"To profit by our experience, all the major components of ship three were modified or replaced," Young related. "This included the mast, bar control system, and ground gears in the transmission."

Charged with enthusiasm, Young and his associates started assembly work on the new helicopter.

"We rolled the first Model 47 out on December 8, 1945, less than six months after the Gardenville group arrived in Niagara," Young said. "Things went fast, because we'd gained considerable 'how-to' from our Model 30 testing."

It wasn't long before 10 additional aircraft were produced. They would be used for demonstrations, training people to fly and as product improvement vehicles.

Floyd Carlson, who was then chief pilot, tells about the certification program.

"The Civil Aeronautics Administration (now the FAA) had never certified a commercial helicopter and Bell had never experienced certification of a helicopter, so we both had a lot to learn.

"CAA cooperation couldn't have been better. Since we were going after the first commercial helicopter, the CAA sent its best people in from Washington, D.C. to participate in the certification. We even had the head of flight standards to supervise the flight tests.

"The CAA pilot let me do all the flying, which involved a lot of performance testing and precision manuevers. Our aircraft performed right well, especially in autorotation landings where I did throttle chops at different altitudes and speeds.

"There were no major problems during the certification. Today, it's much more time consuming. There was less instrumentation in those days and we didn't have to do such things as load surveys. Another reason we progressed through certification so rapidly was that we'd done so much flying in ship three, which was a similar aircraft.

"At the time, we were also in a race with Sikorsky to receive the first commercial ticket, so we had yet more incentive to achieve a successful flight program."

It happened on March 8, 1946!

This was the day when the Model 47 was awarded the world's first commercial helicopter license. It was a day that Young described his emotions as "feeling like a combination of a bridegroom at a wedding or a father in a maternity ward."

"Even though it didn't look as sleek as management wished, the homely machine won the day," added Bart Kelley. "It was a story with a happy ending like 'The Ugly Duckling'."

Chief Pilot Floyd Carlson demonstrates the stability of the Model 47 on Mar. 8, 1946, the day Bell was awarded the first commercial helicopter license by the CAA.

The Model 47's story was a long one. During it's 27-year manufacturing history, over 5,000 commercial and military versions came off the assembly line. When the series was retired in 1973, the machine had been made in more than 20 different configurations and manufactured under license in Italy, Japan and England.

What became of the Model 42? Young and Kelley eventually got the bugs out of the ship and it was displayed at a Cleveland air show in December 1946. Sharing the spotlight was a streamlined cabin type Model 47 and the "ugly duckling" bubble bird.

"People swarmed all over the open bubble job and wouldn't touch the Model 42 with a 10-foot pole," Young said. "The customers just wouln't accept it."

Summing up the accomplishments of Arthur Young, his life-long friend, Bart Kelley said:

"Arthur is not only credited with inventing the world's first commercially practical helicopter, but he has many other talents as well.

"He has recently published four books expounding his new and convincing philosophies. Arthur is also a poet and painter, a talent he inherited from both parents.

"As a boy, Arthur was a ham radio operator. Those were the days when you couldn't buy whole black boxes ready to plug in. He built his own set from scratch, station 3BEC.

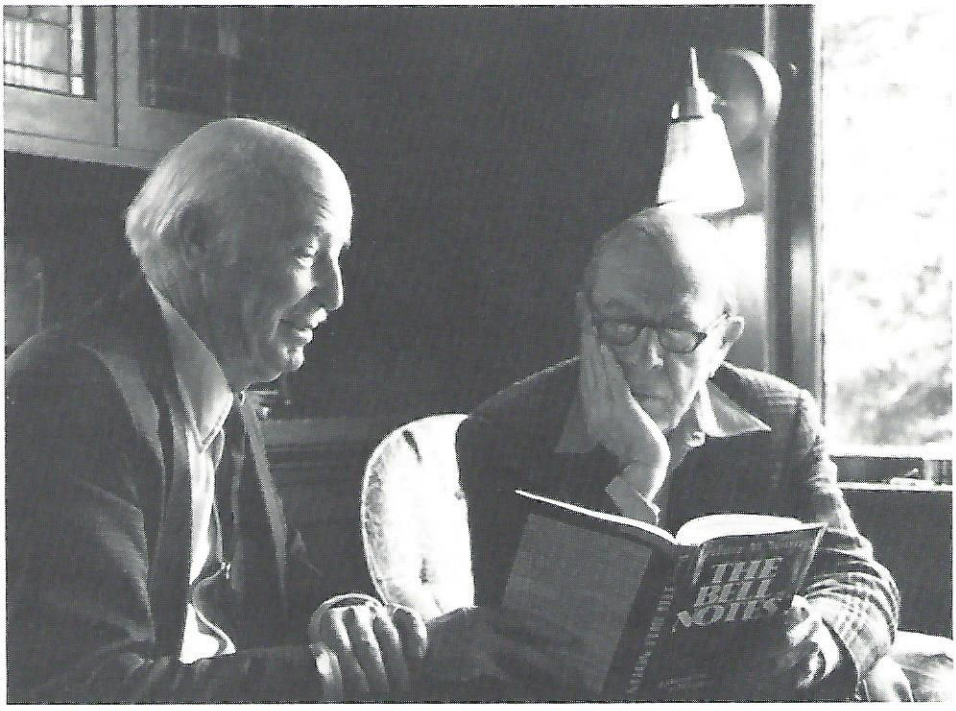
"But a list of accomplishments has little meaning without a knowledge of the character of the man.

"Arthur's is an original and penetrating mind. He is always suspicious of the establishment — the conventional approach — whether it be in science or engineering.

"As the most intellectually honest person I know, he can be as hard on himself as he can be impatient with stupidity and artificiality in others. This hasn't always made him easy to deal with, but in the end his uncompromising respect for truth stimulates those around him.

"Add a delightful sense of humor, born of his ability to look objectively at life, and you have a thumbnail sketch of the inventor of the Bell Helicopter." □

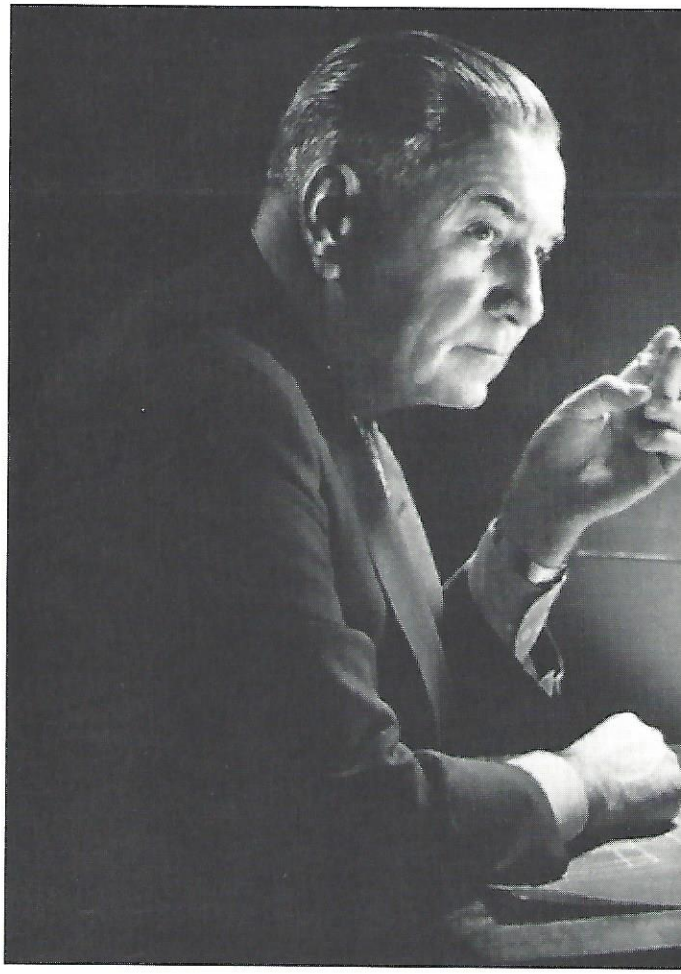
Young poses in Ship 1 shortly before it was transferred to the Smithsonian Institution in May 1964.



Bart Kelley, left, reminisces about the early days with inventor Arthur Young at Young's Institute for the Study of Consciousness at Berkeley, Ca.

Larry Bell

. . . aviation trailblazer



If you knew Lawrence Bell, you called him Larry.

He liked to keep in close contact with employes by periodically visiting production lines and having a friendly chat with his workers.

His confidence was contagious. He believed he could do almost anything he set out to do and usually did. This philosophy inspired engineers to overcome goals they thought were impossible.

As a monument to his leadership and visionary ideas, the company produced a long line of revolutionary aircraft, including:

- The Airacuda — the fastest airplane (300 mph) flown by the U.S. Army when it was introduced in 1937.
- The P-59 Airacomet—the U.S.A.'s first jet powered airplane.
- The P-39 Airacobra World War II fighter, incorporating milestone innovations such as a rear engine installation and a 37-mm cannon which fired through the nose.
- The Model 47, the world's first commercial helicopter.
- The X-1 research aircraft — the first plane in the world to break the sound barrier.
- The X-2 — the world's fastest and highest flying manned airplane (more than 2,000 miles an hour and 126,000 feet altitude).

