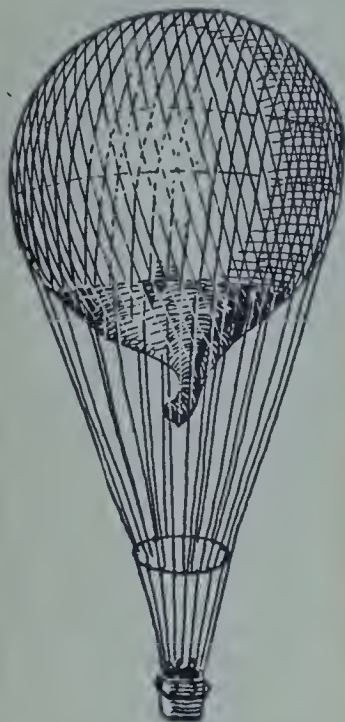
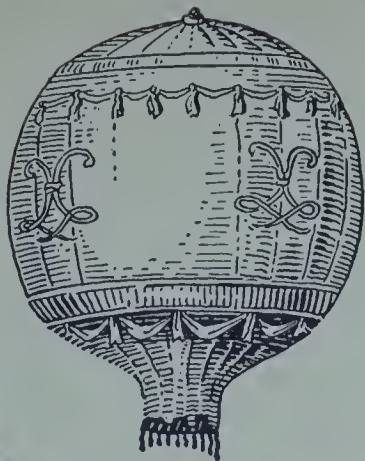


# AIR TRAVELERS



LAURA A. LARGE





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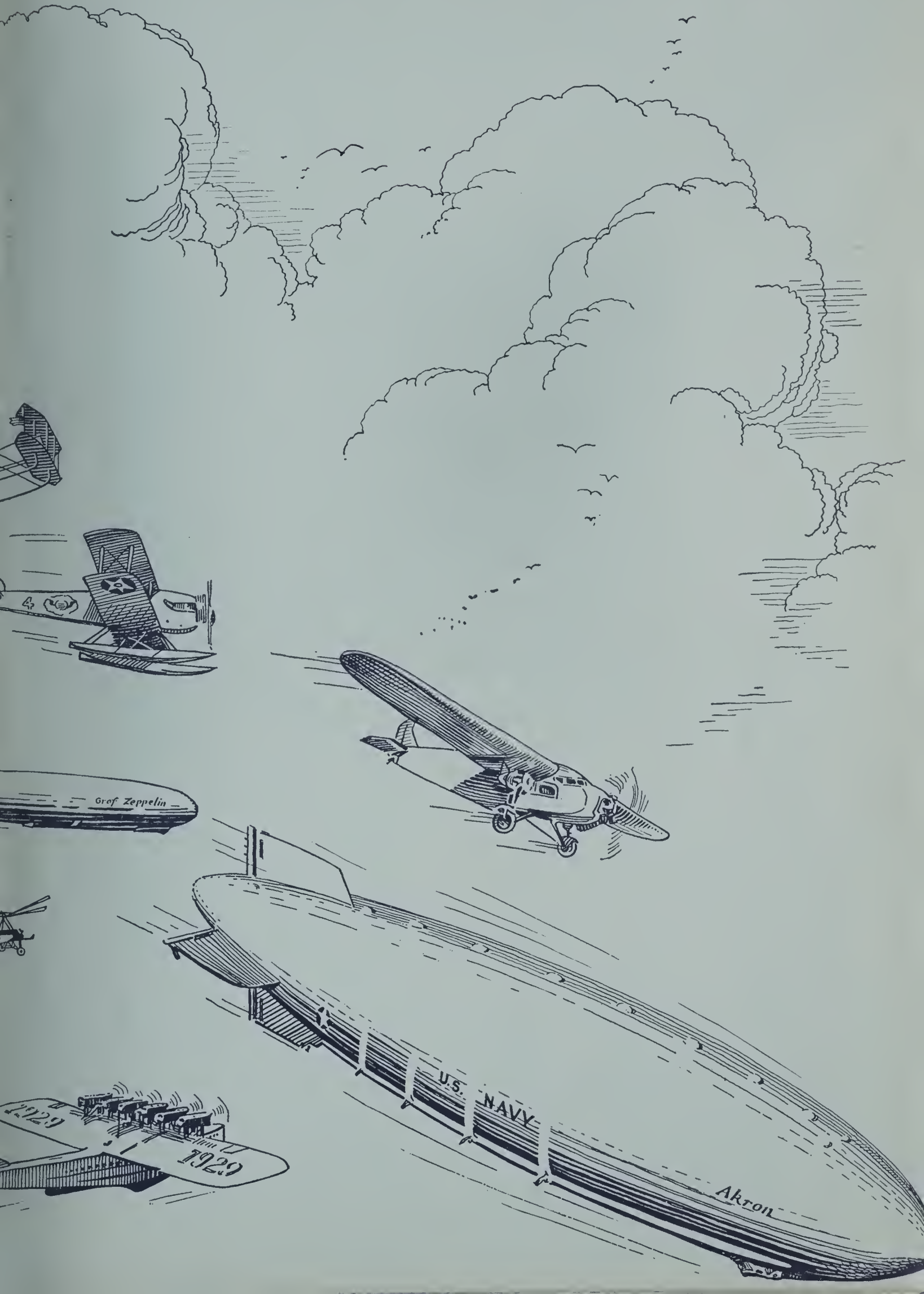
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# Journeys Onward







AIR TRAVELERS

*From Early Beginnings to Recent  
Achievements*









SANTOS-DUMONT'S MOTOR-DRIVEN PLANE.



# AIR TRAVELERS

*From Early Beginnings  
to Recent Achievements*

BY  
*Mrs. LAURA A. LARGE*  
*ritoinette (S.)*

ILLUSTRATED BY  
HAROLD CUE  
AND FROM PHOTOGRAPHS



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AIR TRAVELERS

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# AIR TRAVELERS

## *MAKE-BELIEVE FLYERS*

LONG ago, men liked to make up stories about flying. They told of winged horses, magic carpets, and gods with wings on their feet.

One story was about Daedalus and his son Icarus, who were prisoners in Crete. Daedalus made a pair of wings for himself and a pair for his son.

“With these wings, we may be able to make our escape,” the father said to the son. Then, as he attended to the last fastenings, the father gave a word of advice. “Keep away from the sun,” he cautioned.

Not long after, the two climbed to the top of the prison wall, and to their great joy found that the wings worked perfectly. Up they went

and over the sea, as free as birds, and even happier.

Daedalus crossed the body of water and made his escape. Icarus enjoyed flying upward so much that he forgot what his father had said, and drew too near the sun, the great heat of which melted the wax that fastened his wings.

Down fell Icarus into the sea, and that was the end of one of the flying gods.

## *THE WOODEN PIGEON*

FOUR hundred years before Christ, lived Archytas, a learned man of Taranto—a scholar of geometry.

Archytas made a wooden pigeon that could fly by machinery.

The bird had one great weakness. If it fell, it could not lift itself up again.

Archytas tried to make it behave more like a real bird, but could not.

Then he went back to his geometry studies.



## *A SHIP OF THE AIR*

“WATER will hold up a vessel. Why should not air do the same with a special kind of ship? Make the ship of a large hollow globe of copper or other metal wrought very thin to make it as light as possible. Fill it with ethereal air or liquid fire, then launch it from some high point. Like a ship on the water, the vessel should float on the air.”

Roger Bacon, born in 1214, said this.

His idea was a good one, but he did not try to carry it out.

## *WINGS LIKE BIRDS*

LEONARDO DA VINCI, born in 1452, filled notebooks with pictures and designs of his ideas about flying.

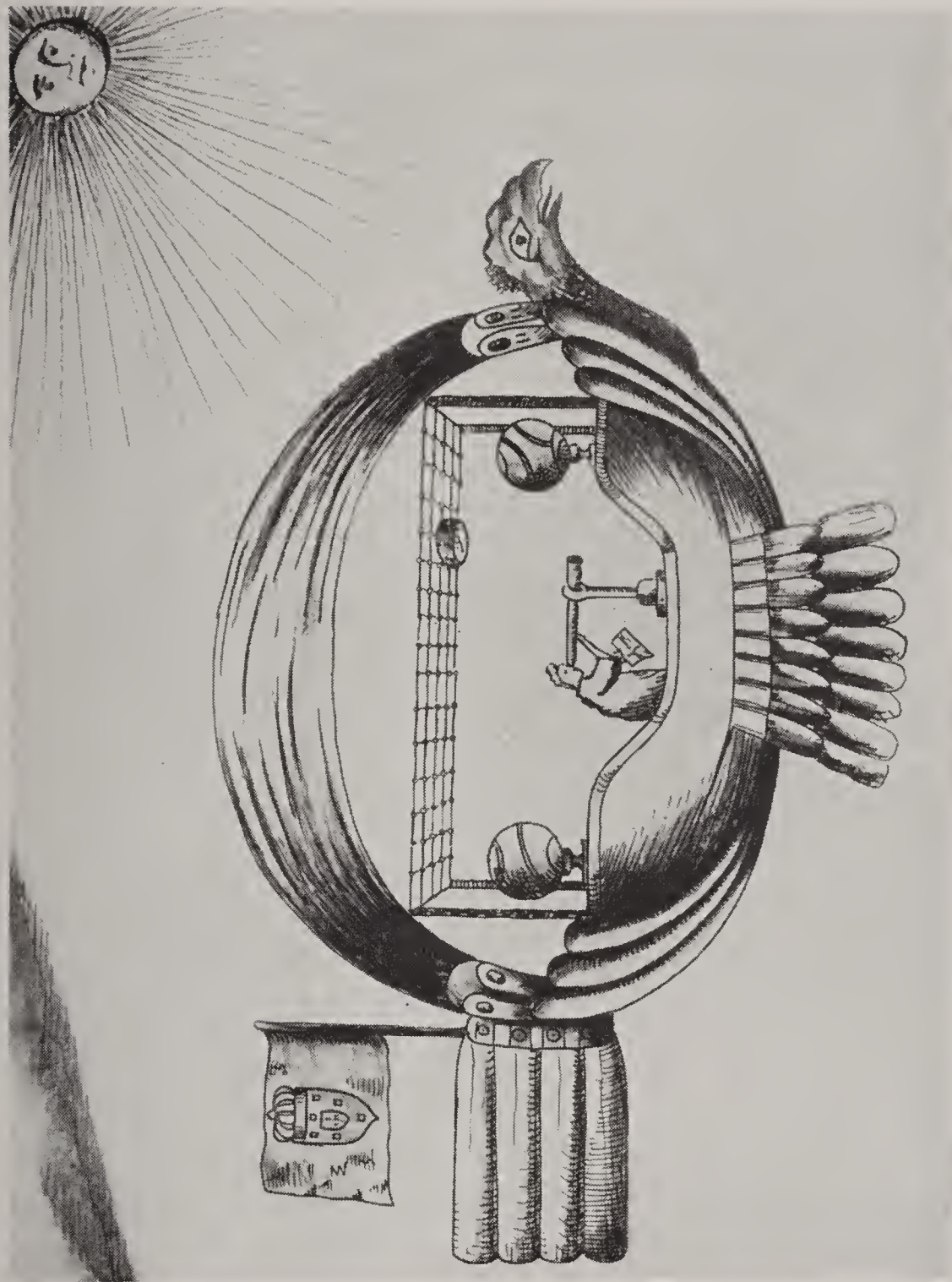
“Why not make flapping wings to be used as a bird uses his wings?” Leonardo da Vinci asked.

