

Gen. Henry H. “Hap”
Arnold is best

known as the commander of the US Army Air Forces during World War II, where he represented the AAF at the highest levels of military and political command. His civilian counterpart, Assistant Secretary of War for Air Robert A. Lovett, knew Arnold as well as any of his associates.

Lovett was not an outspoken leader but a political operator whose efforts smoothed the rough edges between industry and government and facilitated Arnold’s strongest qualities.

Lovett described Arnold as a man of “profound optimism, of absolute certainty of victory in the future, of dedication to [the] effective use of airpower.”

Lovett, whose office was adjacent to Arnold’s in the Pentagon, recalled that Arnold could be a mercurial man who “would be up one minute and down in the depths the next. ... He had a great deal of imagination, in its proper sense, and he inspired others in the confidence which he felt.”

Arnold’s never-say-die attitude was one he learned at the Wright Flying School in Dayton, Ohio, in 1911, but what are the origins of his optimism, dedication, and imagination?

What events shaped Arnold’s creative drive and mercurial nature?

Arnold never flew with Orville or Wilbur Wright. Arthur L. Welsh was his flight instructor and was killed in 1912 in a Wright Flyer C accident. The 1910-1911 Wright Flyer B did not have dual controls. Once a student learned to fly from one seat—Arnold learned to fly in the left seat—they flew only from that seat. In turn, new students were taught to fly from the other seat, a rather confusing arrangement.

Despite the addition of identical dual controls, in



1911 no flight was routine. There were no ground or flight checklists. Only common sense, experience, judgment, and a little luck prevented accidents. Military pilot trainees wore civilian attire at the Wright school and hats were simply donned backward to keep them from blowing off the pilots' heads. During one flight Arnold took a bug square in the eye. After successful removal of the bug's wings from Arnold's eye, goggles became a standard piece of Army flying gear.

Thomas D. Milling, Arnold's classmate at the Wright Flying School, recalled that "when the plane was tuned up ... [the airplane was] like a drum—if you touched it with your fingers, you'd see the cloth and everything had to be tight, and the wires had to be a certain tension, and you could test it by the sound." Plucking a support wire resonated like the sound made by plucking a thick grand piano wire.

In July 1912, Arnold and Roy C. Kirtland crashed just off the coast of Plymouth, Mass., in a new "tractor" seaplane. Arnold lacerated his chin dur-

The damage done was very slight." One pontoon was wrecked, the propeller was destroyed, and one wingtip was crumpled.

No Contest

Shortly after the incident at Plymouth, Arnold won the inaugural Mackay Trophy for the most significant flight of the year. The challenge was to fly a triangular route between Fort Meyer, Va., College Park, Md., and Washington, D.C., locating a "troop concentration" hidden in some trees somewhere along the flight path.

The "contest" was really not a contest at all. Milling, the only other participant, had aircraft problems that kept him grounded. Perhaps because of these circumstances Arnold did not take himself or his accomplishment too seriously. "It [the trophy] certainly is handsome. I figure that it will hold about four gallons so I cannot see how you can fill it with anything but beer," Arnold wrote afterward.

On the heels of winning the Mackay Trophy, Arnold was nearly killed in a

can get in a machine with safety for the next month or two."

Arnold's near-death experience occurred at the end of the mission. He was approaching the airfield for landing and had initiated a steep turn maneuver using 45 degrees of bank with an elevator controlling the turn.

Having plenty of speed in the overpowered Wright C, Arnold's natural tendency was to pull back on the elevator control in an effort to control the uncommanded dive that resulted from the induced stalled condition. The stall was caused by control inputs that exceeded the physical performance capability of the airplane, not by inadequate speed. By applying too much back pressure, Arnold generated what is commonly known today as an accelerated stall and not a spin.

The circular motion described by Arnold was a result of having begun the spiral pattern for landing. It was by luck, rather than skill, that Arnold avoided becoming one of the many fatalities of early military flying.

The stresses of early aviation, includ-

THE LEGENDARY AIRMAN

ARNOLD'S EVOLUTION

By Dik A. Daso

DREW INSPIRATION FROM MANY PLACES.

ing the wreck, receiving the distinctive scar seen in most of his portraits.

Tractors had a motor and propellers in the front of the airplane. Initial assessments of its performance were excellent. Perhaps expecting more performance than the machine could deliver, Arnold attempted to take off carrying excessively heavy baggage onboard. The winds that day were light and variable and although he was able to raise the craft out of the water by taking off facing into the wind, as soon as he turned the craft he lost the advantage of the headwind. "Then I did not have anything to support me and," Arnold recalled, "down I dropped.

Lt. Gen. Hap Arnold—note the scar just beneath his lip, a souvenir of a 1912 airplane crash near Plymouth, Mass.

