers and arranging the celebratory dinner to follow. The scientific community held Allan in great respect, and every one of the senior scientists and Nobel Laureates invited to speak accepted with pleasure. In the early years of the lectureship, Allan attended the events, and later his family attended.

Granoff Lecturers at St. Jude Children's Research Hospital

1992 Harald zur Hausen, MD
1993 J. Michael Bishop, MD
1994 David Baltimore, PhD
1995 Phillip A. Sharp, PhD
1996 Robert A. Weinberg, PhD
1997 Harold E. Varmus, MD
1998 Rolf Zinkernagel, MD, PhD
1999 Robin Weiss, PhD
2000 Peter Howley, MD
2001 Suzanne Cory, PhD
2002 Bernard Moss, MD, PhD
2003 Adriano Aguzzi, MD, PhD
2004 Grant McFadden, PhD
2005 Yoshihiro Kawaoka, DVM, PhD
2006 John Hiscott, PhD
2007 Anne A. Gershon, MD
2008 ADME Osterhaus, DVM, PhD
2009 Herbert "Skip" Virgin, MD, PhD
2010 Joseph Sodroski, MD
2011 Robert Lamb, PhD, ScD
2012 Ian Wilson, D Phil, DSc
2013 Ian Frazer, MD
2014 Robert Webster, PhD
2015 Stanley Lemon, MD
2016 Britt Glaunsinger, PhD
2017 Clodagh O'Shea, PhD
2018 Malik Peiris, DPhil
2019 Terence Dermody, MD, PhD
2020 Julie Pfeiffer, PhD

In 1993, St. Jude recruited Dr. Arthur Nienhuis from the National Institutes of Health as the hospital's fourth director, and Allan again returned to the position of deputy director. Nienhuis was the first non-pediatrician M.D. director to be appointed at St. Jude. He had been working on gene therapy at NIH and was an optimal choice for providing new strategies for pediatric cancer treatment.

Making a presentation to David Baltimore after the 1994 Allan Granoff Lecture were (left to right) Allan Granoff, Rakeesh Goorha, David Baltimore, and Robert Webster.

By this time, scientists were studying genomics of the human host and the endless array of parasites. Additionally, the genes associated with cancer were being resolved. The dream was to be able to repair damaged genes using gene therapy. During his tenure as director, Nienhuis and his team initiated the use of modified retroviruses for the treatment of sickle cell anemia. This therapy is designed to correct the mutation causing sickle cell disease and cure the debilitating disease.

Allan's move back to the deputy director position provided a smooth transition for a new director to learn the ropes at St. Jude. Allan struggled with new management, and within a year moved again—this time to the position of associate director of Academic Programs. Then he decided it was time to go. After 32 years at St. Jude, Allan chose to return to his love of the sun and the ocean.

Soon after retirement from St. Jude, Allan and Fay moved to a high-rise condominium in Naples, Florida, near their oldest son, Jimmy, and his family. The location was absolutely perfect for Allan. The condo looked out over the Gulf and faced the west. At regular intervals, his devoted staff visited Allan and Fay in Naples

and reminisced about St. Jude. Allan was still St. Jude centric, and his questions covered every aspect of the institution. There was a set ritual in the late afternoon: The visitors would be served their drink of choice, and Allan would have his famous martini—Bombay gin with only one or two drops of vermouth and multiple extra olives. This was in preparation for the daily routine—a search for the green flash as the sun sank behind the horizon over the ocean. Allan said that when conditions were just right it did occur—the most complementary color hues of a setting sun.

Unfortunately, the couple's time in their Naples condo was cut short when, as Jimmy explained, "the curse of the Granoffs—severe arthritis—caught up with Allan." This debilitating disease eventually led to Allan's dependence on a wheelchair. Fay developed progressive dementia and eventually Alzheimer's. The family then had one of those impossible decisions to make, because their parents could no longer take care of themselves. After heart-wrenching decision-making, the family decided Fay would move near Nina in San Antonio in the best care facility available. Allan would move to Balboa Island, California, near Barbara.

After Allan's move to Balboa Island, his colleagues and friends from St. Jude continued to visit. He was still close to the ocean, and every afternoon he would call Fay and speak with her as long as possible. His primary interest after Fay and her well-being was St. Jude. He would not only reminisce about the past, but also wanted to inquire about the latest science and, of course, tell as many jokes as possible.

Allan died at home on Balboa Island May 13, 2012, surrounded by his family. His funeral service was held at the Sam Abraham Chapel in Baron Hirsch Cemetery May 18, 2012. The service was a celebration of Allan's life and achievements. Funeral services are usually rather sad affairs with many tears shed, but Allan's was memorable in that there was considerable laughter among the tears. Each speaker recalled Allan's jokes as well as his achievements and many of his less vulgar jokes were retold.

CHAPTER 17

Epilogue

Allan Granoff was many things: a loving father and husband, a soldier bravely serving his country, a researcher and scientist, an actor and a comedian, a friend and mentor, and above all a humanitarian. At many times in his life, he might have taken an easier path. From freezing while under enemy gunfire, to raising three children as a single father, to accepting the challenges of integration, he did the right thing. Allan Granoff was a *mensch*.

His life's work and those he touched live on. St. Jude Children's Research Hospital is the world-class institution that it is today through the sacrifices and efforts of many, including Allan, who played a major role. As an integral part of Danny Thomas' vision, Allan devoted his life and career to making the dream of St. Jude a reality.

The Chief truly lived a life with and for others. He will always be missed, but never forgotten.

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Samuel Granoff is the oldest of Allan Granoff's grandchildren. He holds a BA from the University of San Francisco and an MA from Duke University, having pitched for both schools' baseball teams. Presently, he is completing his MFA at Columbia University, instructing undergraduate composition and coordinating a veterans creative writing workshop. He is at work on his second novel, an American Western narrated by God.

Robert G. Webster, PhD, is known throughout the world for his expertise in the study of influenza—chiefly for his role in identifying the link between human and avian flu. Webster discovered the importance of aquatic birds as the reservoir for influenza, and he aided the development of better influenza vaccines and anti-viral drugs. He worked at St. Jude Children's Research Hospital from 1968 until his retirement in 2015. Under his leadership, St. Jude was designated by the World Health Organization as a collaborating laboratory on the ecology of influenza viruses in lower animals and birds. Webster remains an active member of the emeritus faculty at St. Jude.