Sixteen-year-old Larry Bell watched in fascination as he sat in the grandstand at the country's first major aviation show at Dominquez Field near Long Beach, Calif.

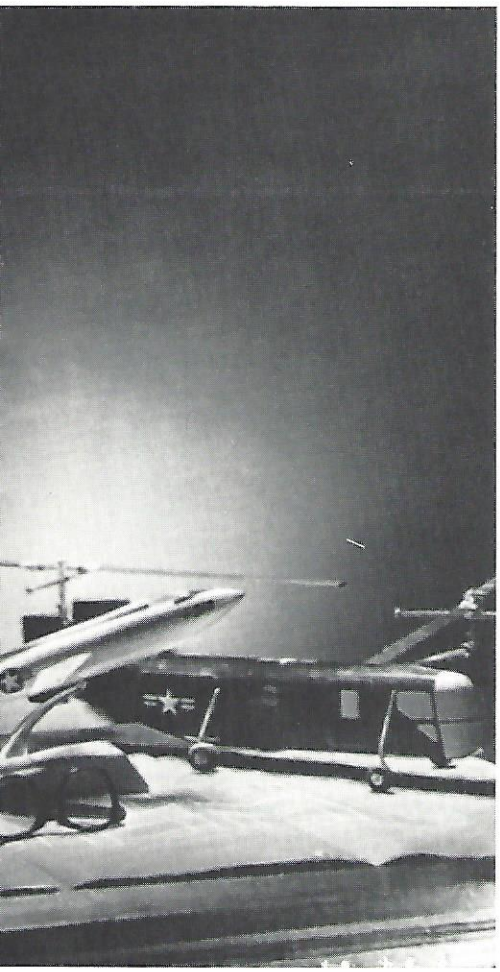
The year was 1910, just seven years after the first flight of the Wright Brothers. There were only about two dozen U.S. pilots then. One of the young aviators, Glenn H. Curtiss, set a speed record during the Dominquez show. Flying with one passenger, he reached the amazing speed of 55 miles per hour in his aircraft!

The youngster was so excited in seeing his first airplane that as soon as he returned home, Larry and his brother, Grover, used bits of wood and fabric to build a wooden kite model which resembled a box-like plane. This was his first crack at airplane manufacturing and his prototype flew.

During those infant days of aviation, Larry was attending Santa Monica Polytechnic High School, concentrating in mechanics and woodworking. In his spare time he read everything about aviation he could get his hands on.

In the meantime, Grover, who was 11 years older than Larry, was pursuing a career as a pilot. After taking flying lessons at the Glenn L. Martin Aircraft Company in Los Angeles, he was hired by the firm as an exhibition pilot and instructor. To give you an idea of how aviation has progressed, the Martin Company was listed in the telephone directory under "Amusements".

In the weeks ahead, Grover gained a reputation as one of the best aviators on the West Coast. In 1912 he sold some farm land and bought his own machine — a used Martin pusher biplane. During his off hours from the Martin Company, he would



perform aerial exhibitions with Lincoln Beachey, a daredevil pilot.

An exhibition pilot could make pretty good money in those early years — participating as a stunt flyer at aviation shows and fairs. Those flying events also gave the fledgling aircraft manufacturer an opportunity to promote the products.

One of the biggest moments of Larry's young life occurred when Grover asked him to join the exhibition team as a grease monkey. The invitation came shortly before his graduation from high school, so he made special arrangements, took his final examinations early and passed with flying colors. This was the end of Larry's formal education.

His first aviation job was far from glamorous, but he liked the work and admired flamboyant and fearless aviators like Beachey who made "death dives" from 5,000 feet.

Touring with the team was a rugged life. Larry might be spending the night in a tent at one show and sleeping on the ground of a field at the next engagement. But he didn't seem to mind. He was learning something new about aviation every day.

During those tours, Larry and Grover sometimes talked well into the night about setting up a manufacturing company and introducing a new airplane. The brothers' plans were for Grover to raise the getting-started money through exhibition tours. Then Larry would organize and run the production.

July 4, 1913, at a flying exhibition near Petaluma, Calif., Larry watched as his brother climbed to 3,000 feet. Suddenly, blue smoke poured from the engine and Grover's aircraft began a rapid descent. A few seconds later, he seemed to have the situation under control until he was about 20 feet from the ground. A band of horses ran in front of the aircraft! Swerving to miss them, he opened his engine to clear a clump of trees. But he was forced back, causing a wing to strike the ground. The airplane was smashed to bits.

Grover died the next day at a local hospital.

His brother's death was a terrible blow to Larry. Aviation, which had been his love, he now looked upon as an enemy. Adding to his grief were the curiosity seekers who had salvaged bits of the downed aircraft for souvenirs. With this tragedy plaguing him, Larry decided to quit his aviation career.

A move toward greatness

Lawrence Dale Bell was born in Mentone, Ind, on April 5, 1894. He was the youngest of 10 children of Isaac and Harriet Bell.

Isaac, a lumberman, retired in 1907 and moved from Indiana to California so he and his wife could be near their grown children.

The move brought Larry into the world of aviation and launched him on a phenomenal career.

Larry not only liked people, but he had a strong affection for animals. Here he plays with a calf and a dog at his parents home in 1914.

The loss of Grover haunted Larry for several months. He thought of getting into another occupation, but he couldn't shake his enthusiasm for aviation.

Time, however, proved to be a good healer, because he eventually took a position as a stockroom clerk in Glenn Martin's aircraft factory, the firm that had built his brother's plane.

Larry tackled his new job with enthusiasm and determination. He was not only a likeable individual, but he was hard working and offered numerous suggestions on how to improve the operation.

He made such an impression on Martin, in fact, that Larry was soon put in charge of the tool room. At the age ot 20, he was appointed shop foreman.

Even at this young age, Larry had a flair for coming up with ideas that paid off.

To keep his company going and meet a payroll of about 30 employes, Glenn Martin would often stage daredevil flying exhibitions on weekends.

Larry had recalled reading about experimental aerial bombing tests made in 1911, so he recommended to Martin that the flying team stage a big two-day spectacular called "The Battle of the Clouds". Martin bought the idea.

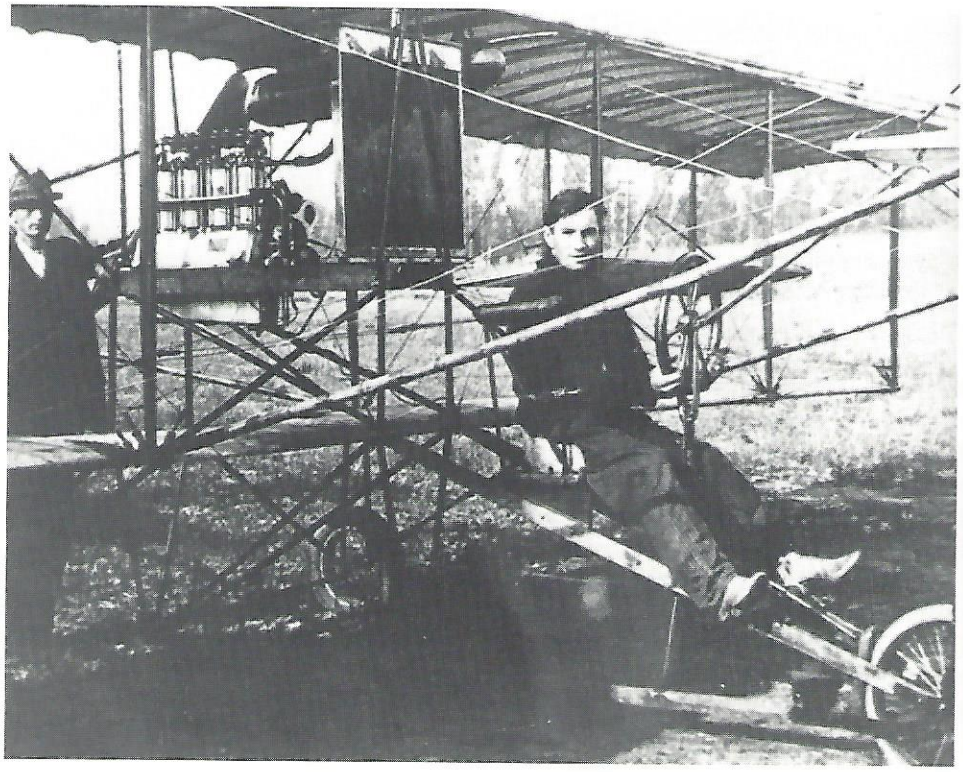
The set was a crude wooden fort and a mock battleground. When Martin flew over the target, he dropped oranges like miniature bombs. To produce the effect of an explosion, Larry — concealed on the ground — set off black powder charges and dynamite. For added realism, he would pull down sections of the small fort as the powder exploded.