He made sketches to show how this could be done. With the legs, the wings were to be thrust downward. With the arms, the wings could be raised.

It looked easy enough in the picture, but did not work well. As compared with his weight, a man’s muscles are not so strong as those of a bird.

Leonardo da Vinci invented the aërial screw which is used to-day. With paper propellers, he was able to fly small models.

He made sketches for a machine ninety-six feet in diameter. But this machine could not be raised from the ground without some kind of a motor, and at that early time there were no motors for use in flying.



*Photograph by Keystone.*

A MODEL AEROPLANE OF 1709.

The designer expected the sun to have sufficient attraction for the precious stones in the overhead grid to raise the ship.





## *A FLYING CHARIOT*

“MAKE four hollow copper spheres, very light and thin. Attach them to the four corners of a car and add a sail. Remove the air from the spheres, to make them rise, and the car will go up with them. It will be a flying chariot.”

In 1670, Francesco Lana said this. Had he tried to carry out the idea, he would have failed, for the copper spheres would have been too thin to stand the pressure of the air about them.

## *THE FIRST FLYER*

A FRENCH locksmith named Besnier, in 1678, made two wooden bars to rest upon his shoulders. Muslin wings were fastened to the ends of these bars. The bars were pulled up and down by his arms and legs, while the wings opened flat on the down stroke and folded vertically on the up stroke.

Besnier's plan was to jump from different heights and let his wings carry him as far as possible.

A window-sill was his first starting-place. A second-story window was the next. When brave enough, he jumped from a garret. Over the roof of a small cottage not far away he soared, and landed safely.

Besnier, in this way, became the first successful flyer—his apparatus a crude glider.

Besnier did not carry his work farther. He sold his bars and wings to a travelling showman, and withdrew from the world of flying.



## *HOT-AIR BALLOONS*

Two brothers, Joseph and Stephen Montgolfier, sat before the fire of their home near Lyons, in France. They were watching the smoke make its escape upward through the chimney.

“Do you suppose it could ever be made to carry something along?” Joseph asked.

“The idea sounds reasonable,” Stephen made answer.

The brothers kept thinking about it. They decided to catch smoke in a bag and see what would happen.

The father of the two Montgolfiers had been a paper manufacturer, and had left the business to his sons. The brothers took one of their small paper bags and held it over the fire, where it would fill with smoke and hot air.



*Photograph by Keystone.*

THE MONTGOLFIER'S SUCCESSFUL BALLOON.





The boys fastened the top of the bag, let go of it, and up to the ceiling it went!

Joseph and Stephen took other bags for out-of-door tests. Always when filled with smoke, the bags rose up into the air.

The boys repeated their tests many times. They kept on making larger balloons, too. At last they had one that was one hundred and ten feet in circumference.

They invited the public to see what they had learned.

The huge linen bag was lined with paper and decorated with designs. In a hole in the ground, a fire of wool and straw was made. The bag was held tightly over the fire until filled with smoke and gases. When released, it shot upward, like a soft bullet!

Six thousand feet, or more than a mile, the balloon rose, and travelled a mile and a half before coming down to earth.

This was in June, 1783, and little was known

about what really made the fire-balloon ascend. Like the Montgolfier brothers, every one thought that the smoke and gases which came from the fire had carried the balloon upward. Now we know that the balloon went up because it was filled with air that was hotter than the cold air around it, and therefore lighter.

No matter what the Montgolfier brothers thought to be the reason for their success, they had been able to make the first balloon, called a "Montgolfier," at that time.



## *A HYDROGEN BALLOON*

SINCE hydrogen was known to be a very light gas, a scientist named Charles decided to use it in a balloon. He got two brothers, whose last name was Robert, to help him.

The Robert brothers found that the new gas would slip through a paper-and-linen bag such as the Montgolfier brothers had used. Instead, they made a bag of silken material known as lutestring, which was varnished with dissolved rubber.

Next came the making of the hydrogen and the filling of the bag. This last proved to be the hardest part of all. The hydrogen could get through the tiniest sort of an opening, and seemed bent on making its escape.

Four days the men worked to get their balloon filled.

At last the work was completed, and a demonstration was planned, just two months after the Montgolfier brothers had exhibited their hot-air balloon.

The hydrogen balloon was carried in a procession from the Place des Victoires, where it had been filled, to the Champ de Mars, where it was to ascend. Before daybreak, with torches to light the way, the balloon was carried in a cart, with a heavy guard at the front and rear.

Nowadays, if such a large amount of inflammable hydrogen were being carried so near an open flame, every one would run away. At that early time, people did not realize how great the danger was.

Instead of running, a crowd joined the procession. Fortunately, the flame did not ignite the hydrogen.

On the Field of Mars, more than one hundred thousand people gathered on that afternoon, although there was a pouring rain.

## A HYDROGEN BALLOON 25

At five o'clock a cannon was fired, and the balloon rose.

In just two minutes it had disappeared into a dark cloud more than three thousand feet above the heads of the excited throng.

Once more it appeared, then was lost to view.

## A DANGEROUS MONSTER

FIFTEEN miles from its starting-place, the first hydrogen balloon began to descend.

“Look!” Some peasants working in a field pointed to the large balloon about to alight near by.

The peasants did not know what balloons were, and they were frightened. When some of the gas with which the balloon was filled began to escape through a tiny hole, they were more frightened than ever. The noise sounded like that of an animal breathing heavily.

“What is this?” the peasants cried. “Is it a dangerous monster come to destroy us? *Away with it!*”

The peasants seized their pitchforks and other tools within reach. They dashed at the balloon! They pierced holes in it and tore the

## A DANGEROUS MONSTER 27

fabric into shreds! Then they tied the wrecked balloon to the tail of a horse, and it was dragged here and there until nothing was left but scattered pieces!

## *BARNYARD PASSENGERS*

THE King of France ordered the Montgolfier brothers to send a balloon up into the air for him.

The Montgolfiers made a larger bag than they had used before. They hung a wicker basket below.

“Who wants to ride in the basket?” the brothers asked.

“Not I!” was the answer from all quarters. One balloon had just burst in mid-air. Another had descended in a strange field and had been attacked by farmers with pitchforks. Besides, no one had ever taken a ride in a balloon.

“We shall let a few barnyard friends make the trip,” the Montgolfiers said.

A duck, a sheep, and a rooster were fastened



to the strong wicker basket. The balloon, with the basket, was sent up into the air.

“The animals will be killed!” some said.

“They may be having a pleasant ride,” others suggested.

It did not take long to find out. Two miles the balloon travelled, then landed gently.

The barnyard friends had not been killed. They were as safe as could be and, for all any one knew, had enjoyed the ride.

All but the rooster. He had been kicked by one of the other passengers.

## *THE FIRST MAN TAKES A RIDE*

“I AM not afraid to take a ride,” a Frenchman, named Jean François Pilatre de Rozier, announced, a short time after the barnyard passengers had returned in safety.

“Very well, if the King is willing, you may be the first one to try out balloon-riding,” was the answer.

The King was opposed to the idea of allowing any one of his subjects to risk his life in this way.

“If any one is to take the chance, let it be a criminal,” the King said. “If he comes back with his life, he can be pardoned.”

“It would be a great honor to be the first man passenger. I should like very much to try,” Monsieur de Rozier argued.

At last the King gave his consent.

## THE FIRST MAN TAKES A RIDE 31

The balloon chosen was a fire-balloon of the kind which the Montgolfier brothers had made.

At first, Monsieur de Rozier went up in a captive balloon, held to the earth by ropes so that it could not go up too high nor travel away from the starting-place.

Later, with the Marquis d'Arlandes for a companion, Monsieur de Rozier ascended in a free balloon.

The balloon was a large one, seventy-four feet high and forty-eight feet in diameter. A wickerwork gallery three feet wide surrounded the bottom opening, which was fifteen feet across. A brazier was hung from the balloon by iron chains. On this brazier the flyers had to put fuel when they wanted the balloon to rise.

The two men stood on the balcony and waved their handkerchiefs as the balloon rose.

“Will the brave men reach the ground again in safety?” That is what every one wanted to know.

The balloon kept on rising and floating away from its starting-place. At one time it began to descend into the Seine River. Monsieur de Rozier and his companion added straw to the fire under the balloon opening. The hot air made by the burning of the straw made the balloon rise. Higher up, a strong current of air carried the flyers over the water in safety.

The balloon caught fire in one place.

But, with all the danger, the men were unharmed, and after rising to a height of five hundred feet and travelling a distance of one and three-quarters miles, the balloon descended.

The flight was made on November 21, 1783. A new kind of passenger-service was begun on that day.

## *THE HYDROGEN BALLOON TAKES PASSENGERS*

A SHORT time after the de Rozier passenger flight, one of the Robert brothers ascended in a hydrogen balloon with the scientist named Charles.

Instead of a mile and three-quarters, these men were able to travel twenty-seven miles. Instead of rising five hundred feet, they reached a height of almost two thousand.

They descended just as the sun was setting. Robert left the balloon, but Charles remained behind and went up again.

It was a quick ascent, this time—up as high as two miles, where it was cold, although the air was warm down on the earth. A second sunset came into view, too, along the way.

The balloon remained aloft only fifteen min-



utes and descended again three miles from the place where Robert had left it after the first flight.

This test, and others which followed, showed that the hydrogen type of balloon was more efficient than the fire-balloon which the Montgolfiers had been using.

Charles did other work that is seen in balloons of to-day. He invented the valve at the top of the bag, through which the gas can be allowed to escape should the flyer wish to lower the balloon.

Hanging the car from a metal ring about the bag was his idea, also.





*Photograph by Keystone.*

A PASSENGER BALLOON IN 1793.



## *TRYING FOR DISTANCE*

A FRENCHMAN named Blanchard wanted to be the first to cross the English Channel by air.

A Dr. Jeffries, of Boston, heard of the plans.

“I should like to go, too,” he told the Frenchman.

“I should rather try it alone,” was the answer.

“If you will let me go, I will help pay for the trip,” the American promised.

“It will cost hundreds of dollars.”

“I should like to go, anyway.”

“Very well.”

The two left Dover, England, on January 7, 1785. All went well for about an hour. The weather was fine and the wind steady. As they sailed away from the English coast, in their

slowly revolving car, they were able first to see France on one side, then England on the other.

When about a third of the way across, the ship began to descend rapidly. It seemed that the balloon was doing its best to get *into* the water instead of *over* it.

The men had to throw overboard three sacks of ballast, pamphlets, biscuits, apples, oars, the rudder, all the ornaments on the inside and outside of the car. Then, bit by bit, all their clothing was discarded.

The flyers put on their cork jackets.

“Ready for the waves,” this meant.