Wright Flyer C during live-fire artillery spotting exercises at Fort Riley, Kan.

Arnold and his observer were inexplicably thrown toward the ground. Arnold miraculously righted the craft and missed a violent crash by only a few seconds. "I am unable to account for it," he admitted to Capt. C. DeForest Chandler, his commanding officer at the Signal Corps Aviation School. The onboard altitude measuring device, a barograph, clearly recorded a drop of 300 feet in 10 seconds, ending up just above the ground-zero line. Arnold was so shook up he walked back to the airfield and immediately requested three weeks' leave and temporarily removed himself from flying status. "From the way I feel now," he explained, "I do not see how I

ing the ever-present possibility of near-instant death, coupled with the "tough guy" culture of the early 20th century Army, often led to smoking as a form of relaxation and stress release. Arnold was not immune. He was a habitual tobacco smoker until the mid-1920s. After suffering from severe ulcers, his smoking habit was curtailed but never fully eliminated. It is likely that smoking contributed to his deteriorating health, which included a series of heart-related problems during World War II and eventually caused his death in 1950, at age 63.

Arnold's War Department duties included oversight of a secret project officially known as the Liberty Eagle, an unpiloted bomb built into a small gyroscopically controlled biplane.

Unofficially named “The Bug” by Charles F. Kettering, a member of the development team, in secret correspondence the weapon was simply referred to as the FB—Flying Bomb. The unmanned biplane’s fuselage housed a four-cylinder, two-cycle engine and carried 180 pounds of explosives. The craft had no wheels and was launched from a contraption that rolled along a long section of portable rail track. The missile’s engine was cranked at one end of the track and aimed directly at the intended target area. When the engine was fully revved, the mechanical counter was engaged and the Bug was released. When it reached flying speed, it lifted off and flew straight ahead toward the target, climbing to a preset altitude that was controlled by a supersensitive aneroid barometer.

When it reached a preset altitude, the Bug’s barometer sent signals to small flight controls that were moved by a system of cranks and a bellows taken from a player piano for altitude control. A gyroscope helped maintain the stability of the craft and the barometer helped maintain altitude, but only the design of the wings assured directional stability.

Project members believed that thousands of these easily mass-produced weapons could annihilate a city or an industrial complex in a matter of moments if launched in a massive attack formation. Most of the Army’s high command remained unaware of the weapon’s development until official demonstrations were held in October 1918.

During the first official test held in Dayton, Ohio, near McCook Field, the miniature craft



lifted into the air on cue. Then the slowly climbing aircraft deviated off course, swooped, and dove like a kite flying without enough wind, heading straight for the reviewing stands. The distinguished crowd dove haphazardly under the bleachers preparing for disaster. Arnold recalled, “At about six to eight hundred feet, as if possessed by the devil, it turned over, made Immelman turns, and seeming to spot the group of brass hats below, dived on them, scattering them in all directions,” much to the embarrassment of the Liberty Eagle development team.

Fortunately, the craft crash-landed a few hundred feet from the invited guests.

A small trophy fashioned from the main gyroscope and a fragment of the wing is preserved as part of the Smithsonian’s National Air and Space Museum collections.

Orville Wright, C. Harold Wills, Elmer A. Sperry, Robert A. Millikan, and Kettering were all members of the team—a collection of accomplished scientists and engineers. Wright remained active in aviation technology his entire life and was frequently consulted by Arnold when he faced any difficult problem. But neither Arnold





Photo from the Robert & Kathleen Arnold Collection

Left: Arnold as commander of US Army Air Forces. Above: The B-10 that a member of Arnold's team crashed into Cook Inlet in Alaska during an expedition to photograph the Alaskan coastline. Arnold took full responsibility for the mishap.

nor the Liberty Eagle ever flew in combat and the top secret project went dormant shortly after the end of World War I. As commander of USAAF during World War II, Arnold resurrected the project as a small craft resembling a Cessna. That unmanned project evolved into the clandestine Weary Willy-remotely piloted bomb project. In 1944, Weary Willy bombers and television-controlled glide bombs were actually used against Axis targets in France.

Arnold's innovative alternate uses for aircraft continued while serving at Rockwell Field, San Diego, in 1923. That June, Arnold ordered four lieutenants to flight-test a basic air refueling method. In a search to increase the combat range of pursuit airplanes and bombers, Arnold approved the dangerous and potentially revolutionary experiment in aviation operations: midair refueling.

Audacity and fearlessness played a larger role in the success of the trials

than the machinery involved, since it consisted of nothing more than hoses, ropes, and gas cans. Lt. Frank W. Seifert and Lt. Virgil S. Hine achieved two successful contacts in a modified DH-4 aircraft. A second, even more successful test occurred in August.