This 1914 exhibition was a show stopper and brought in so many spectators that Glenn and Larry had to use a big potato sack to haul away the money that had been accumulated from the one dollar each admission fee.

The show had also attracted the attention of two mysterious looking men who visited Martin's shop shortly after the performance.

It turned out they were emissaries from the Mexican revolution. Pancho Villa, it seems, was currently in exile in the U.S. and had read about the "Battle of the Clouds" in the L.A. newspapers. Would the Martin Company build a bomber to aid their cause?

After he'd seen his first airplane at a flying show in 1910, Larry (lower left), built his first model with the assistance of Grover, center.



Larry joined his brother's exhibition flying team in 1912 as a mechanic. Here, Larry is shown at the wheel of Grover's pusher biplane.

Climbing up the ladder

Needing the business, Martin immediately quoted a price of $10,000 and promised delivery in two weeks. Without batting an eye, one of the men opened a suitcase and handed him the cash.

It was Larry's job to create and construct the bombs for the aircraft which was a modified two-seat Tractor biplane that had been used in exhibition flying. By using gas pipes filled with dynamite and detonator caps, he came up with some crude but effective "eggs".

So at the ripe old age of 20, Larry had a big hand in helping build the world's first combat bomber. The sale plus the receipts from the "Battle of the Clouds" gave the Martin Company a financial boost and paved the way for the production of other bombers to friendly nations.

There was no end to Larry's ingenuity or confidence. One day a Japanese army officer visited the facility and requested flying lessons. All the pilots were performing at an exhibition. Larry promptly gave him instructions from the ground (trainers then only had one seat), watched him solo successfully and collected the $500 fee. What the officer wasn't aware of was although Larry knew all the fundamentals, he had never flown a plane! He did learn to fly three years later, however.

His drive and ambition pushed him further up the ladder. By the time he was in his early twenties, Larry was superintendent of the Martin plant. When Martin opened a new plant in Cleveland in 1917, the youthful Bell was promoted to manager and supervisor of the facility.

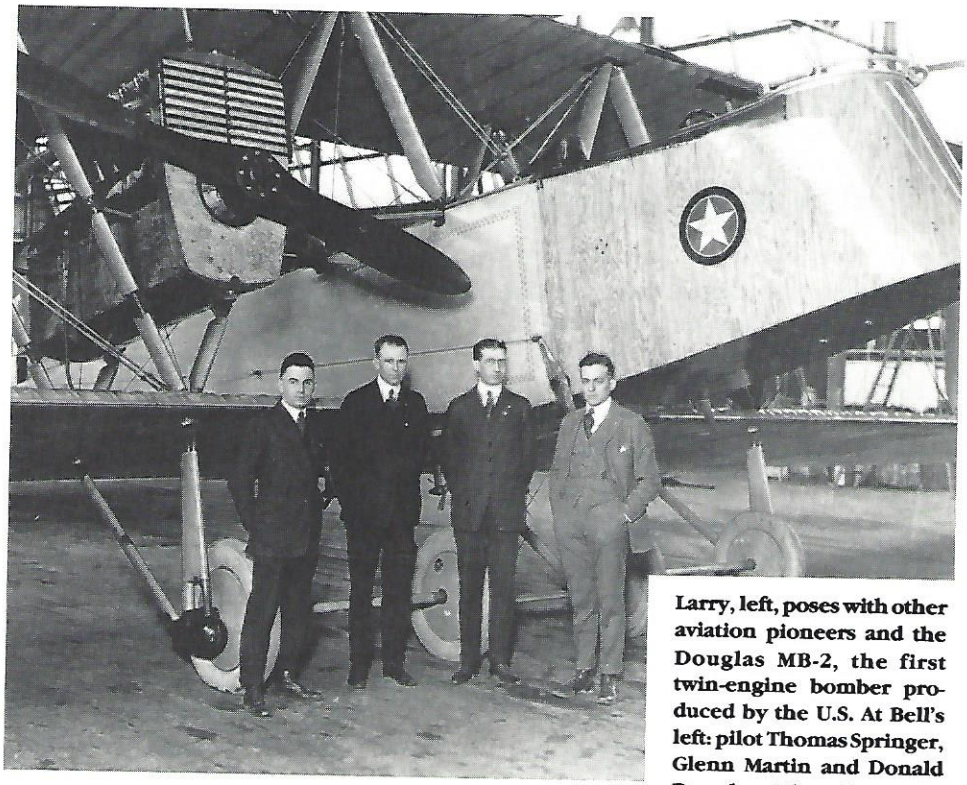
Larry is also given credit for hiring two men who later would be giants in the aviation industry — Donald W. Douglas and J. H. "Dutch" Kindelberger. Douglas, who of course, became a leading builder of transport airplanes, was the first man to be hired specifically by an aviation company as an aeronautical engineer. Kindelberger, who went to work as a draftsman for Martin, was destined to become president of North American Aviation Co. Larry knew talent when he saw it.

The genius of Douglas was apparent almost from his beginning with Martin. His design of the Martin MB-2, shortly after World War I, resulted in the first twin-engine bomber produced in the U.S. This was the aircraft that General Billy Mitchell used in 1921 to prove that bombers could sink battleships. Larry was also instrumental in the success of the MB-2 through his participation as the major plant contact with the U.S. Army.

By the mid Twenties, Bell, only in his early thirties, had been elevated to vice president and general manager of the Martin Company. It would seem like the perfect American rise to success story.

But Larry was unhappy with his association with Glenn Martin. Through the years, Martin who was aloof and formal, had counted on Larry s extroverted personality and dynamic sales ability to finalize many key transactions. Because of his many contributions, Larry had reached a point where he felt an ownership share in the organization was in order.

When Bell approached Martin with his proposal, he received a very firm "no". Larry countered by making a firm decision to leave the company.



Larry, left, poses with other aviation pioneers and the Douglas MB-2, the first twin-engine bomber produced by the U.S. At Bell's left: pilot Thomas Springer, Glenn Martin and Donald Douglas. The photo was taken about 1919.

A company of his own

Bell didn't exactly select the most appropriate time to quit his job with Glenn Martin, but he had strong principles and nothing could sway him from his decision.

In January 1925, Larry and his wife, Lucille, moved from Cleveland to Los Angeles where he thought he'd find a better opportunity. The aircraft industry, however, had fallen to a low point and there were no immediate positions open to even seasoned executives.

The next three years must have been extremely frustrating for a man who still had an intense desire to start his own business. During this period he sold machine tools and tried to get a financial boost by investing in an unsuccessful quest for a lost gold mine.

Finally in 1928, he hit a payload with a job offer from Maj. Reuben H. Fleet (U.S. Army, Ret.) president of Consolidated Aircraft in Buffalo. The company was involved in pioneering a flying boat, the PY-1 amphibious aircraft. This was the forerunner of the PBY Catalina that earned its stripes in World War II.

Unlike Martin, Fleet agreed to give Larry a strong voice in the company as well as a lucrative stock option arrangement. Bell's drive hadn't slowed a bit. Signing on as sales manager, he was appointed vice president and general sales manager just a year later.

Larry enjoyed his position, had a good relationship with Fleet and might have stayed with Consolidated if the company hadn't decided to relocate to San Diego in 1935 to permit year-around flight testing.

The move meant that an unemployment void would be felt by the citizens of Buffalo in these depressed times. Larry saw this change of events as an opportunity to launch his own company and fill the loss of one of the city's major industries.

Bell's plan was encouraged by city officials and he received strong support from the local press.

With two former Consolidated executives, Ray Whitman and Bob Woods, Larry began raising funds in July 1935 to form Bell Aircraft Corporation. The company was to be capitalized at $500,000 with a cash minimum of $150,000. Stock was offered at $100 a share.

One of the big catches was that the $150,000 in cash had to be in hand by September 1, only two months away. That's because Bell had an understanding that no subscription would be binding unless the starting capital was raised by this date.

Pooling their resources, the group came up with $90,000. Where was the additional $60,000 to come from?

Larry turned on his dynamic sales personality and began to knock on doors. To prove he was fit, he even did pushups by the request of a prospective but skeptical investor. The target sum was eventually raised to meet the deadline.

Bell was not only a fund raiser, but a shrewd trader. A total of $35,000 had been allocated for tools and equipment. First, he took $17,000 of this money and purchased tools from Consolidated. Larry then offered Major Fleet one buck for everything Consolidated felt would be uneconomical to move to the West Coast. Fleet accepted the offer and for $1 Bell was the owner of various odds and ends and just plain junk. From this assortment, he selected what he needed and sold the remainder for $17,000. Not a bad transction.

To begin manufacturing operations, Bell rented 40,000 square feet of factory space in Consolidated's former plant. There were about 56 employes. Projects were few such as making radio masts under subcontract to local firms. Business was pretty slow until February 1936 when Bell Aircraft received a $800,000 Navy contract to make PBY wings and parts for Consolidated.