Then at last the balloon began to rise. It went so high that the travelers grew very cold, since their clothing had been thrown overboard.

Suddenly the balloon floated into a strong current of air which carried it as far as the coast of France and into the branches of a tall tree.

No matter what the landing happened to be,

the twenty miles of the English Channel had been crossed for the first time by air.

A monument now marks the landing-spot, in the forest of Guines, not far from Ardres.

## *THE FIRST MAN KILLED*

“I AM going to try to cross the English channel from France to England,” announced de Rozier, a short time after Blanchard and Jeffries had made their successful crossing in the opposite direction.

With great care, de Rozier went about the task of getting ready. He had decided to use a new kind of flying ship. A hydrogen balloon was to be made to float above a Montgolfier, or fire-balloon, which would hang about five feet below. It was to be a sort of double balloon.

The Montgolfier, de Rozier made of plain green silk, lined with paper. The gallery which encircled the Montgolfier was fifteen feet wide, made of small osier twigs tightly woven. Within the gallery was stored food, with char-



coal, straw, and wood for tending the fire of the lower balloon.

Much interest was shown in the voyage which was to be made in a new kind of craft.

“Let me go with you,” certain friends of de Rozier begged.

De Rozier had promised to take a man named Romaine, and had to refuse all the others. One disappointed man offered two hundred louis d’or to Romaine for the privilege of being allowed to take his place as a companion.

While making preparations, even though others wished to risk taking the trip, de Rozier seemed to feel that he would never reach England in safety.

“I would give twenty thousand pounds,” he said, “if I had never set out to perform such a dangerous task.”

“Then why not give up the voyage?” he was asked.

“Please don’t mention such a course,” the

reply came back. "I would rather meet death than give up anything which I have begun!"

"But," he went on to say, "if I do reach England in safety, I will never, never fly again."

By June all was ready, and early on the morning of the fifteenth, thousands of people gathered to see the departure.

At twelve minutes after seven a cannon was fired, and the double balloon rose straight into the air.

Shortly after, it could be seen travelling westward, evidently carried by a current of air blowing in that direction.

The spectators watched eagerly.

At the end of half an hour the occupants of the car were seen to be doing something with the fire-basket. A cloud of smoke arose and a blue flame seemed to wrap itself around the balloon. The fire from the lower Montgolfier had ignited the explosive hydrogen gas of the upper balloon!

## THE FIRST MAN KILLED 41

Needless to say, the unfortunate flyers did not survive this accident. The man who had been the first balloon passenger was also the first to lose his life in a flying disaster.

## *A BALLOON THAT COULD BE STEERED*

AFTER de Rozier's accident, almost nothing was done with balloons for the next ten years. Then, little by little, men began to take up the work again.

Henry Giffard, a brilliant engineer, wanted to make a balloon that could be steered.

He made a small, light-weight steam-engine. With this to furnish the needed power, on September 24, 1852, Giffard rose from the Hippodrome in Paris.

A fire to keep the steam-engine running burned brightly beneath the large balloon filled with the inflammable hydrogen. Like many others of his time, Giffard did not realize how great this danger was.

Fortunately, nothing came of it on that trip.





THE FIRST DIRIGIBLE.





## A DIRIGIBLE BALLOON 43

The balloon rose awkwardly and ploughed through the air. It is true that the speed was only six miles an hour, but Giffard was able to direct the course of the flying ship, and that was his greatest wish.

He had succeeded in making the first dirigible balloon.

## ZEPPELINS

COUNT ZEPPELIN was a German soldier who had studied military ballooning. When he retired from the army he wanted, more than anything else, to make an airship that could be of use in time of war.

He found that the kind of dirigible balloon used by Santos-Dumont had many disadvantages. If her bag should be punctured in any part, it would lose its gas, which was stored in one container. When out of shape because of air pressure, the Santos-Dumont dirigible balloon had been found hard to propel.

Count Zeppelin designed a dirigible balloon that could not change in shape on the outside. It consisted of a stiff framework of aluminum alloy which was both strong and light. Within the framework was a bag containing many gas

compartments and covered with a tightly stretched fabric. *LZ-1* (Luftschiff Zeppelin-I) the rigid dirigible balloon was called. The *LZ-1* was thirty-eight feet in the greatest diameter and four hundred and twenty feet long—the largest craft that had ever been built.

For it Count Zeppelin made a floating hangar, which he launched on Lake Constance, in Switzerland.

Friedrichshafen, on Lake Constance, was the scene of the first trial flight, in July, 1900. The Zeppelin could travel only eight and a half miles an hour, at first, but later attained a speed of seventeen miles an hour—by far the greatest speed yet reached by an airship. Count Zeppelin became a popular hero and had no trouble in getting money from the public for the building of other dirigible balloons.

The *LZ-2* was built with a part of the money so raised. The motors of this craft gave eighty-five horsepower instead of sixteen, and showed

that the internal-combustion engine was a practical one to use.

The *LZ-2* did not last long. In one accident she was damaged by wind, in another, destroyed by it. The Count nearly withdrew from aëronautics, so great was his disappointment.

But he persevered. He built another dirigible balloon within nine months after the *LZ-2* disaster.

The *LZ-3* proved to be very successful.

The *LZ-4* was an improvement on any of the Zeppelins that had been built before. It had two motors of one hundred and ten horsepower each, and could carry fuel to last sixty hours.

In 1908, on the 4th of July, the *LZ-4* travelled to Lucerne and Zurich, then back again to Lake Constance, a distance of two hundred and thirty-five miles, in twelve hours' time, at an average speed of thirty-two miles an hour.

The German Government offered to buy the *LZ-4* if she could be made to remain in the air



twenty-four hours and could land and rise again according to certain provisions. Working toward this end, the *LZ-4* was in flight one day, when she was forced to stop because of motor trouble and gas leakage. A sudden squall arose and in the violent storm she was torn loose from her mooring. Adrift, with motor trouble, her ascent could not be controlled. She rose quickly, and the hydrogen in her gas cells swelled in the thin air of the high altitude. An explosion in the cells, followed by a sudden burst of flame, left nothing of the whole structure except metal wreckage.

The flight of the *LZ-4* had been only three hours and fifteen minutes short of the government's requirement for acceptance. Destroyed when so near her goal, the sympathy of the whole country was with Count Zeppelin. Ten million marks, or two and a half million dollars, was raised for his work. The Emperor visited the hangar at Lake Constance to see the

*LZ-3*. He praised Count Zeppelin for what he had been able to do, and embraced him publicly. He decorated the Count with the Order of the Black Eagle, and allowed the Crown Prince to take a trip in the *LZ-3*. With four army officers to observe, Count Zeppelin travelled to Munich and back. This successful flight was made in March, 1909, from which time the *LZ-3* was known as the "S.M.S. Zeppelin-I"—the first of an aërial fleet.

In 1910 came the first Zeppelin to be run for pleasure. It had three motors, a comfortable cabin, and a restaurant. Under the name *Deutschland*, it carried many aërial passengers on a number of successful trips, at a speed of forty-five miles an hour.

In June, 1910, with twenty-three passengers, the *Deutschland* left Dusseldorf for a few hours' run. Things went well for a time. Then, one by one, the motors broke down because of a heavy gale that was blowing. The wind seized

the airship, and it crashed down into a forest. The Zeppelin was wrecked as it struck the great trees, but every one aboard was uninjured, and reached the ground by means of a rope-ladder.

As with the others, this mishap did not keep Count Zeppelin from going on with his construction work. In all, he had built twenty-six Zeppelins by 1914, some of which attained a speed of fifty miles an hour. Improvements were also made in steering arrangement, construction, and machinery.

In 1910 the German Air Travel Company was formed for the purpose of running passenger excursions. Over seventeen thousand passengers were carried on the four air-liners belonging to this company, and one hundred thousand miles were covered during the four years of the company's existence.

The Zeppelin had come to hold an important place in the science of flying.

## *A PRIZE-WINNER*

SOMETIME during the year 1901, a member of the French Flying Club announced that he would give a prize of one hundred thousand francs to the man who should have such good control of a dirigible balloon that he would be able to travel from the Flying Grounds at Aero Club Park, around the Eiffel Tower and back, within half an hour. It was a distance of seven miles.

A number of men had failed, when a young flyer from South America decided to try for the prize. He was Santos-Dumont, who lived in Paris and had taken up flying as a sport.

Santos-Dumont tried out a number of balloons in getting ready for the contest. Instead of Giffard's steam-engine, he used the petrol motor of the automobile. To make his craft go



where he wished, there were the steering-rudder, ballast, and guide-rope.

Santos-Dumont's first balloon caught in some trees. Two days later, while returning from a high altitude, it began to fold up like a pocket-knife and descended rapidly.

"Catch the trailing rope and run against the wind!" Santos-Dumont cried out to some boys who were flying kites.

The boys understood at once. The speed of the descending balloon was reduced as the rope was pulled against the wind, and Santos-Dumont came down safely.

Another time, engine back-fire ignited the balloon-bag filled with hydrogen. Santos-Dumont put out the flames with his Panama hat, and continued on his way.

Santos-Dumont built a second balloon, which doubled up and descended in much the same way that the first had done. By chance, the flyer was uninjured.



A third balloon worked fairly well, but a fourth had its propeller placed so that Santos-Dumont had to fly with a gale blowing on him all the time. Then he became ill with pneumonia. After flying the fourth balloon, he had a number of improvements in mind.

With what he called the "Santos-Dumont Number 5," the flyer decided to try for the prize that had been offered.

He chose thin Japanese silk as material for the bag. From the balloon, eighty-two and a half feet long, was hung a wickerwork car. For power, the petrol motor was used.

In this latest dirigible balloon, Santos-Dumont reached the Eiffel Tower in ten minutes. He rounded it and started home. Then a strong head-wind arose suddenly and the balloon ended its flight in a chestnut tree.

A few weeks later, when the balloon had been repaired, a fresh start was made. This time, Santos-Dumont reached the Tower in nine min-

utes' time, but on the way back the gas valves began to leak and the hydrogen escaped rapidly.

Santos-Dumont kept on, but suspension wires caught in the propeller because the balloon sagged so much. The "Number 5" began to travel back toward the Tower, and to descend as well. It slapped against the roof of a hotel and exploded. Paris firemen rescued the flyer.

Later he made a sixth dirigible balloon. With this, he reached the Eiffel Tower, rounded it, and, with only twenty-nine seconds left of the half-hour, landed at the Aero Club Flying Grounds.

As for the prize—since Santos-Dumont was a wealthy man and did not need the money, a part of it he gave to the poor people of Paris. What was left went to the employees who had been helping him.

## *A MAN-CARRYING GLIDER*

WHILE balloons were being tried out, men were also at work on heavier-than-air craft.

About the year 1800, Sir George Cayley, an Englishman, built a glider that he believed would work well.

He called his coachman.

“There is room for a flyer on this glider,” he said. “I should like you to have the honor of being the aeronaut.”

The coachman protested.

Sir George Cayley explained that he was especially anxious for the coachman to be the driver on the glider’s first trip.

The coachman gave in at last.