Arnold had no doubt of the critical importance of aerial refueling, still considered a stunt by most of the general public and many aviators. Arnold's Rockwell Field "Holiday Greetings" letter not only highlighted the tests but made a subtle political statement as well. "In performing the two aforementioned flights Rockwell Field presented to the world a new mode of replenishing gasoline and oil supply of an airplane while in flight," Arnold stated. "While the great benefits to be derived from refueling in the air are probably unappreciated at this time by many people in aviation circles, it can only be a matter of a few years until the pioneer refueling work done at this station will be the basis for operating airplanes on long cross-country flights whenever it is needed to carry great loads or carry materiel or personnel to greater dis-

tances than the capacity of gas and oil tanks will permit."

Personal Tragedies

In his youth, Arnold's mother Anna ("Gangy") was attentive to the children, while his father Herbert ("Daddy Doc") made his rounds as the town physician. She was with Arnold at pivotal moments in his life—the most memorable being his unexpected commissioning into the infantry in 1907. Gangy usually called her son by a pet name—"Sunny."

This name carried over into his marriage to Eleanor ("Bee") who had affectionately called him Sunny since the days of their courtship. This was not surprising since young Arnold had taken Bee's family nickname, "Beadle," as his pet name for her. Most of her private correspondence to him began, "Dear Sunny" and his return letters were signed, "Your Own, Sunny."

In the midst of the remarkable accomplishments of the 1923 refueling trials, tragedy struck the Arnold family as their third child, William Bruce, contracted a nearly fatal case of scarlet fever. Then, inexplicably, Arnold's fourth child, two-year-old John Linton, became ill and



Above: Arnold wrote six Bill Bruce adventure stories. The series was named after his third son. **Right:** Arnold (r) flew his first 28 sorties with Arthur Welsh (l), his instructor. Welsh was killed in a 1912 crash of a Wright Flyer C.

suddenly died. It was later determined that he had suffered a ruptured appendix.

The death struck the Arnolds with tremendous force. Arnold had his work to occupy his time and mind, but Bee had the children and they were her life.

Eventually, John Linton's death was too much for Bee to handle on her own. By May 1924, she had retreated to the family home in Ardmore, Pa., to recover psychologically from the loss of her child.

It took almost a full year before Arnold could face his own feeling of loss. On June 2, 1924, he wrote to his wife. "We all miss you very much [Beadle] and in addition I, somehow now more than for some time, miss the presence of John Linton's sunny smile."

Arnold, with the expert help of a nursemaid, kept the other children out in California allowing Bee to recuperate in peace.

Shortly thereafter, he wrote and published several boys adventure books about pilots and flying and named the hero after his middle son. In all, he wrote six "Bill Bruce" books, from 1926 to 1928, and earned about \$200 for each one. He also wrote books for his other two living sons—Henry H. Jr. and David—that were never published.

Arnold made important contributions to the ground forces during this time at Fort Riley by indoctrinating cavalry offi-

cers in the potential of airpower. While serving at the Cavalry School at Riley, Arnold decided to commit to Army life despite becoming eligible to retire after 20 years of military service. The crumbling economy may have influenced his final decision, as the global depression precipitated a second personal tragedy in the Arnold family.

Economic pressures on Arnold's parents, Daddy Doc and Gangy, had become overwhelming. Their life savings were lost when banks collapsed in 1929.

Sunday morning, Jan. 18, 1931, at 7 a.m., Gangy woke as usual but soon experienced severe chest pain. She alerted Daddy Doc to her deteriorating condition, but even his expertise as a physician could not save her. By 7:20 a.m., she lay dead, stricken by a massive heart attack.

Arnold, feeling tremendous guilt that he had missed his parents' golden wedding anniversary the previous spring, rushed to his father's side. After the funeral, Daddy Doc fell into a deep depression and never recovered from his wife's sudden death.

Arnold's mother's death had a deep and lasting impact. In the months following her death, the letters to and from his wife changed. Beadle, recognizing that the nickname Sunny would be a constant reminder of his mother's death, changed his nickname to "Hap"—an abbreviation of "Happy." Only after Arnold's mother died in January 1931 does "Hap" appear in his daily correspondence, establishing the nickname he carried for the rest of his life.

By May 1931, Arnold had altered his personal signature from Harley "Sunny" Arnold to "Hap" Arnold. As with other traumatic events in Arnold's life, he never spoke of it openly.

The year 1934 brought new highs in his military flight accomplishments. Arnold led a flight of new Martin B-10 bombers that flew round-trip from Washington, D.C., to Fairbanks, Alaska. The first all-metal, low-wing, retractable



gear monoplane, the B-10 was the most technologically advanced aircraft in the Air Corps inventory.