In the meantime, Larry's idea for a new military plane was taking shape in the experimental shop. This aircraft, the Airacuda, was a twin-engine, long-range fighter. With its two 37mm cannons and four 50 caliber machine guns, it was a flying gun platform with tremendous firepower. It was the first all-Bell plane and the first to use remote control gun turrets.

This 'ahead of its time' flying weapon was superceded within a year by the P-39 Airacobra — a smaller, faster cannon-bearing Bell fighter which saw wide use on the battlefields of World War II. It was the first American fighter plane designed around its armament.

In a July issue of Bell Aircraft News that commemorated the 15th anniversary of the company, Larry authored an article with these observations:

"The first five years were difficult years, despite the fact that we brought out two revolutionary new military aircraft, the Airacuda and the Airacobra. Only a few experimental models were sold — and these at a loss.

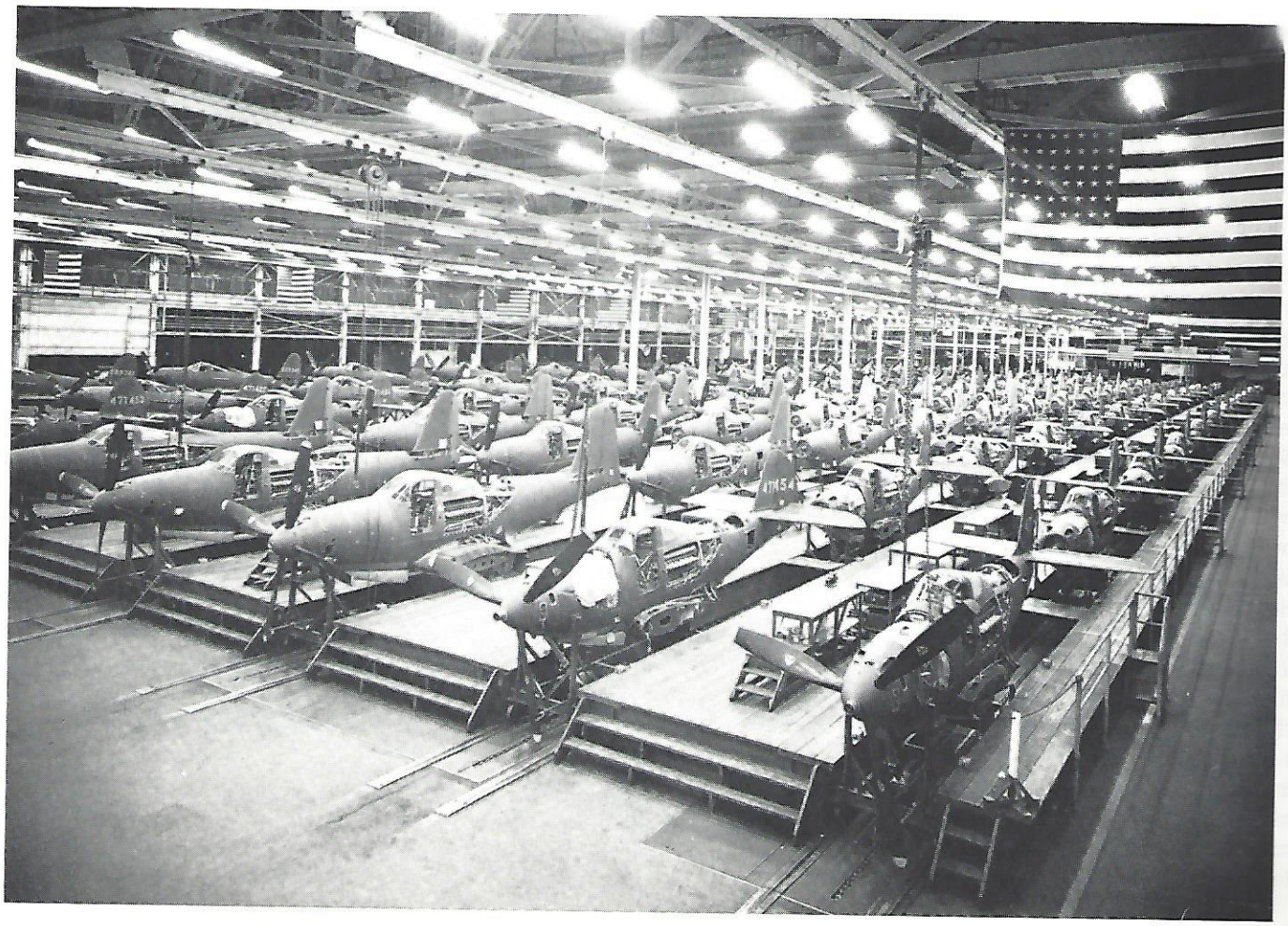
"There were times when the problems appeared insurmountable and there were some weeks when we didn't know whether we'd be able to meet the payroll. But we always managed to face the challenge, largely through the sheer will to do it plus a spirit of cooperation that defied defeat.

"By the end of 1939, we began to see daylight and our first important order came from France in April 1940 for 200 Airacobras. But by June, France had fallen to the Nazis and we faced another blank wall. Britain took over the French order, however, and almost immediately increased the contract to 810 Airacobras."

Production of the fighter pushed employment up rapidly and, by 1944, Bell Aircraft had more than 50,000 workers at plants located in Buffalo, Niagara Falls, Burlington, Vt. and Marietta, Ga.

During the war years the plants at Buffalo and Niagara Falls were engaged primarily in turning out fighters. These included the Airacobra, its successor, the P-63 KingCobra and the P-59 Airacomet, the nation's first jet-propelled airplane. In addition to fighters, Bell also built the B-29 Super Fortress, turning out about 650 of these ships.

Another unique product was the XF77, an all-wood interceptor fighter, developed and built by Bell for the Air Force, when an aluminum shortage threatened fighter production. The XF-77, incorporating an airframe made of Sitka spruce, made a successful test flight in 1944, but was never produced.



During World War II, Bell Aircraft turned out thousands of P-39/P-63 fighter planes at the Niagara Falls plant.

The helicopter ... an ace in the hole

Larry and his company received practically every type of award for war production. One of the most prestigious was the 1944 Daniel Guggenheim Medal for "achievement in design and contribution of military aircraft and for outstanding contributions to the methods of production." Bell's high school diploma was also supplemented by an honorary degree of Doctor of Science from Hobart College, N.Y.

If it hadn't been for Larry's foresight, there might never have been a Bell Helicopter Company. At the beginning of the war, he decided to hire a young man named Arthur Young who had invented a helicopter. Larry envisioned an opportunity that would have to be delayed by the war but that someday might yield a large dividend.

Young and his small staff were set up in a garage rented in a suburb of Buffalo, completely divorced from the company's all-out war efforts. The Bell helicopter wasn't quite ready when World War II ended, but in September 1945, Bell announced that his company would enter the post-war helicopter field.

Larry was very wise to have a promising ace in the hole because after V-J Day in August 1945, almost all of the company's business was canceled. From a high peak of $317 million in 1944, Bell's business shrank to $11 million in 1946. The work force dropped to 2,920.

Before the firm turned its almost complete attention to helicopters, however, it added another extraordinary chapter to aviation history.

Since 1943, Bell Aircraft had been working on the X-1 research plane, another dream of Larry's. It was the first airplane in the world specifically designed to break the sonic barrier or fly faster than sound (1,700 mph at an altitude of 80,000 ft.).

Larry had counselled his engineers to throw away the books, because in super sonic aircraft, there would be no previous aircraft standards.

On October 14, 1947, a Bell B-29 bomber carried the X-1 aloft and dropped it from a bomb bay. Powered by four rocket engines, it was flown by Capt. Charles E. "Chuck" Yeager, a U.S. Air Force test pilot. Capt. Yeager became the first man to fly faster than the speed of sound.

For this feat, Bell, Yeager and John Stack, a government scientist, received the coveted Collier Trophy from President Harry S. Truman in the White House. This trophy, the nation's top aeronautical award, is presented annually for the "greatest achievement to aviation in America."

Later, the X-1 was presented to the Smithsonian Institution by Gen. Hoyt. S. Vandenberg, chief of staff of the U.S. Air Force.

"I consider the X-1 the most convincing evidence of our ability to discover and control the forces of nature since the original Wright plane," Gen. Vandenberg said in tribute to the accomplishment.

It was reported that the whole X-1 project might have been abandoned or shelved had it not been for Larry's unwavering conviction the aircraft would succeed.

While Bell was not an aeronautical engineer nor was he a production wizard, he had that rare quality of leadership which inspires dreamers to dream and hard-headed mechanics to convert these dreams into hardware.

Bell would use this brand of leadership to establish a company that would become the leader in the helicopter industry.

Captain Charles (Chuck) Yeager and Larry Bell are congratulated by President Truman on winning the Collier Trophy (shown in background) for the X-1 aircraft.

Faith in the future of rotary wing

On Sept. 10, 1943, Larry Bell presided at an executive staff meeting. Here are excerpts from that address:

"We have not announced it, but we have been very successfully flying a helicopter. The second one will be ready in another week.