As he ran downhill with the wax-covered, linen-bamboo glider, the machine was caught by a gust of wind that sent it forward nine





*Photograph by Keystone.*

**LILIENTHAL'S GLIDER.**





hundred feet across the valley! The coachman had all he could do to keep his balance and position.

All the while, Sir George Cayley was watching. When the coachman had travelled the nine hundred feet, the inventor remembered for the first time that he had never worked out a plan for a safe descent of the glider.

Down to the ground with a crash it came, while the inventor rushed to the scene with all possible haste!

It happened that the coachman was uninjured. He shook from himself the tattered pieces of linen and the broken bits of bamboo. Then he addressed his employer.

“Please, Sir George,” he said, “I wish to give notice. I was hired to drive, not to fly.”

The coachman did not know, nor did he care, that he had been the first aeronaut who had ever taken off from the ground and risen in a heavier-than-air machine.

As for Sir George Cayley, he hired another coachman and went on with his work.

“If one had an ultra-light engine of great strength, its power could be used to propel gliders,” he said. The steam-engine Sir George Cayley knew to be too heavy to be used with success. He set about the task of designing an engine himself, but was unable to make it work well.

The biplane which Sir George Cayley made next also failed, but his ideas were good and set other men to thinking about how power might be applied to heavier-than-air craft.

## ENGINE POWER

A COMPANY of four men was formed in England to work out a means of driving heavier-than-air craft by engine power.

One by one, three of the members of the company dropped out, because the jeers and ridicule which greeted them everywhere were more than they could stand. People at that time had little faith in heavier-than-air machines. Much of the company's work had to go on at night under cover of darkness.

William Henson, one of those who withdrew from the company, made plans for a one-winged plane—the monoplane, which we have to-day. Henson's plans were later found to be excellent, but he never completed his invention.

The time came when, of the company of four men, only John Stringfellow was at work. At

the end of five years, he had a glider-plane model which he thought could be driven by engine power. Its wing spread out ten feet and was two feet in width. There were two propellers. A one-cylinder engine had been installed to furnish the driving power.

In June, 1848, John Stringfellow first tried out the model in a vacant factory room. He launched the plane by letting it run down an inclined wire. After soaring for just a moment, the plane fell back with a thump. A broken tail had to be repaired after this try-out.

The second time the plane left the inclined wire it flew the entire length of the room and struck against some canvas, which had been placed as a sort of backstop.

John Stringfellow flew his model outdoors next. It travelled one hundred and twenty feet before it descended.

This flight made the inventor a famous man, although there was room for much improve-

ment in his work. He had designed a power-driven plane that could be made to fly successfully.

Twenty years later, he was able to make an engine that was lighter in proportion to its power than any that had ever been turned out. The engine had enough power to propel an aircraft, but could not be put into general use. With the beginning of a flight, the rush of wind always blew out the flames under the engine-boiler.

John Stringfellow was trying to correct this trouble when he died.

It remained for others to carry on the work.



## *MORE GLIDING*

“HE IS a freak!” This is what the young boys of the neighborhood said when Otto Lilienthal, a thirteen-year-old German lad, made his first attempt to fly.

Otto Lilienthal, together with his brother Gustav, had made wings out of wooden frames covered with linen. With these attached to his arms, Otto would rush down a hill, flapping the wings as though he were after something.

Otto did not like to be ridiculed. When he found the rest of the boys making fun of him, he made his flights by moonlight.

When Otto was nineteen years of age, he and his brother made another set of wings. These were mounted on Otto's back, and were moved by cords connected with his legs.

The brother, Gustav, grew tired when this much had been done. But Otto was not ready to stop. He made a glider of peeled willow rods, with a strong, wax-covered fabric stretched over them. Then, before he tried to fly with his glider, he wrote and published a book, which told what he had learned about flying during his many years of study.

After all this, Otto Lilienthal felt that he was ready to try out his latest glider.

Between the wings of the glider was an opening through which Lilienthal passed his head and arms. His body hung free, below the plane of the wings.

From a spring-board on the top of a hill, Lilienthal would glide down on the air, and land at the foot of the hill. This practice went on until he could balance himself as one does in riding a bicycle.

The hills of Berlin were Lilienthal's next practice-grounds. He built a hut at the top of a

hill, in order that he might take off from its roof.

When he found the winds unfavorable much of the time, Lilienthal moved once more. With the soil turned up by a contractor who was building a canal, Lilienthal had an artificial hill made. The hill was about fifty feet in height. Since the surrounding country was flat and bare, this made a very good place for trial flights.

Otto Lilienthal made over two thousand gliding flights from this and other hills during the years 1891–1896, first with gliders having one plane, later with biplane gliders. The man who had been called “freak” at an early day, became the best aviator of the time.

Lilienthal was the first to learn how to keep a glider stable by moving his legs about under the machine. He was able to control the balance of his plane in this way for a distance of three hundred feet. He could also turn about in the

air quickly, by throwing his weight to the side towards which he wanted to go.

After gliding for five years without power, Lilienthal had a motor built. Enough carbon dioxide to drive him through the air, he had stored in a tank. This, he figured, would keep him in the air four minutes.

The time came to try out the new motor, but Lilienthal wanted to have one more gliding flight first.

So far, there had been no serious accidents. But before making this last gliding flight, Lilienthal had applied a horizontal rudder to his biplane glider. To move this rudder, he had fastened a rope by a band to his forehead. To lift the rudder and make the glider go upward, he would have to move his head forward. To make the rudder return to its normal position, he would have to move his head backward.

Lilienthal had reached a good altitude, when the wind stopped blowing for a moment, and

the glider stalled in mid-air. Because of the new rudder, Lilienthal became confused and lost control. The plane shot down suddenly and, with a crash, struck the ground below!

The fall had been from a height of fifty feet, and Lilienthal's career was over, but his work made flying much easier for those who came after.



## *THE WRIGHT BROTHERS*

WHEN Wilbur and Orville Wright were young boys, their father, one day, brought home a toy helicopter, which he let fly to the ceiling.

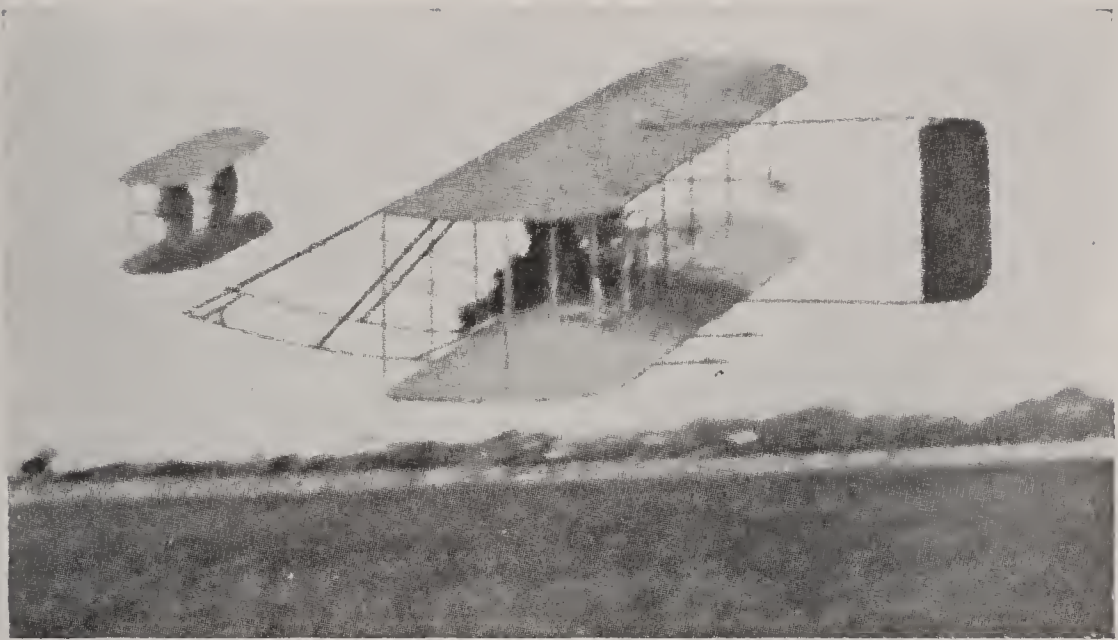
The boys were delighted with this toy, and made it fly until it could no longer be made to work well. Then they made helicopters of their own. Some of these flew easily. The larger ones were not a success.

The Wright brothers came to like the idea of flying, while playing with the toy helicopters. Since the larger ones did not work well, the brothers decided that helicopters could never be made large and strong enough to carry men. Then they began to make kites. In an old bicycle shop they made many different models which were tried out, one by one.

And all the while the brothers were reading everything they could find on the subject of flying. The German, Lilienthal, with his glider, interested them most. They agreed with him that one should learn to sustain himself in the air before applying power to his aircraft.

The Wright brothers started to make gliders. Their first one had two new features:—a horizontal rudder placed in front of the operator, and a method of warping the wings that would keep the glider from tilting sideways when flying or turning. With slight changes, this invention is found on all modern planes. The “aileron,” it is called.

At Kitty Hawk, in North Carolina, the sandy ground is good for the landing of gliders. Each day the winds blow in much the same way. The Wright brothers practised flying in this place for three years. During this time they made nearly a thousand glides and performed many experiments.



*Courtesy of Mr. Grahame-White.*

**THE FIRST AEROPLANE THAT FLEW.**

One of the earliest of the Wright biplanes to make a sustained flight.



*Copyright by Underwood & Underwood.*

**A MODERN FIGHTING SCOUT.**



## THE WRIGHT BROTHERS 67

By 1903, the brothers decided that they had learned enough about balancing. "Now for a strong but light motor to drive our gliders," they agreed.

Here there was trouble, which the Wright brothers ended by making a motor of their own. In this they succeeded so well that they were able to build one with even more power than they had hoped to be able to get.

With the motor installed, and a number of minor difficulties cleared up, the machine was ready for flying in December. It looked much like a glider, but it was larger and stronger, since it had to carry a much greater weight.

"Who shall be the first to carry the machine up into the air, in case it will go up?" This question the brothers decided at the top of a high sand dune to which they had taken their machine. A coin was tossed to see which one should be the pilot. Wilbur proved to be the winner.

He seated himself in the plane, and moved



the controls that would set the engine in motion. For thirty-five or forty feet the new power-driven plane ran along the track from which it was to rise. Then a slip-wire caused it to jump its rail. It climbed a few feet, stalled, and fell to the ground.

Repairs had to be made after this trial, but three days later, the persistent brothers were ready once more.

On December 17, 1903, with Orville Wright as pilot, the machine ran along its track to the end of the rail. This time, driven by its four-cylinder motor, it rose into the air, and sailed along for twelve seconds before dropping down into the sand again.

Only twelve seconds of flying, but it was long enough to prove to the Wright brothers that they had won their fight. They had made the first man-carrying machine that could rise by its own power and fly freely.

Only five persons saw this flight. During all

the years in which they had been at work, the Wright brothers had kept their plans secret.

“People would have thought us crazy,” they explained later. “The only birds that talk are parrots, and they are not birds of high flight.”