The expedition staged sporadic photo operations out of Fairbanks and Anchorage for two weeks. Arnold even found a few hours to lay over in Juneau to accept a totem pole from the mayor of the city. Additionally, the aviators successfully photographed a sizeable portion of the Alaskan Territory, including the archipelago, despite clouds and low ceilings. The only glitch in the mission occurred on a flight out of Anchorage.

On the morning of Aug. 3, rain clouds broke and an opportunity to photograph some terrain presented itself. Arnold recounted the events of the day to Beadle.

“Everything went along well until Bobzien [a member of the photo team, not one of the regular crew] took off. His engines both quit soon after takeoff and he landed in Cook Inlet. No damage to the plane other than saltwater or injury to personnel other than a good wetting. [However, Arnold later found out that Sergeant Bush had broken his leg in the ditching.] We are salvaging the plane now. However, I doubt if the plane will ever be used again on account of the saltwater bath.”

The pilot had mishandled the fuel control switches and cut off the fuel to the engines. The decision to allow

a pilot from outside the mission team fly the B-10 was one Arnold regretted and took responsibility for. Nowhere in Arnold’s correspondence did he lay blame elsewhere for the accident, not even upon the inexperienced pilot.

The working airplanes returned to Fairbanks to complete their photo mission, and Arnold left a mechanical crew in Anchorage to get the damaged airplane in working order if possible. The ditched B-10 rejoined the rest of the contingent at Fairbanks one week later.

DFC and Mackay No. 2

The mechanics had not only saved Arnold’s reputation after he had made a bad decision, but had also saved the Army Air Corps considerable public embarrassment. To Arnold, those young men were heroes in more ways than one. With one month’s preparation, Arnold had taken his aircraft nearly 8,000 miles, in constant radio contact with the ground, with only one major foul up, and no aircraft losses along the way. The round-trip distance to Alaska was 7,360 miles, but aerial mapping missions were flown while deployed there, in addition to a flight to March Field, Calif., and then back to New York shortly after their return to Washington. The total mileage flown on the mission, according to Arnold’s trip diary, was 18,010 flight miles at an average speed of 168 miles per hour.

The success of the mission earned Arnold the Distinguished Flying Cross and a second Mackay Trophy, and it proved long-range bombers could threaten once impenetrable and isolated territorial boundaries.

President Roosevelt wanted to see Arnold afterward, so Hap hurried to the White House. During the 10-minute meeting, FDR offered congratulations on the success of the Alaska mission and asked a hundred questions about the Yukon.

The meeting was Arnold’s first alone with the President. Feeling proud and relieved, and with brand-new B-10s under his command, Arnold returned to March Field.

Arnold’s flight experience began almost as early as the very first flying machine. His life spanned the evolution of American airpower through the development of the first jet fighters.

He lost friends to flying accidents and aerial combat. He lost his toddler son to a medical condition that went undetected by medical tools of the times. The same was true when his mother suffered a heart attack. His understanding and belief in the positive aspects of technological change was far beyond the reach of most of his Army contemporaries. A tremendous catalyst to this process was his close personal association with America’s scientific, industrial, and academic communities.

At times, he placed too much faith in the possibilities of science and on more than one occasion hung his hopes on pipe-dream technology, but more often than not, his imaginative ideas were realized.

Theodore von Kármán, the man Arnold had personally selected to lead the AAF into the technological future as head of the Scientific Advisory Board, wrote on the occasion of Arnold’s military retirement: “You certainly know that I always admired your imagination and judgment, and I believe that you are one of the few men I have met who have the format to have at the same time your feet on the ground and your head over the clouds—even on days when the ceiling is rather high.”

Arnold’s dedication to scientific knowledge and pursuit of technological development was the product of a lifetime of operational flying experience. Yet he realized that making decisions regarding science and technology required careful thought and was a by-product of all of life’s experiences. Arnold made it perfectly clear that even possessing the finest of mental or physical qualities could not guarantee success in operations or command.

In 1947 he wrote, “When it comes right down to ‘brass tacks,’ however, in the military field, as well as in other fields, it would seem to be a man’s native ability that spells the difference between failure and mediocrity, between mediocrity and success. Two men may work equally hard toward a common goal; one will have just that ‘something’ the other lacks. That puts him at the top.”

Arnold realized that he, among a fortunate few, had one quality that could not be learned or taught. Hap Arnold described it as “the intangible—the spirit of a man.” ■



Photo via Library of Congress

Dik A. Daso is a retired F-15, RF-4, and T-38 pilot and former curator of modern military aircraft at the Smithsonian's National Air and Space Museum. This article is derived from his book, Hap Arnold and the Evolution of American Airpower. Daso's most recent article for Air Force Magazine, "The Red Baron," appeared in the March 2012 issue.