"About two years ago we made a deal with a man named Young who was working on helicopters. He is a typical inventor, a fine young man about 35. For 12 years he experimented with helicopters, when he discovered he had to have a Purchasing Department, Legal Department, Manufacturing Department, and so on, and we made a deal and a contract to fly two helicopters. One has been flying since April and the other will fly next week. We are in that business and we are in it to stay. We have some patents that are valuable.

"We expect to go into that, and many other things after the war. It is silly to think that the helicopter is something your grandmother could fly, but if you saw that kid (Arthur Young) do it, you would be convinced that your great-grandmother could fly it.

"We believe that it is one of the great things of the future — one of the world's greatest future industries."

Despite the demand of his time during the war, Larry made frequent trips to a rented garage in the Buffalo suburb of Gardenville, N.Y. where Young and his small staff were developing the experimental Model 30 which would lead to the Model 47 helicopter.

Among the Gardenville group who "grew up" with the helicopter and became closely associated with Bell were Floyd Carlson, the company's first rotary wing test pilot and Joe Mashman, Floyd's assistant.

"I became acquainted with Larry at the Buffalo Aero Club before I joined Bell," said Carlson. "He made numerous speeches about aviation which impressed me, because he was sincere and gave some good sound thoughts on where aviation was going.

"One thing he had especially strong feelings about was the future of rotary wing in the aviation industry. He showed it, too, by backing our helicopter operations one hundred percent. Larry was extremely tolerant, aware of our problems and made sure we got what we needed.

"He was also a tremendous salesman and did everything in his power to promote the helicopter — thoroughly convinced that it would keep the company in business after the war.

"To promote the machine, he would ask me to give people a ride who were in the area on business — everyone from top military brass to foreign visitors."

Mashman, who became a member of the Gardenville staff in 1945 after serving as a fighter plane test pilot for Bell Aircraft, recalled the early years with Larry Bell.

"In those days the helicopter was considered to be a crazy idea that Larry had embarked on," he observed. "Our fixed wing chief engineer didn't believe in it . . . our engineering test pilots didn't believe in it, and shortly after I started

Larry touches the nose of the Bell Model 30 as Floyd Carlson hovers the machine in a field near the Gardenville facility. Inventor Arthur Young is at extreme left. Photo taken in August 1943.

working at Gardenville, I began to realize that the only member of Bell management that believed in it was Larry Bell himself.

"One day in the Spring of 1945, he informed me that he'd arranged for senior members of management and the board of directors to visit our Gardenville facility.

"He said I want you to give them a helicopter ride and show them the capabilities of the helicopter. Frankly, I'm forcing them to come out and ride, because they're scared of the helicopter and don't believe in it. But they're part of management and they're going to have to learn to like it or they won't be a part of my management team.

"Although the seat was equipped with a safety belt, the ride wasn't too comfortable since the aircraft didn't have a protective bubble or a floor."

There were probably few complaints from the experimental passengers if they cared about their jobs.

"Someone from management once asked Larry why we were going all out on helicopters instead of concentrating on

Joe Mashman, right, gives a demonstration ride to a passenger. Mashman promoted helicopter applications all over the world.

fixed wing business when the war ended," Mashman said. "Larry responded by saying that the helicopter would be the transport of the future — one reason being that man wants to fly like a bird and not like a bat out of hell."

Larry was a constant passenger in the helicopter and pushed its use for general transportation at every opportunity. His dedication and confidence in his 'crazy idea' were emphasized one day when Carlson was flying him to a Buffalo country club for a meeting.

Shortly after they took off from the plant, the aircraft's tail rotor drive shaft broke on one of the Model 47 prototypes. Carlson safely autorotated in a field.

Larry could have easily dispatched a car to the scene for a ride to the club, but he had Carlson radio for the other helicopter so he could complete his mission.

The helicopter received an abundance of publicity prior to CAA certification, and Larry loved all the publicity he could get.

In early 1945, four fishermen were marooned on crumbling ice two miles out in Lake Erie. The Coast Guard was unable to reach two of the men and finally called for Bell and asked if they could send a helicopter.

When Carlson arrived in one of the Model 30 experimental machines, the ice near the men was too thin to permit him to actually land. But, by the most adroit maneuvering and control, he managed to hover with the landing wheels of the helicopter touching — but not resting on- the mushy ice. He maintained this position with complete stability while the first man climbed aboard. After taking his passenger to shore, Carlson flew back, repeated his performance and rescued the second man.

"Believe it or not," as Robert Ripley used to say, the men asked Carlson if he would also let them take their catch of fish on the helicopter. "No way," he said.

This helicopter rescue was an unrivaled demonstration of stability control, precision handling, ability to operate under emergency conditions, and the capability of the rotary wing aircraft to do things that no other vehicle could accomplish. For this feat, Carlson was awarded the Treasury Department Silver Medal.

Larry and wife, Lucille, look over Model 30, Ship No. 1 at Gardenville in 1943.

Floyd Carlson is thanked by two fishermen whom he rescued on crumbling ice in Lake Erie (early 1945). Carlson received the Treasury Department Silver Medal for this daring feat.

Floyd Carlson gives Larry a ride in Model 30, Ship No. 3 at the Niagara Falls Plant in 1945. To promote the helicopter, Bell was a constant passenger for trips to business meetings in the area.

What to do with 500 engines?

Larry had carefully planned ahead to keep his company alive after the war. Development programs that emerged included not only helicopters but guided missiles, electronics, a radio controlled bomb and continuation of the X-series supersonic aircraft program. Bell was one of the first manufacturers to foresee the swiftness with which post-war technology developments could create an essentially new industry.

Bell Aircraft also diversified — spinning off into non-aircraft products such as making juke boxes for Wurlitzer and creating the first motorized wheelbarrow.

Pushing helicopters was one of Larry's major priorities, however, and when at the end of World War II he announced plans to build 500 helicopters, skeptical eyebrows shot up like weeds after a heavy rain.

Leston Faneuf, who became president of Bell Aircraft after Larry's death, related:

"He needed something to retain his key people, his executives, engineers and production men, at a time when contract cancellations meant the separation of thousands of employes. He was determined to save the nucleus of his more valuable men. In addition, Larry's faith in the helicopter was firm, immeasurable."

While the helicopter was undergoing certification, Larry would periodically visit the flight line, sometimes showing up with top military brass or a politician to sell them on the merits of the machine.

"One day he arrived with a teenage boy and asked me to give him a demonstration ride," said Joe Mashman. "His visitor's name was Stanley Hiller and he'd invented and built a successful helicopter.

"About three days later, I learned that Larry had authorized the sale of a set of main rotor blades to the young man. I asked Larry why he was giving a potential competitor all the know-how on the design construction of the blades.

"He'll probably come up with some better blades," he replied, "and if my engineers are as good as I think they are, it will stimulate them to devise something even more superior."

The certification of the world's first commercial helicopter on March 8, 1946, gave birth to a new industry in the United States. It also raised the question of what to do with 500 Franklin engines that Larry had ordered to back up his goal of selling 500 helicopters?

There was no storage space at the plant to accommodate the avalanche of engines so they were housed in the factory mezzanine area. A good portion of this inventory would be a part of the mezzanine decor for some time to come, because unlike the mousetrap, crowds didn't beat a path to the helicopter sales door.

In the first place, a Model 47 was priced in the $20,000's, more expensive than an airplane. Also in the early days of the helicopter, no one was quite sure what they could be used for. Then there was the lack of demand for aircraft from the military after the war. Another negative factor was the Model 47 size — just two places with a gross weight of 2,000 lbs.

The Army was the first military branch to acquire a Bell helicopter (December 1946) and in April 1947, a delivery of 13 'copters for the Army Air Force and Navy represented Bell's largest single delivery of rotary wing aircraft to date. But the majority of helicopters sold in 1947 were purchased one at a time by newly formed charter operators, a few corporations, some flying schools, crop dusters, speculators and visionaries. Records show that from 1947 to 1950, Bell had sold only something like 175 helicopters.

Profit was yet to be made, considering that since 1941 more than a million man hours of engineering and labor, 4,000 hours of experimental flight and nearly $5 million of company funds had gone into the helicopter program. But the industry was in its infancy and better things were yet to happen, especially with the strong, guiding hand of Larry Bell and his devoted and inspired helicopter staff.

One of the first successful commercial applications for the Model 47 was agricultural work. Tests indicated that the helicopter inherently produced an ideal concept principle for dusting and spraying because it could fly slowly, weave in and out or around trees and hover motionless. Its ability to propel a stream of air downward with a pronounced swirl effect made the machine especially suited to effective dust or spray dispersion.

A locust plague in Argentina dramatically illustrated the helicopter's use in aerial applications. In September 1947, ten Model 47s began a war against the annual locust invasion. Dropping tons of chemical dust like bombs, the aircraft recorded a 98 per cent kill within six hours after application. It was the first time the locusts, which were destroying millions of dollars worth of crops each year had been stopped in that country. This victory attracted wide attention to the helicopter and resulted in future sales to Argentina and other countries with bug and insect problems.