Just after the first flight, the Wright brothers sent news of their success to their father in Dayton, Ohio. They gave no accounts of it to any of the newspapers, although a reporter from a Virginia paper read of it, and published an account in *The Virginia Pilot*. Even then, no one was greatly interested. It was not until four years later that the Wright brothers began to receive honors for their work.

The two thought little of this. They had taken up flying as a sport, and they had been having plenty of this, along with their study and work. They kept on making more flights, and, as time went on, made great gains in endurance and speed.

In 1908 Wilbur Wright made a trip to

France, where he won a prize of four thousand dollars, and succeeded in staying in the air longer than had ever been done before. His record was two hours, eighteen minutes, and thirty-three seconds; the distance seventy-seven miles, twenty-two hundred and eighty feet.

In America, meanwhile, Orville Wright had been working for a twenty-five thousand dollar prize, offered by the United States Government for a military plane that would be able to carry two men, fuel for one hundred and twenty-five miles of travel, and be capable of a ten-mile cruise at a speed of forty miles an hour.

Able to fly successfully in the model which he had made, Orville Wright, in August 1909, was awarded the prize of twenty-five thousand dollars, with much honor besides.

## FRANCE TO ENGLAND

“A THOUSAND pounds to the first man who shall cross the English Channel from France to England, in an airplane,” a London newspaper announced.

About one hundred and twenty-five years had passed since the twenty-mile stretch of water had been crossed from West to East. In the opposite direction, no crossing had yet been made.

Louis Bleriot decided to try to make the flight.

Bleriot had met with one disaster after another in the course of his flying career. It was said that he had been in as many as fifty accidents. When he decided to try to make the Channel crossing, he had already lost ten flying

machines in one way or another. The eleventh plane, he had fitted out for the trial.

When all was ready, on the early morning of July 25, 1909, Bleriot had to hobble to his plane on crutches. He had just been burned in an explosion of gasoline, a few days before, and had injured one of his feet. Bleriot had been unwilling to wait for the burn to heal. Another daring aviator had been trying to get off first, and the contest had really turned out to be a race.

Bleriot tossed aside his crutches, as he climbed into his monoplane. He started up the motor, rose one hundred feet, and headed for the shore of England.

Bleriot had neither maps nor compass. In case of fog, he might easily have been lost. If the wind had changed its direction, he might have been blown out to the North Sea.

There were no parachutes at that time. Bleriot would have had only one chance of sav-



ing his life, should he have been forced into the sea. Into the middle of the fuselage he had placed an inflated rubber cylinder five feet long. This would have helped the plane to keep afloat.

No accident befell Bleriot, this time. He headed straight toward what he thought to be the shore of England, and was able to keep going in the right direction.

A French torpedo boat, with a speed of twenty-six miles an hour, had been assigned to follow him. Bleriot, in his monoplane, travelled along at the rate of forty-two miles an hour. He passed the destroyer, and, for a time, could see no ships of any kind.

This did not last long. Bleriot happened to be steering in the right direction, and within thirty-seven minutes he reached the coast of England, near the city of Dover. Through an opening in the cliff, a safe landing was made, although the plane was somewhat damaged.

Because of the early hour, only one person happened to be present when the landing was made. He was a policeman—the first to congratulate Bleriot. There soon appeared other policemen, and a few khaki-clad soldiers from a camp near by.

But since that first day, many people visit the landing-place each year. A monoplane carved in stone has been sunk into the site, as a reminder of the early flight.

## *A TRY-OUT*

AT A nine-day Air Meet, held on Long Island in 1911, the first bag of mail was carried by airplane. Earle Ovington had been appointed official air-mail carrier of the United States Government, and on September 23rd, in a Bleriot monoplane, he carried the first bag from the flying-field at Nassau Boulevard to Mineola, a distance of a little less than ten miles.

Because his craft was only a single-seater and there was no baggage compartment, the bag of mail was carried on the flyer's lap. Since landing would have been difficult under these circumstances, the mail-sack was dropped into the field at Mineola, where the postmaster stood waiting to receive it.

Dropped from a height of several hundred feet, the bag ripped open several times, while

letters and postal cards were scattered in all directions. As the air-mail pilot turned his plane in the direction of his home field he could see the postmaster rushing around to gather up the scattered mail—six hundred and forty letters and twelve hundred and eighty postal cards.

During the time of the Air Meet, over forty-three thousand pieces of mail were carried, and much interest was shown in the new form of mail delivery.

“Within a year, air-mail planes will be travelling the sky daily,” many said.

But this service did not come in so short a time. For the first few years money was lacking. Then came the World War. Seven years, in all, went by before regular air-mail service was established.

## WORLD WAR FLYING

ONE daring feat of the World War was the bombing of a German airship shed, located in an important position, near the city of Ghent.

In the car of a captive balloon, at some altitude, marksmen had been stationed. On the ground, anti-aircraft guns had been placed on guard.

The aviator travelled at a high altitude, and arrived above the shed in the early evening. In his plane he had three powerful bombs and a few hand-grenades.

After some reconnoitering, the fight began.

The aviator could see the airship-shed very clearly below him, and dropped a bomb from his height of six thousand feet.

At once, the men in the car of the captive balloon opened fire.

From the ground came a storm of shots.



The flyer could see that he was too high for accurate bombing work. To go lower in the midst of the rapid-firing enemy guns would invite certain death.

As he flew in a circle above, he could see that just one sort of maneuver might be successful. He decided to take his chances.

He flew exactly above the balloon from which the marksmen were firing. He began to descend rapidly and, as he flew downward, kept his machine going around in small, steeply banked spirals, by means of which he remained so directly above the bag of the balloon that he was out of sight of the marksmen below. He fired his second bomb, but missed his mark.

When just over the balloon, the flyer directed his plane outward with a rapid move. He passed as quickly as he could, then, in small spirals, kept his machine moving just under the balloon.

The men on the ground could not fire on him as much as they wished, for fear of wounding or

killing their comrades in the kite-balloon. The observing marksmen above were hindered in their firing because of the danger of hitting the men gathered about the airship shed below. The excitement was becoming more and more intense.

In the confusion, the airman flew down until within two hundred feet of the ground, then dropped the last of his heavy bombs upon the shed.

The bomb struck the roof, and from within the shed came the sound of a heavy explosion.

Every second counted with the airman. He steered away and, with all possible speed, returned to his base. There were bullet holes in the wings of his plane, but he had received no injury.

The airplane had once more been put to good use, this time in war.

At the opening of the war, the planes that each country had to use were clumsy and could

make little altitude. They were slow, too. But improvements were begun at once.

At first, men flew to observe the movements of enemy troops, or to locate artillery placements or other maneuvers. But neither side was willing to allow enemy planes free flight over its own country. This led to frequent combats in the air.

As the war advanced, airplanes of three kinds came into use: the fighting scout, the observer, and the bombing plane.

Some of the scout-planes could travel at a speed of one hundred and forty miles an hour, and were very nimble in maneuvering. Many of the later ones could dive safely at a speed of three hundred miles an hour. All were equipped with machine-guns, from each of which, a thousand bullets a minute could be projected.

It was dangerous work, because the men had to fly at low altitudes to make note of troop



*Courtesy of the "Graphic," London.*

**BOMBED IN MID-AIR.**

The first Zeppelin destroyed by an aviator single-handed. The airman, a British naval flight-lieutenant, was hurled in a somersault by the explosion of his victim, but landed safely.







movements, new artillery positions, or changes in the trench system of the enemy.

Many of the observation planes carried special cameras with which to take photographs. During the last twelve months of the war, nearly two hundred and sixty-five thousand of these were taken by British photographers behind the German lines, on the Western front alone.

The bombers were powerful machines, strong enough to carry a large number of bombs over a wide area.

The first bombing of the war came in September, 1914, when the German lieutenant, Immelmann, bombed Paris and dropped a note on a sandbag. The note read:

“PEOPLE OF PARIS! SURRENDER! THE GERMANS ARE AT YOUR GATES. TO-MORROW YOU WILL BE OURS!”

The first bombing planes were like any of the other planes, except that the pilot carried a

few bombs with him. These he dropped wherever he thought they might serve the best purpose. Later, special planes were made to carry bombs in racks below the wings. Some of the bombs weighed one hundred and ten pounds each, and were released by a special gear.

In Palestine, just before the British were to make their final attack on the Turks, airmen were directed to fly back of the Turkish trenches to bomb the aerodromes.

The British planes were able to carry out this order so well that none of the Turks' machines could take off. With their "eyes" taken away, the Turks had to fight blindly, and were easily routed.

Kite balloons were of use in the war, for observation purposes.

Zeppelins did some bombing work, but they were a disappointment to the Germans. At first, the Zeppelins ran little risk because the anti-aircraft forces had not been organized. Later,

they were forced to higher and higher levels to avoid gunfire and attacks from airplanes, which usually had the best of it in an encounter. At a great height the cold was so intense that engines froze if they stopped. Some of the airships were frozen up, and drifted over France and Belgium.

The Germans had hoped that the Zeppelins would damage the enemy greatly. Their discouragement about this, as well as the entrance of the United States into the war, helped to weaken their spirit, and to make the winning of a victory much easier for the Allies.

When the United States entered the World War in 1917 it had only two hundred training planes, and not one of these was fit for service in battle. And, although the Wright brothers were Americans, no planes were being built in the United States.

Between December, 1917 and November 16, 1918, a total of ten thousand four hundred and

seventy-two planes had been delivered to the American fighting forces!

Before the war, such movements as loops, Immelmann turns, side-slipping, and rolling were unusual stunts. When the war had been going on for a while, the fighting-scout performed these feats as a part of his everyday activities.

The war, it seemed, left aviation with more and better aircraft, and with highly skilled men to pilot them.

## *AIR-MAIL*

ON MAY 15, 1918, a gathering of people was on hand at Potomac Park Flying Field in Washington, D. C., to witness the beginning of the first regular United States air-mail service. On the edge of the field were army ships, ready to ascend and give honor to the mail-carrying plane. Officials of the Army and of the Navy were present. President Wilson and his wife were in the company, as was the Postmaster-General.

It had been arranged that four airplanes should take charge of the first day's deliveries. One of the planes was to carry mail from the city of Washington to Philadelphia, where a second plane would take it on to New York City. A third airplane would start from New



York, and carry its load to Philadelphia, from which place a fourth plane would deliver the mail to Washington, D. C.

At eleven o'clock the mail pouches were brought out and put into the forward part of the plane which was to make the Washington-Philadelphia part of the delivery. The pilot climbed into the cockpit. Some one came forward to hand the aviator bouquets of flowers, which had been presented by President Wilson and the Postmaster-General. A mechanic made his way to the front of the plane. He took hold of the propeller and gave it a quick turn. There was a choking and sputtering of the motor. Then it stalled. Something was wrong.

The mechanic seized the propeller and gave it a second turn. Still no roaring of the motor.

Hastily, mechanics looked over the engine, but could see nothing that might be causing trouble.

Another mechanic took his turn at swinging

the propeller, but with no better success than the others had had.

At last a shout from one of the men explained everything. *The gas tank was empty!*

At once, fuel was brought for the motor, and the air-mail plane took off without further delay.

Plans had been made for a telephone message to be sent to the watchers at Washington, as soon as the plane should be sighted on its passage over Baltimore.

Thirty minutes passed, and no message came.

The officials looked worried. What had happened? Had there been a forced landing?

The message came in. South of Washington, about twenty-five miles, the pilot had landed. He was safe, and the mail was unharmed. The only damage to the plane was a broken propeller.

The people on the Washington Flying Field wondered how it could be that the pilot was so

far south of Washington, when his destination had been north.

Later, they found the reason. The compass had failed, and the pilot had lost his way in the clouds.

This one air-mail plane, whose take-off the President and the Postmaster-General had chosen to see, was the only one of the four planes which did not finish its trip successfully. The three others went through without mishap, and regular air-mail service was begun.

## THE ATLANTIC CROSSED

WHEN the war had ended, three Curtiss flying boats were chosen by the United States to attempt a crossing of the Atlantic Ocean.

The *NC-1*, *NC-3*, and *NC-4* were to make the trial. They were biplanes and sister ships. The *NC-2* had had to be withdrawn.

Each boat was made with a hull that had six water-tight compartments. The first compartment contained the navigator's cockpit. Just behind, were housed the two pilots. In the fourth and fifth compartments were the oil and fuel tanks. The cabin of the wireless operator occupied the sixth, or stern compartment.

Liberty engines supplied the power.

The route which the flying boats were to follow had been laid out in stages—from New-

foundland to the Azores—the Azores to Lisbon—Lisbon to Plymouth, England.

Along the way, at distances of about sixty miles, United States destroyers were stationed. These were to act as guides, to give protection in case of need, or to help with weather reports.

At 10:03 P.M. on the evening of May 16, 1919, all was ready, and the flying boats took off.

Lieutenant-Commander Albert C. Read, in the *NC-4*, soon took the lead, a position his plane was able to hold throughout the entire course.

The three planes travelled somewhat together for the first hour. Then the *NC-4* commenced to gain on her sister planes, and, by the time the first destroyer had been reached, had to circle around to give the other flying boats a chance to catch up.

On their way again, the *NC-4* gained once more.



## THE ATLANTIC CROSSED 91

At last, Commander Read lost sight of the other planes and proceeded on his way alone.

At 11:25 A.M., Flores Island, the most westerly of the Azores, was reached.

“It was the most welcome sight we had ever known,” one of the men on the *NC-4* said later.

At 1:25 P.M., Commander Read alighted in the port of Horta, having covered thirteen hundred and eighty miles of the first lap of the route without mishap.

The fates of the *NC-3* and of the *NC-1* had been very different. The *NC-1* lost her bearings in a fog, and was forced down in a rough sea, two hundred miles west of the Azores. Her crew was picked up by a Greek steamship on its way from Norfolk to Gibraltar. The *NC-1* was towed for eighty miles, but was left behind when the towline parted.

Forced down on a rough sea, the *NC-3* received injuries as she struck the water heavily. Unable to rise again, she had a chance to show

what she could do in the way of riding out a gale, since no ships could be sighted in any direction.

In the struggle, one engine was torn loose and the hull sprang leaks, but the *NC-3* stood the test very well and sailed with the wind to Ponta Delgada in the Azores, two hundred and five miles away.

The *NC-4* had to be prepared for its second hop, from the Azores to Lisbon. After a week, it was off again, and on May 17, 1919, was made welcome by the people of the Portuguese city. It was the first time that the Old World had had a chance to greet an airplane that had flown from America.

Commander Read did not delay long. Three days later he was off on the final lap, from Lisbon to Plymouth, England. Engine trouble forced the *NC-4* down in Spain, but a few hours later she was off again.

Not long after, within sight of a cheering

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throng, and with ships of the harbor whistling and shrieking their sirens, the *NC-4* passed over the entrance to Plymouth Sound. She glided down to a successful close of her long trip of thirty-one hundred and thirty miles—the first crossing of the Atlantic Ocean by air!

## A NON-STOP ATLANTIC FLIGHT

“FIFTY THOUSAND DOLLARS to the ones who shall first cross the Atlantic Ocean in a non-stop flight.” Just before the World War began, this offer had been made by the *London Times*.

After the Armistice, there were a number of flying pairs who wanted to try for the prize.

One pair of aviators failed when a piece of solder in the radiator came loose and plugged up the water-circulation system. Engine trouble followed, and the men were forced down. Later they were rescued at sea.

A broken axle while taking off spoiled the chances of several others.

Two English war-time flyers, Captain John Alcock and Lieutenant Arthur Whitton Brown (of American parentage), entered the race next.

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About the time that the *NC-4* was getting ready to make the last lap of her flight, Alcock and Brown arrived at St. John's, Newfoundland, with a Vickers-Vimy war-time bomber.

The two aviators assembled the parts of their plane and made a number of short trial flights. Then, on the afternoon of June 14, 1919, they took off, with a northeast wind to help make a speed of one hundred miles an hour for their bomber.

Over the ocean there were the usual fogs and storms that are always found over that great body of water. The men had to fly up and down in search of clear spaces. "Upstairs and downstairs," they called it.

Sometimes they were just over the waves, at other times as high as twelve thousand feet. Twice, the two airmen came very near plunging into the ocean. On one of these times, the pilot had all he could do to straighten out his ship in time to keep it from splashing into the water.



Once, when the two men were trying to go "upstairs" farther, the two feline mascots, Twinkletoe and her black friend, began to scratch at the seat as if having great trouble in clinging to it.

Alcock changed the controls at once.

He had been flying *upside down!*

When the men had been travelling about sixteen hours, a small island came into view ahead.

"If that isn't Easter Island over yonder, I'll drink this jolly ocean dry at one gulp," Lieutenant Brown said to his companion, through their telephone.

The aviator did not have to try to drink the waters of the Atlantic Ocean. He had made no mistake about the land that had come into view.

Within a short time, the two flyers reached Ireland. Beyond the wireless station of Clifden, they saw what appeared to be a level green field. The flyers brought their plane down for

what they thought would be a comfortable, smooth landing. Instead, a sticky bog awaited them! The wheels hit the soggy ground and the plane sank into it deeply, nose downward, end up in the air.

Partly deafened, and stiff with the cold, Captain Alcock and Lieutenant Brown clambered out, unhurt. The two black cats were also uninjured.

Captain Alcock and Lieutenant Brown had not only made the first non-stop flight over the Atlantic Ocean, which won for them the \$50,000 prize! They became Sir John Alcock and Sir Arthur Brown!

Their Vickers-Vimy plane was taken out of the mud, and given a place in the Science Museum, South Kensington, London.

## *CROSSING THE ATLANTIC FROM EAST TO WEST*

THE first aërial stowaway selected an important ship in which to take his free ride. He chose the British dirigible balloon, *R-34*, sent by England to make the first Atlantic crossing from East to West.

The stowaway had worked on the airship as a rigging boy, but it had been decided to leave him behind in order to lighten the craft's load. When found, just after the dirigible balloon left Ireland, he was hiding between the fifth and sixth hydrogen gas-cells, in the rigging. In a feverish condition, he was allowed to rest for a time. Then he was put to work as cook's helper.

And while the first aërial stowaway was working at such small jobs as the cook might have for him, the ten officers and seventeen men

of the crew of the *R-34* had important work to do in order to make the voyage a success.

The large dirigible had been built in Scotland, for use in the World War. She had left her shed at East Fortune, near Edinburgh, on the early morning of July 2nd, only a few weeks after Alcock and Brown had made their West to East crossing.

While mounting slowly, she had been swallowed up in low-lying clouds at a height of only one hundred feet. It would have been dangerous to fly low in the fog, because of the three-thousand-foot hills that cover the north of Scotland. Yet it was hard to gain altitude with such a heavy load of fuel, without throwing out some of it as ballast.

Cautiously, the airship felt her way up the Firth of Forth toward Edinburgh. Through bumpy air, she passed over the Firth of Clyde, on to the north coast of Ireland, and out over the Atlantic.



This is where the stowaway was found.

At a height of two thousand feet, the *R-34* found a clear passage, with clouds above and below. From that time on, much of the traveling was done out of sight of the ocean, with only occasional glimpses through the fog.

Each one on the great airship had his own special work to do. In a forward enclosed car, under the body of the airship, the navigating work was carried on. Enclosed cars, or gondolas, housed five petrol engines.

In command was Major G. H. Scott. An officer of the British Airship Fleet kept the ship's log. An American Navy Lieutenant had been given permission to make the trip as an observer, since the United States was planning to build a dirigible balloon.

With electric lighting throughout the airship, and radium-painted instruments, work continued, watch on watch, throughout the night, as well as in the daytime.



For exercise, there was a walk along the six hundred and forty-five foot girder, which ran from end to end of the framework at the bottom, inside the outer covering. Some of the officers had to climb a ladder which led to the observation platform upon the top of the airship.

For news during the long hours, there were the wireless messages. When it came time to sleep, there were the hammocks slung from the sides of the keel.

On the first day out, a crack appeared in the water-jacket of one of the engines. A mechanic repaired this, with the help of a piece of copper sheeting and some chewing gum.

On the morning of July 4th, icebergs were sighted, and in the afternoon, land could be seen. It was the coast of Newfoundland.

On the morning of July 5th, the hardest part of the voyage began. Such a high wind sprang up that very little progress could be made, even with the five engines running. Major Scott had

to turn inland to avoid the worst of the gale. What made this a serious matter was the small amount of gas in the tanks. To make matters worse, the *R-34* ran into a violent thunderstorm. Later in the day, still another storm made a change in course necessary.

When Chatham, Massachusetts was sighted on the morning of July 6th, not more than five hours' supply of fuel was left in the tanks. Should a head-wind have been met at that time, there would have been no successful ending to the *R-34* voyage.

As it was, the *R-34* was able to reach Roosevelt Field at Mineola, Long Island, with only enough gasoline left in her tanks for another thirty-minutes' flight.

Major Scott had planned to land at New York, but with the shortage of gasoline, had been forced to choose a nearer landing-place.

As the *R-34* circled above the field, one of the officers jumped from the side with a parachute.

He did this in order to be able to take charge of the landing.

One member of the welcoming party was Commander Albert C. Read of the *NC-4*.

“God Save the King” was played with great spirit while the landing was made.

The great airship had covered the thirty-two hundred miles in one hundred and eight hours and twelve minutes, at an average speed of thirty miles an hour.

And the lighter-than-air craft had set up one record for Atlantic crossing that airplanes would have a hard time to beat.

For a few days the *R-34* remained on exhibition. Then, once again, she set off—this time for England.

The return trip was made without mishap, in seventy-five hours.

## *FROM LONDON TO AUSTRALIA*

BLERIOT had pushed his machine to the limit, to cover the twenty miles of the English Channel.

Ten years later, in 1919, when airplanes with greater engine-power were being made, Captain Ross Smith, an Australian airman, was able to travel eleven thousand and sixty miles by air, from London to Australia!

A prize of £10,000 had been offered by the Australian government, to the first one who should make a flight between England and Australia in a British-assembled plane, in less than thirty days, and before the end of the year.