From agricultural work, the helicopter progressed to other new fields such as powerline inspection, photography and pipeline patrol. And when it came to rescues or doing near impossible tasks in remote areas, nothing could do it like the helicopter.

In the late 1940s, plans were announced to build a multi-million dollar power plant and aluminum smelter in a wild and mountainous region 50 miles northwest of Vancouver, B.C. Taking advantage of sand bars in the river as a landing base, one Model 47 made a survey of the entire terrain in 20 hours — a task some engineers reported would have taken five years on foot. This feat opened many doors for the helicopter to enter the construction industry.

With all those engines waiting in the mezzanine, Larry had the demonstration pilots constantly on the move to show what the product could do.

In early 1947 the U.S. Army had its first big flyaway of Model 47As (HTL-1s).

One of Larry's big efforts was selling the merits of the helicopter to the military. When they'd show up at the plant on other business, he'd arrange for them to take a demonstration ride. Shown standing between Larry's handshake is Bell inventor Arthur Young.

Mashman, who had been moved up to chief demonstration pilot, flew in every environment, taking the machine to jungles, swamps, and desolate areas all over the world — any corner of the globe where there was a prospective customer.

"Larry was really our best salesman," said Mashman. "He worked just as hard as anyone to sell the concept."

Larry's special brand of sales psychology was displayed near the end of 1948 when he set up a helicopter operation on the Gulf Coast to create interest in off-shore transportation. There were no operators for that job then; crews were transported to rigs by boat.

An aggressive young president of one of the oil servicing companies saw the potential of the helicopter — contacted Larry and told him: "You're a manufacturer and should concentrate on building helicopters instead of operating them. I'd like to buy your charter business here. What do you say?"

Larry agreed and Robert L. Suggs started a company that eventually became Petroleum Helicopters.

"Getting someone interested in establishing a charter service was what Larry had in mind from the beginning," said Mashman with a smile.

Although it was a small aircraft, the Model 47 proved invaluable to the construction industry by its ability to work in remote and rugged areas.

The best mistake Larry ever made

Larry faced two major challenges in the late 1940s.

The first was in 1947 when a group of shareholders attempted to gain control of his company which had only 436,000 shares of stock outstanding and substantial amounts of cash in the bank. The situation made Bell Aircraft an attractive target for liquidation to capture the company's cash assets.

It was a tough fight, but Larry's appeal to shareholders brought in enough proxies to gain him a majority. Helicopters also played a dramatic role in this battle by flying in last minute winning proxies from the Buffalo Airport and New York City to meet a deadline.

Then in 1949, in the midst of an effort to develop new products to revitalize the company, a long and bitter strike of production workers erupted in June. The strike lasted 19 weeks and further aggravated Larry's health which had been impaired by a severe automobile accident.

Helicopters again came to the rescue. To keep some key projects going, the machines would fly over the picket lines with a cargo of parts.

"Larry was against the strike, but amazingly enough he was very objective," recalled Bart Kelley. "He said you had to have a union in order to deal with another side."

In early 1950, Bell Aircraft's future looked promising, but nothing like the boom years of World War II. Employment stood at about 5,000 and the company's work emphasis had shifted from fixed wing aircraft to guided missiles, jet nacelles for bombers and helicopter production. Bell also developed and built the 12,000 pound Tarzon Bomb for the U.S. Air Force. It was the nation's first radio-guided bomb. Experiments on the X-1 series continued.

Commercial helicopter sales at that time had dipped to a low. Military interest was lagging, too, and those 500 Franklin engines Larry had ordered for a big surge from helicopter customers were gathering dust.

Then on June 25, 1950, the Republic of Korea was invaded by North Korea troops. This event, as tragic as it was, was the beginning of a success story for the helicopter.

"Orders from the Army began to pour in and Bell was able to fill them in record time," Kelley said. "Not only did we have readily available engines, but there were quite a few Model 47's on hand. Larry said buying those engines was the best mistake he ever made."

The demand for the helicopters to serve as rescue vehicles for the Army and Marines and to support Mobile Army Surgical Hospitals (MASH) units, created the biggest surge of production ever experienced by the new industry.

An example of Larry's unselfishness was brought to light when Hiller Helicopters received Army contracts to provide helicopters for the Korean conflict.

"Although Bell Aircraft had a corner on engines, Larry requested that we turn some over to the competition so the orders could be met." Kelley related.

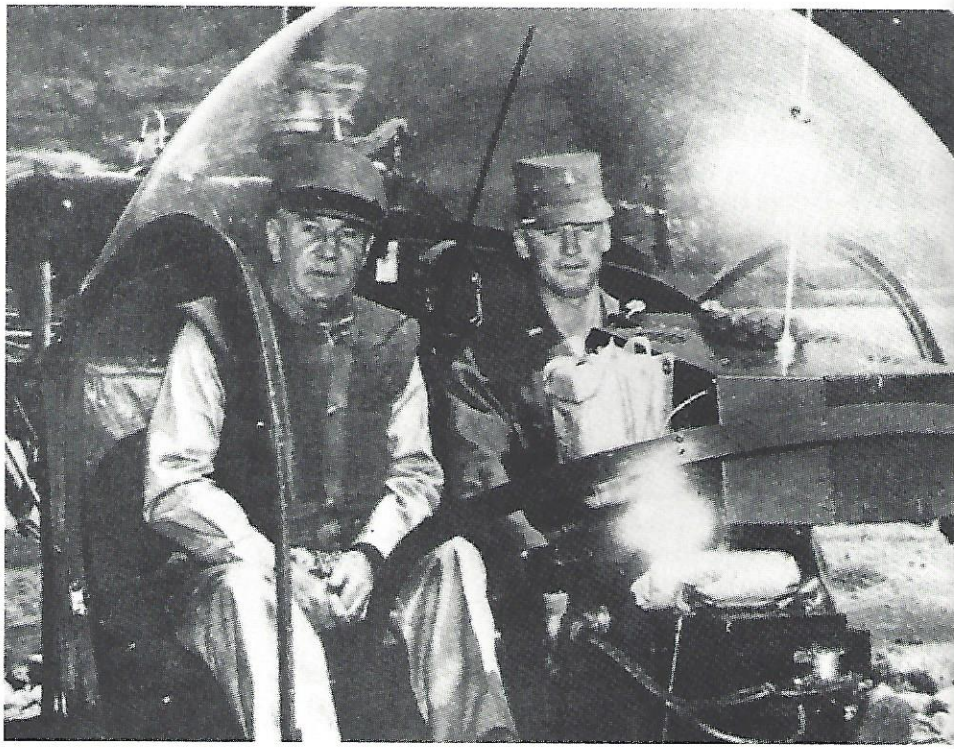
The helicopter's ability to operate in combat quickly dispelled any notions tha it was just a novelty or passing fad.

Army helicopters in Korea were unde direct control of the Surgeon General an were used almost exclusively for evacua tion missions. Many served with MASH units that were often located just outside enemy artillery range.

The 'copters were tremendous morale boosters to front-line troops. They knew that, if injured, they seldom were more than 30 minutes away from medical atten tion, thanks to these ever-ready machines

Other missions assigned to the helicop ters included aerial resupply, personne and cargo transportation, reconnaissance ship-to-shore services and radio message relay.

The Marines also used the helicopters for artillery spotting, while the Air Force found them most effective in air-sea rescue work. Downed airplane crews in World War II often took months to "walk out" of enemy territory. Helicopters in Korea usually rescued them in a matter of hours, sometimes minutes.



Larry returns from a MASH mission during his 1953 tour of the front lines of Korea.

Bell helicopters were tremendous morale boosters to front-line troops. If injured, they knew the ever-ready machines would speed them to a MASH unit.

Larry kindled a deep and humble pride that the helicopter built by his company was involved in saving lives, so in the summer of 1953 he arrived at the combat zone to take a first hand look. He was the only U.S. aircraft president to tour the front lines of Korea and he even accompanied pilots on MASH missions where the aircraft was subjected to artillery fire.

After completing his tour, Bell observed: "One of the worthwhile achievements to come out of the Korean War was the advancement of the helicopter. The operation of helicopters on observation, supply, rescue and evacuation missions has accelerated the entire helicopter industry by 20 to 30 years in terms of service experience."

Helicopters were in the thick of battle from the beginning to the end of the Korean conflict. They rescued an estimated 25,000 wounded United Nations soldiers and Korean civilians. In many cases the casualties were so critically injured that they would not have survived if evacuation by any other method had been attempted.

Eighty per cent of all front-line evacuations in Korea were credited to flights made by Bell-built H13 and HTL variants of the Model 47.

The outstanding performance by helicopters in Korea gave the rotary wing industry a well needed boost. Following their discharge, many pilots who realized a great potential in the machines from flying MASH missions, opened commercial charter operations. Military planners were also calling for new, improved models.