Captain Smith had served with the Australian Flying Corps in the World War. He was an experienced airman, and the idea of making the longest flight of the time appealed to him.



Captain Smith succeeded in getting his brother and two crew-men to join the expedition. A Vickers-Vimy converted bomber bi-plane was chosen.

Captain Smith and his men left London on November 12th, after planning all the details of the proposed trip as carefully as they could. They had studied the route, and knew just where they might land for fuel and provisions.

A chain of aerodromes reached as far as Calcutta, and the route had been travelled before. Beyond, there would be few landing-places, with only one aerodrome, at Batavia, in Java.

The Australians would have to be pioneer airmen over a country where flying was very dangerous.

Captain Smith and his men found mists and fogs at the beginning of the flight. While travelling over France, the plane had to climb to a height of nine thousand feet to rise above the sleet, snow, and fog. At this height the cold was



intense. Frost gathered on the pilot's goggles and made them useless. The flyer had to face an eighty-mile gale without any protection for his eyes. His limbs grew numb with the cold, and he found it hard to operate the controls. And when lunch-time came, the sandwiches were found to be frozen hard.

At Pisa, in Italy, a sticky aerodrome awaited the flyers. The men waited a day, but the wet weather made conditions worse than ever. Captain Smith was anxious to get away, to avoid being held prisoner by the weather. With eagerness, he tried to take off, but as the Vimy rolled slowly forward, she came near standing on her head. In order to keep the tail of the machine down, one of the mechanics threw himself upon it. The plane gathered speed and arose, at last, from the ground. The mechanic was pulled aboard and the Vimy was off.

Bumpy air over the mountains along the way tossed the airplane like a small boat in a storm,

while driving rains near the coast of Greece blinded the men and wet them through and through.

At Cairo, it was learned that Monsieur Poulet, a French aviator, was already on his way to Australia. Although he could not compete for the prize, he had set out to try to make the first flight from the continent of Europe.

Captain Smith and his men tried to overtake Poulet, although the Frenchman had had a start of several thousand miles, and was already in India.

The Australian flyers were tired by this time, and would have liked to stop to rest a day, but the thought of the French aviator ahead caused them to proceed with all possible speed.

Near Calcutta, the Vimy just missed being wrecked when a hawk flew against one of the propellers. No trace was left of the hawk, but fortunately the propeller was only slightly damaged.

At Rangoon, Captain Smith passed the Frenchman, Poulet.

At Signora, on the neck of the Malay Peninsula, the aerodrome was half under water, with tree stumps everywhere about. Only by chance, the wheels of the Vimy missed hitting the stumps, although the mechanics had a tail-skid to repair after the landing had been made. During the night that followed, the machine had to be watched by the flyers because of the strong gale that threatened to carry the plane adrift. The men were soaked to the skin by the time morning came, and not one of them had been allowed a change of clothing, because of the necessity of keeping down the weight of the plane.

When Captain Smith was again on his way, and had reached Surabaya in Java, just twelve hundred miles from his goal, it seemed that the end of the flight had come. The landing-field had been made of reclaimed land which had a

thin, hard crust on top of soft mud. The machine broke through the crust easily and was held fast in the mud beneath.

A siege of digging and pulling ended only when Captain Smith had procured a large number of bamboo mats from one of the town officials. With the mats, a double path was made, nine hundred feet in length. When the mats had been fastened together and pegged to the ground firmly, the plane was once more hauled out of the mud and set upon the matting roadway. The plane could be made to run over the mats, and the delighted airmen were soon off toward their goal, which was now so near at hand.

When the Australian town of Port Darwin was reached, just twenty-seven days and twenty hours had passed since Captain Smith and his men had begun their long journey.

The trip had not been all hardship. Friendly winds had helped them along a part of the way.

Palm-grown islands of the tropical oceans, the greenest of green grass, fertile, irrigated lands, and many unusual scenes of beauty had been a delight to the eye.

Later, at the city of Melbourne, there was the £10,000 prize for Captain Smith and his brother, and a rousing welcome when they visited their home town of Adelaide.

Last of all, the brothers were made Knights as a further reward for their flying work.



## *ACROSS THE UNITED STATES*

LIEUTENANTS John A. Macready and Oakley G. Kelly, two United States Army flyers, had to try three times before they were able to cross the United States by airplane.

“In which direction shall we travel?” the two asked an official of the Weather Bureau, when about to start off for the first time.

“From West to East. The strongest winds follow that path.”

The flyers decided to take this advice, although they knew that they might have trouble getting through the high mountain section of the west before the plane's load of fuel should have been reduced. They would have to make their way through the mountain-passes, and if fog or clouds were present, this might be a very dangerous undertaking.

In the *T-2*, a Fokker monoplane with a Liberty motor, Macready and Kelly took off from San Diego, California.

In spite of a heavy fog, the *T-2* got through the first mountain-pass which was fifty miles away. By the time the second pass was reached, the fog was so dense the airmen could see only fifty feet ahead.

It would have been unwise to try to get through the pass against such odds. The men turned around and returned to the flying field of San Diego.

Once back, the men did not descend, but circled above the field. A note, which they dropped to their officer in command, explained what they were doing. To make up for having to give up the trip which they had planned, they were going to try to beat the world's record for endurance flying.

For thirty-five hours and eighteen minutes, Macready and Kelly remained aloft. They had

earned the world's best record, although they received no credit, since no one had observed or timed them throughout the entire period.

Not long after, the two aviators started on their second trial flight across the United States. This time they flew out to sea several miles, in order to lighten their load and gain altitude. They were able to get beyond the mountains but were only four hundred miles out of San Diego, when a water-jacket around one cylinder was found to have cracked. A second one was seen to be leaking water, a few miles beyond Terre Haute, Indiana.

With a very hot engine, the men were forced to descend at Indianapolis.

“If we ever make another attempt to cross the United States, it will be by covered wagon,” one of the two said jokingly.

After resting awhile, the flyers went on to Dayton, Ohio, where, at McCook Field, they succeeded in breaking the world's record for

endurance flying by remaining aloft thirty-six hours, four minutes, and thirty-four seconds.

This encouraged them to try once more to fly from coast to coast.

“There are a few days of each year, about the last of April, when the prevailing winds blow from East to West,” the Weather Bureau had reported.

“We shall try the East-West route and make use of these winds,” the flyers decided.

From Roosevelt Field, in New York, the start was made on May, 2, 1923, at 12:36 P.M.

As they went on their way, the flyers took turns piloting. While one sat in front at the controls, the other made repairs, looked after the gas and oil, or helped himself to sandwiches, broth, or coffee.

Every six hours, the men changed places.

As night came on, the flyers were over Dayton, Ohio, well ahead of their scheduled time, but with a period of darkness ahead, and clouds



gathering all around. After midnight, the plane came forth from the clouds, into bright moonlight. The men were able to see the fences used as section boundaries, on the ground below. Since these ran north and south or east and west, they were a help in pointing out directions.

Over Kansas and Oklahoma, the tiny lights of towns and settlements, sprinkled here and there over the praries, were visible.

At sunrise, the flyers found themselves at the very place they had wished to reach by early morning. It was Tucumcari, New Mexico, beyond which came the rocky stretch of country so hard to cross.

Even in daylight, and with a lightened load, there was some delay in crossing the mountains. West of St. John's, Arizona, the *T-2* could not make enough altitude to get over the peaks.

For miles, Macready and Kelly flew in search of a pass, until what seemed to be a safe one opened before them.



But instead of leading into a cultivated valley, such as the men had hoped to find, the opening led only to a series of canyons. The flyers had all they could do to turn around in the narrow spaces without hitting the canyon wall.

Out at last, the men found that they had lost their bearings, but flying west, by compass, brought them to Wickenburg, Arizona, where the tracks of the Santa Fe Railroad guided them safely and surely.

The Colorado River, Imperial Valley, and one last mountain range all had to be passed, but San Diego, the goal, was reached finally.

Lieutenants Macready and Kelly had made the trip in twenty-six hours and fifty minutes. This was at an average of nearly one hundred miles an hour over the entire route.

The men were about as tired as any two would be, after twenty-five hundred and sixteen miles of steady flying. As they flew low, in order to make a quick landing, they noticed

that the roofs of the houses were crowded with people who had gathered to see the makers of the first non-stop flight across the United States.

Telegrams of congratulation began to come in, soon after the arrival at the field.

One came from the President, another from a ninety-two-year-old man in New York. It read:

“Congratulations on your wonderful flying, which beats my time made seventy-one years ago, by ox-cart. At two miles an hour, I was five months on the way. Happy to see, in my ninety-third year, so great a transformation in methods of travel. Ready to go with you, next time.”

## KIDNAPED

BESIDES the *Los Angeles*, the United States had one other dirigible balloon in 1924. This was the *Shenandoah*.

The *Shenandoah* was resting at her one-hundred-and-fifty-foot mooring-mast, one day in January, when a storm came up suddenly. All the afternoon the wind blew a gale, and the rain came down in torrents.

The Captain of the *Shenandoah* turned her around, so that her nose would face the gale, but from time to time the wind would give a great *slap*, that made the airship tremble from stem to stern.

The Captain was alarmed. He feared that the great dirigible would be torn from her mast!

The Captain was right. A strong gust of wind

came with force, and roared as it struck, as if to shout roughly, "*Come along with me!*"

The *Shenandoah* groaned and squeaked, but the wind would not give up. The airship was pulled from her mast and carried away by the storm!

Mechanics who happened to be on board, started up five of the engines. Water-ballast was dropped. It was found to be quite useless to try to keep to a regular course, and the Captain did not attempt it. For one reason, he did not know exactly where he was by the time the craft had been brought under some kind of control.

After a while, radio came to the rescue. Messages were received and replies sent out.

"ALL O.K. THANKS, OLD MAN," came in to station WOR. of Newark, New Jersey. This was in reply to a message telling the *Shenandoah* where she was at that time.

"TELL OUR FOLKS NOT TO WORRY. WE ARE

COMFORTABLE," brought relief to many who were wondering about the condition of the men in the craft.

As the hours passed, the wind began to blow less fiercely, and the rain to fall more gently.

Finally the storm blew over, and the *Shenandoah* was able to make her way back to Lakehurst.

A great shout arose from the crowd of people that had gathered, as the dirigible slowly came down. "Goodness knows, I'm glad to be home again," she seemed to say.

Strangely enough, not one man had been hurt, and the airship had received no great injury. A piece of her nose had been torn when the wind had jerked her away, and this part of her battered nose still hung from the mooring-mast.

Aside from this, the *Shenandoah* was as good as she had ever been.





*Photograph by Keystone.*

THE SKELETON OF A GIANT DIRIGIBLE.



## *A RACE WITH THE SUN*

FOUR enemy planes the American aviator, Lieutenant Russell L. Maughan, had brought down in the World War. With a speed of two hundred and six miles an hour, he had won the Pulitzer Race Trophy after the war.

Lieutenant Maughan had had a showy career of flying, but when he announced that he would race the sun across the continent, he attracted more attention than ever.