Shortly after the war, for instance, the Army saw the need for a larger Medivac helicopter, based on the success of the military type Model 47 which had room for only two litter patients who were attached to each skid. The requirement for more litter space led to an industry competition and Bell's development of the XH-40 which resulted in the famous UH-1 "Huey" series.

Another milestone of the early 50s was Larry's decision to separate the helicopter activities from Buffalo to another location. This contemplated move was prompted by the company's winning of a competition which called for manufacturing a number of Navy anti-submarine helicopters (XHSL-1) and Bell's desire to give his rotary wing divison more elbow room to develop and manufacture a variety of models.

"In the summer of 1950, Larry began to visit various cities, looking for a suitable site for a facility," Kelley said.

"Two of the candidates were Santa Barbara, California and Westfield, Massachusetts. I pulled for the latter, because it was a good market for machinists. But it didn't appeal to Larry at all. Then he came to Fort Worth. When Larry met the persuasive Amon Carter, he was sold."

Once the locality was established, Bell wasted no time in paving the way for the transfer of helicopter manufacturing from New York to Texas.

On Jan. 30, 1951, the 55-acre site was selected; ground breaking ceremonies were held for the proposed $7 million plant on May 21 and personnel began occupying the facility on Dec. 3.

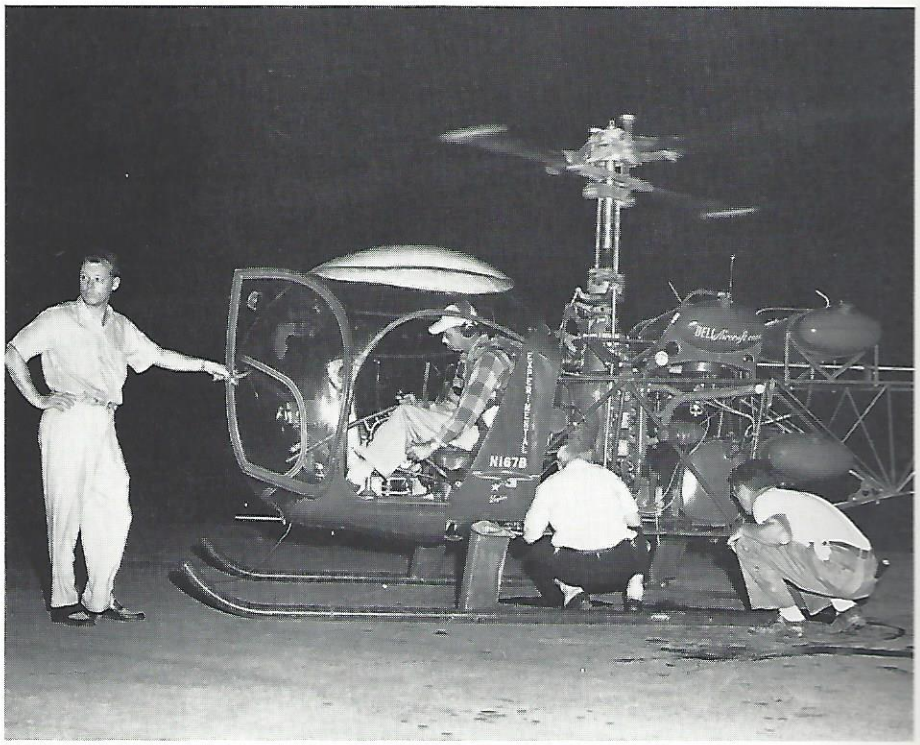
While the main plant was undergoing construction, helicopter production kept abreast of military and commercial orders at the old Globe Aircraft Plant in Saginaw which was leased by Bell in early 1951.

The Texas move was the beginning of a new era of helicopters that were destined to make a big impact on the world of aviation.

On May 21, 1951, Harvey Gaylord, vice president in charge of the new Fort Worth Helicopter Division, turns the first spade of earth at the site of the plant. At left is the late Amon Carter, Star Telegram publisher.

Bell's new helicopter plant begins to take shape with the completed administration building, foreground, and the manufacturing facility getting some final touches. The plant size has quadrupled since.

A daydream triggers a 1,217-mile flight



On Sept. 17, 1952 at 4:41 a.m. Elton Smith prepares to take off from Fort Worth on his non-stop flight to Niagara Falls.

Whenever there was an opportunity to put the helicopter in the limelight, Larry jumped at the chance.

In 1949, a Bell helicopter attracted attention by setting an altitude record of 18,550 feet; another machine established a speed record of 133.9 miles per hour. In 1950, a Bell Model 47D-1 became the first helicopter to fly over the Alps.

But perhaps one of the most effective ideas to prove the safety and reliability of the aircraft came from a young experimental test pilot named Elton Smith.

Shortly after the Bell Helicopter Division had moved into its new Fort Worth home, Smith was taking a Model 47 through overload gross weight tests for the U.S. Army.

"When I was flying back from the tests, I began to daydream," he said. "I thought what if I replaced these sandbags with extra gasoline? The fuel would be enough to fly from here to the Niagara Falls plant non-stop."

When Smith landed he told Bart Kelley and Floyd Carlson about his plan.

"Bart hinted that I'd been out in the sun too long," Smith noted, "but after making some calculations, he decided it wasn't a bad idea and put in a call to Larry.

"Larry thought the proposed flight would be terrific, that it was a good way to get positive publicity. Remember, the helicopter was still a relatively new mode of transportation and needed all the proof of dependability it could get."

On September 17, 1952 at 4:41 a.m., Smith took off in a Model 47D-1 loaded with 187 gallons of gas and two quarts of oil. Twelve hours and some 57 minutes later he landed on the front lawn of Bell's main plant in Niagara Falls, N.Y. His non-stop flight had covered 1,217 miles.

Smith's flight went in the books as setting the world's record for helicopter distance flight in a straight line without payload. The feat gained national and international press attention.

"Larry was the first to greet me after the landing," Smith recalled. "The first thing he did was to hand me a note. "It read: 'Do you feel well? Can you walk'?

"I nodded yes to the first question, but no to the second, because both legs were asleep. Larry, I think believed I might collapse if I left the helicopter right away. There were TV crews around and a fall would have been a little embarrassing. He was a very compassionate man."

In financing the flight, money apparently was no object. According to Smith, a total of $76 was spent for special equipment in a surplus store including a fuel selector valve, a wobble pump, hoses and fittings. To find Niagara Falls, he relied on maps and an inexpensive alcohol compass, and of course, something that looked like a big waterfall.

"You can imagine what a flight like that would cost today," Smith observed.

At the Helicopter Division's first management dinner in October 1952, Larry Bell presented an inscribed watch to Smith and remarked: "More important than the thrill of setting a world's record is the benefit it produces for the industry. Now the average husband is more likely to take his wife for a six-minute helicopter flight without fear since Smith flew non-stop for more than 12 hours."

At the end of 1952, the Texas plant had manufactured more rotary-wing aircraft than any other company. During that banner year, 416 helicopters rolled off the assembly line. In December alone, 67 aircraft were delivered. Employment was growing, too, up from 259 to 2,600 in 12 short months.

Elton is greeted by Larry following the pilot's 1,217-mile record breaking flight.

Blazing New Trails

During those first years in Texas, Bell's new helicopter home on the range, chalked up a multitude of milestones, including:

- The first flight of the HSL anti-submarine helicopter (Mar. 3, 1953).
- Production attainment of the 1,000th Model 47 (April 10, 1953).
- First delivery of the HSL-1 to the Navy (Jan. 26, 1954).
- First flight of the XH-13F turbine helicopter (Oct. 20, 1954).
- XV-3 convertiplane rollout (Feb. 10, 1955).
- Winning of an industry competition for the Army's first production line turbine-powered utility helicopter (Bell 204 / Army UH-1) (Feb. 23, 1955).
- First flight of the XV-3 covertiplane (Aug. 11, 1955).

The convertiplane was one of Larry's favorite projects. He had realized as far back as 1943 that a union was inevitable between the vertical takeoff and landing abilities of the helicopter and the speed and cruise characteristics of the airplane.

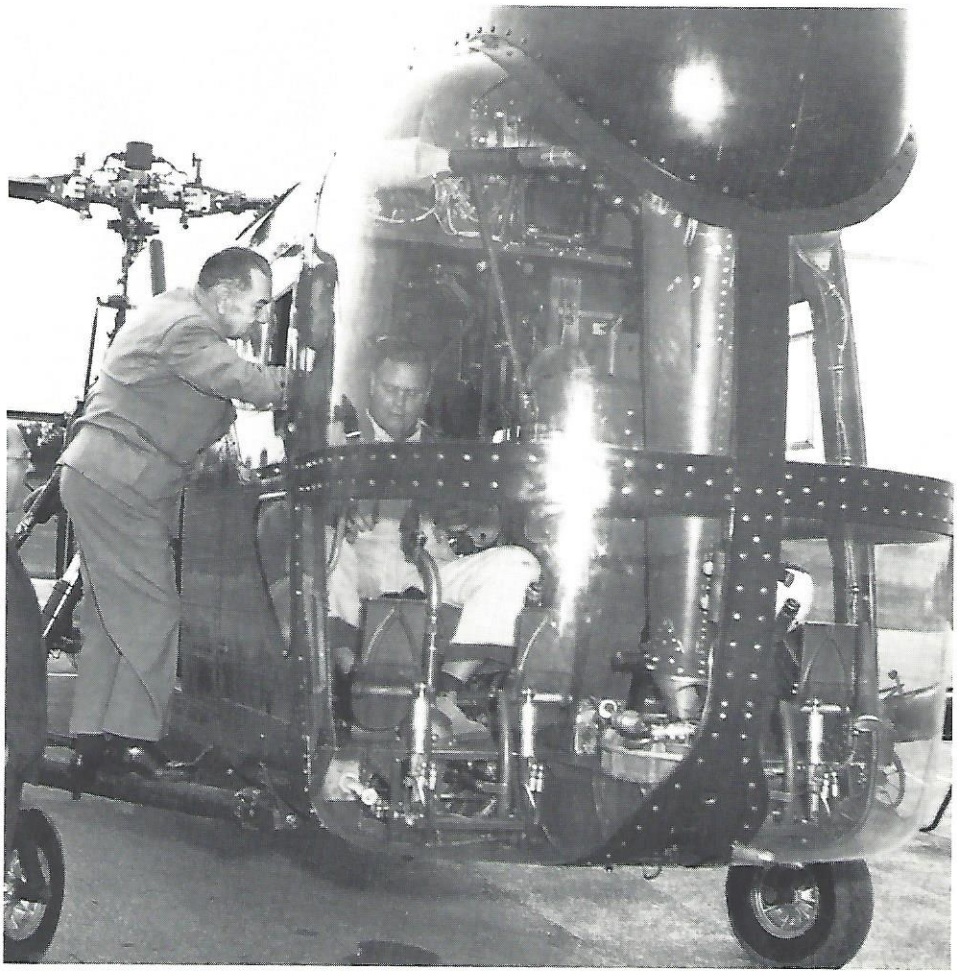
One of the pioneers of this concept was the late Robert L. Lichten, who joined Bell's helicopter division in 1948 to begin preliminary work on the tilting type aircraft.

Thanks largely to the efforts of Lichten Bell was one of three companies awarded Phase I contracts in a joint Army-Air Force contract for the development of a practica convertiplane for the Army.

Following the successful completion o Phase I, a Phase II letter was awarded in January 1953 for the XH-33 (later redesignated XV-3) which covered further development, prototype construction and testing.

The XV-3 opened up a unique area of operation for military and commercial flying and eventually led to the Model XV-15 which today, is blazing new trails in aviation.

In November 1953, hundreds of Bell employes witnessed a Floyd Carlson flight demonstration of the XHSL, the Navy's tandem-rotor helicopter. Larry was first on the scene when Carlson landed the aircraft.



On Apr. 10, 1953, the 1000th Model 47 rolled off the assembly line. Five of the original Gardenville employes on hand for the milestone were; from left, Joe Mashman, Floyd Carlson, the late Percy Waller, Bart Kelley and the late Jack Buyers.

"The convertiplane will open avenues of aerial transportation that no one dares to dream of now," Bell predicted. "Its advent will mean that air transportation will become available to practically every city in the world, including those whose size makes it impossible for them to support an airport."

With programs like the XV-3 taking hold and the rising growth of Bell Aircraft's other diversified businesses, Larry's schedule was back breaking.

"I don't know where he got all his stamina," Floyd Carlson said. "It seemed like he worked 24 hours a day, seven days a week."

Few knew it, but Larry had a case history of hypertensive cardiovascular disease. During his 1953 tour of Korea he suffered chest pains, but it passed and he charged right on.

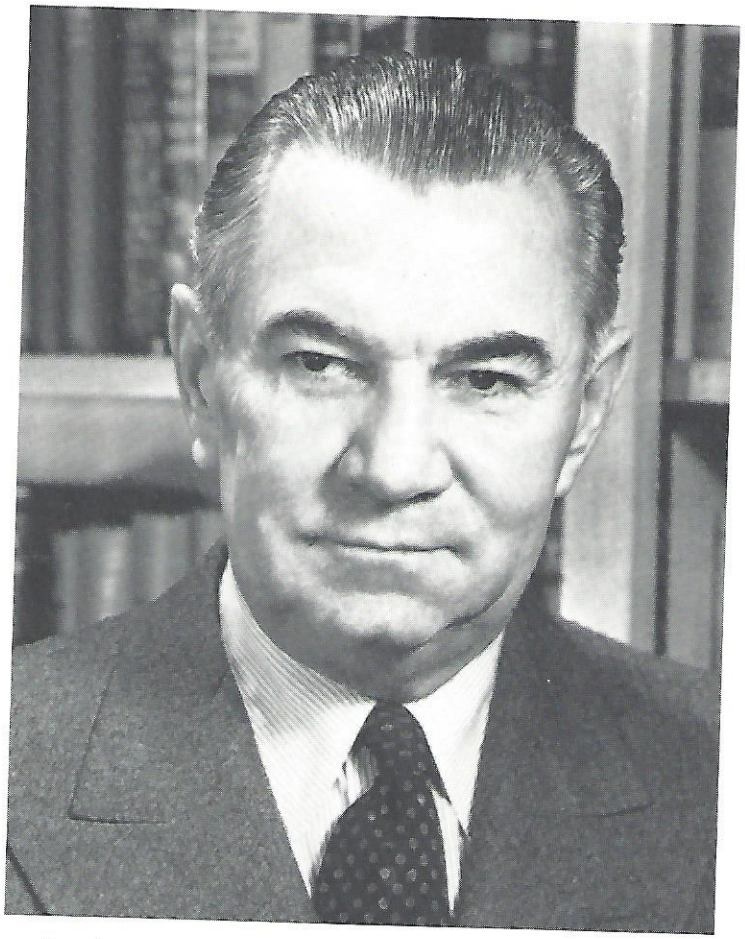
Then in late 1954, he experienced another attack. On the advice of his doctor, Larry attempted to reduce his workload.

Although he named Leston P. Faneuf to succeed him as general manager of the company, Larry retained the position of president and took things easy for a while. It was only a temporary rest. There were too many irons in the fire.

When he wasn't devoting his energies to Bell Aircraft and five subsidiaries that were involved in everything from guided missiles to making jet engine nacelles for Boeing bombers, Larry made periodic visits to Texas to check on helicopter developments.

Although involved in countless projects, Larry always took the time to stop and say hello to employes at the Fort Worth plant. Many a time he'd walk down the shop line and greet workers by name.

"He had an uncanny memory for



Larry's strong character is evident in this formal photo, one of the last taken before his death.

Larry always had a sincere regard for his employes. During the unveiling of the XV-3 at special ceremonies on Feb. 11, 1955, Larry was host to military visitors on a tour of the plant. C.F. Little, left, recalls that day. "Mr. Bell excused himself from a group of generals and colonels to come over and say hello," Little said.

names," Carlson said, "and he was genuinely sincere in his friendliness and concern for the well being of his people. On one occasion he asked if I'd drive him around to see where some of the fellows lived. He spent most of that day talking to wives and kids. Everybody loved Larry."

Larry had worked hard all of his life and he couldn't slow down despite the odds. His fatiguing pace finally was broken in May 1956 by a stroke and his health rapidly deteriorated. On Sept. 18, 1956, he asked to be relieved of the presidency of the company he had built and led for 21 years. He became chairman of the board, but his tenure would be a short one.

On Saturday afternoon, Oct. 20, 1956, Carlson climbed in the XH-40 and took it

The first flight of the XV-3 was made on Aug. 11, 1955 by then Chief Pilot Floyd Carlson. Larry predicted a successful future for the convertiplane concept.

up for the first hover flight. Bart Kelley was among the spectators on the Bell heliport.

"At precisely the moment Floyd landed, we were notified that Larry had died," Kelley said. "It was, I felt, a fitting tribute to a man who had done so much to pioneer the helicopter."

In his 62 years, Larry Bell had left a mark equalled by few men in aviation or any other field of effort, for that matter. He was at his death the dean of senior aviation executives in the country. He had more than proved to be an aviation trailblazer, a pioneer with the courage and the ability to penetrate new frontiers and to leave aviation a list of technological feats probably not yet achieved anywhere else by any one man.

Following services at the Delaware Avenue Baptist Church, Lawrence Dale Bell was laid to rest at Buffalo's Forest Lawn Cemetery. More than 1,500 mourners paid tribute to him, including civic leaders, officers from branches of all the Armed Forces, industry colleagues and co-workers.

During the funeral services, the pastor made this observation to the overflowing congregation:

"Lawrence Bell believed the greatest horizons are beyond the physical life an now he has entered that frontier."

"Show me a man who cannot bother to do little things and I'll show you a man who cannot be trusted to do big things."

Lawrence Bell

After the Model XH-40 completed its first hover flight on Oct. 20, 1956, word was received that Larry Bell had died.