Macready and Kelly had made the crossing in a little over twenty-six hours. Lieutenant Maughan would have to make still better time to win his race.

Like Macready and Kelly, Lieutenant Maughan had to make three trials.

The first time, he was well under way when the gas-line clogged with dirt and his flight was ruined.



The second time an oil-pipe sprang a leak.

His third try came about a year after the Macready and Kelly flight.

At four A.M. on June 23, 1924, in a new Curtiss pursuit plane, Lieutenant Maughan left Mitchell Field, New York. The sun was just beginning to show in the East, but the moon was shining overhead. There had been fog while the first two trials were made. This time, the weather was perfect.

At Dayton, Ohio, the first stop, there was a delay of an hour for the repair of the starting-handle. At St. Joseph, Missouri, Lieutenant Maughan refreshed himself with cold chicken and a glass of milk. At North Platte, Nebraska, the weather was still good. In Cheyenne, Wyoming, another stop, the sun continued to shine. At Salduro, Utah, there was a refueling and a rest of half an hour, but as the flyer hurried over Nevada, the sun was slowly sinking.

There was no time to waste, then. Lieuten-

ant Maughan raced along, and just as the last bit of the sun-ball was disappearing below the horizon, landed at Crissy Field, in San Francisco.

He had crossed the whole continent in one day between dawn and dusk. In seventeen hours and fifty-two minutes, at an average speed of one hundred and forty-two miles an hour, the twenty-five hundred and forty miles had been covered.

In reply to the greeting of the Mayor of San Francisco, Lieutenant Maughan had a surprise ready. He handed the Mayor a copy of the *New York Times* issued on the morning of that same day!



## *LIGHTING THE WAY*

A MAN stood on the railroad-station platform of a little town in Illinois. He was waiting for the next train, which was to take him to Chicago. Up the track he saw the headlight of the locomotive, which seemed to be two or three hundred yards away.

The man started to get his hand-bags together.

“Plenty of time, sir,” announced the baggage-man, who happened to be passing.

The traveler pointed up the track in the direction of the engine headlight. “The train is coming,” he said.

“Ten or twelve miles away, sir. The track runs straight. That is why the lights show up so well.”

The traveler was Colonel Henderson, Second Assistant Postmaster-General, later known as the "Father of the Air-Mail." He had been given charge of the work of finding a lighting system that would help air-mail pilots in their night travel.

All the way to Chicago, on this day, he kept thinking about how brightly the locomotive headlight had shone down the straight track.

If a locomotive headlight can send its beam a distance of ten or twelve miles, surely a powerful beacon could be made to throw its light much farther, he decided.

Colonel Henderson had already tried out some lights, but none had proven to be of great use.

After seeing the locomotive headlight, he made up his mind that he would try a horizontal, instead of a vertical beam. Electrical engineers were called upon to experiment, and the problem was worked out.

Beacons of four hundred and fifty million candle power were made. Each could revolve three times a minute. Because of the revolutions, an airplane pilot coming from any direction could get the ray of light on a straight line, and be guided by it from a great distance. Everything looked promising.

The first beacon was set up at North Platte, Nebraska, and worked well from the very beginning. The beam could be seen almost one hundred and fifty miles, on clear nights.

On the emergency landing-fields were placed smaller beacons of five million candle power, each beacon twenty-five miles from the next.

Acetylene blinker lights were placed between at distances of three miles.

With the lighting problem worked out, cross-country air-mail delivery came quickly.

On July 1, 1924, the service, much as we know it to-day, was begun. It had taken the train and plane service three and a half days to

carry mail from New York to San Francisco. With night and day flying, the regular time for coast to coast delivery, came to be thirty-three hours, or less than a day and a half!

## *AROUND THE WORLD*

“WHY not take a trip around the world by water?” Away back in 1522, Magellan asked this question. Then he answered it by spending three years in girdling the globe, for the first time, by water.

“Could a trip around the world be made by air?” After the World War this question was brought up.

It was well known that there would be many dangers connected with such a journey—the Alaskan fogs, Chinese typhoons, Indian monsoons, and the rigors of the North Atlantic winter.

Aviators of France, Italy, Portugal, Britain and Argentina had failed in attempts to circumnavigate the globe. Then United States airmen set out to make the flight.



The United States flyers chose a westward, rather than an eastward course. By travelling in this direction they hoped to avoid the terrific eastern storms, and to make the Atlantic crossing before winter.

To take care of possible engine trouble, the route was divided into seven sections, each one containing a depot where supplies of all kinds might be obtained and repairs made.

Four biplanes were fitted out for the expedition, each one equipped with wheels and pontoons for landing. The planes were named after four large cities in the north, south, east, and west of the United States, the *Chicago*, the *New Orleans*, the *Boston*, and the *Seattle*. Each was in charge of able men: Lieutenant Lowell H. Smith and Leslie P. Arnold on the *Chicago*, Lieutenants Wade and Henry H. Ogden on the *Boston*, Major Frederick J. Martin and Sergeant Alva Harvey on the *Seattle*, and Lieutenants Erik H. Nelson and John Harding, Jr. on

the *New Orleans*. In charge of the entire party was Major Frederick J. Martin.

The planes left Seattle, Washington, on April 6th, to follow the western coast of Canada and Alaska.

Almost from the very first, they had to plough through fogs, sleet, and snow.

At Sitka, Alaska, there was a delay of four days because of stormy weather.

On the way again, to Seward, one snowstorm after another made steering to a certain course almost impossible. Much of the time the pilots had to follow what they could see of the coast line, and take their chance of dashing into headlands.

With new supplies, the expedition left Seward and headed for Chignik, an Alaskan salmon cannery station.

The *Chicago*, the *New Orleans*, and the *Boston* reached their destination, but noticed that the *Seattle* was missing. Destroyers later found

that the *Seattle* had been forced down by a broken crankcase, with the usual loss of oil that follows such a mishap. A new engine was ordered later from the Dutch Harbor depot, on the Aleutian Islands, and the other three pilots were told to go on to that place to await the arrival of the *Seattle*.

Major Martin, on the *Seattle*, started out again as soon as a new engine had been installed. In the delay at Chignik three days because of poor flying weather, hundreds of pounds of spray gathered in a frozen coating on his plane, and had to be chopped off before she could rise at all.

In the air again, the Major was anxious to make up for lost time, but a heavy storm blinded him and he lost his way. Against the side of a steep mountain his plane crashed and was wrecked beyond repair.

For two days, the heavy fog kept Major Martin and his companion prisoners in their broken

plane, with only a small amount of food on hand.

The two started out as soon as they could make their way through the fog. In groping along, they almost walked off a fifteen-hundred-foot cliff. Then, for three days, they suffered from hunger, cold, snow-blindness, and loss of sleep as they slowly went about in search of shelter. Their lives were saved when they came upon an uninhabited cabin equipped with food, and containing a rifle.

After waiting in the hut several days for a raging blizzard to spend itself, the two were able to make Port Moller, twenty-five miles away.

The men in charge of the other three ships, in the meantime, had been ordered to go on their way, with Lieutenant Lowell H. Smith of the *Chicago* in command.

Their route from the Aleutian Islands led across the Bering Sea to the Russian Island of



Komandorski, then on to Kashiwabara Bay along the coast of Japan.

Tokio and Shanghai came next, then Hongkong, to reach which the edge of a typhoon had to be crossed.

Farther on, in India, a newspaper reporter suddenly came forth from the baggage compartment of the *Boston*. At Calcutta, he had stowed himself away with his pad of paper, his pencil, and his toothbrush.

The reporter was allowed to remain, but he was made to earn his way by helping with the gasoline and the oil drums. He turned out to be a very likeable fellow, and the men let him ride as cargo for a distance of three thousand miles, until he wished to alight at some point in Europe.

Travelling over Europe, the expedition reached England in safety.

Not until after the departure from England, while the three airplanes were making their



way over the Atlantic Ocean, did any one of them have to be left behind.

At the Orkney Islands, fog caused a delay, but as soon as possible, the airmen were on their way toward Iceland.

Out only a few minutes, the planes ran into a fog bank, which caused the *Boston* and the *Chicago* to turn back. The *New Orleans* went right on, and reached her goal after a narrow escape from crashing in the fog.

The *Boston* and the *Chicago* started out again when they learned by wireless that the *New Orleans* had won through.

Near the Faroe Islands, the *Boston* was forced down when her oil-pump stopped working.

The *Chicago* circled around, but was waved away, as Lieutenant Wade of the *Boston* saw that the greatest service which the sister plane could give would be to summon help.

A wireless call for aid was sent by the *Boston*

to the United States cruiser *Richmond*, while the *Chicago* dropped a note on the Sudero Islands and another close to the United States destroyer *Billingsby*, before hurrying on her way to Iceland.

Before either of the cruisers reached the *Boston*, a trawler arrived at the scene of trouble, and tried to take the disabled airplane in tow as far as the Faroes. Because of the heavy seas, this could not be done.

The *Richmond* came along, and tried to hoist the *Boston* to her decks. In making this attempt the tackle broke, and the *Boston* fell back heavily into the sea.

Once more she was rescued and taken in tow, but sank later, when only a mile from land.

By this time the *Chicago* had joined the *New Orleans* at the Iceland depot, and together, the two planes reached Greenland.

Two hundred miles out of Labrador, the *Chicago* narrowly escaped having to drop out of

the expedition when her fuel-pumps both failed. By pumping for three hours with the hand-pump, Lieutenant Arnold was able to maintain a constant flow of fuel, so that the plane could push on her way. The *Chicago* was still one of the party.

Lieutenant Wade and Sergeant Ogden of the *Boston* had been given a new airplane called the *Boston II*, in order that they might finish the voyage with the other flyers.

From Nova Scotia, the three journeyed together to the cities of Boston, New York, Washington, Dayton, Chicago, Dallas, El Paso, and Los Angeles.

On September 28, 1924, the three ships landed on the ground from which they had taken off on April 6th. The *New Orleans* had needed five engines to make the trip, the *Chicago* six, but twenty-seven thousand, five hundred and fifty-three miles had been covered, two thousand, six hundred and fifty-one miles

more than the distance around the earth at the equator.

To travel this distance, the planes had been on the way one hundred and seventy-five calendar days. Of this, fifteen days, eleven hours, and seven minutes was the flying time.

## THE LOS ANGELES

ONE of the first dirigible balloons owned by the United States came from Germany. At the close of the World War, the Treaty of Versailles had provided that such a craft be delivered.

In charge of Dr. Hugo Eckener, the President of the Zeppelin Company, the balloon left Germany on October 12, 1924. If all went well, she was to be flown across the Atlantic Ocean and delivered to the United States Navy.

As was the case with the *R-34*, which had made the crossing a few years before, all did go well, although there were the usual dangers. Heavy fogs, storms, and winds were met on the way. A rip in a gas-cell which might have caused serious trouble was repaired successfully. At one time the craft was found to be off her course.



The dirigible landed safely at Lakehurst, New Jersey, after having travelled five thousand and sixty-six miles in the longest non-stop flight that had yet been made, most of it over water.

The new craft was given a rousing greeting with bells and whistles.

She became the *Los Angeles* of the United States Navy.

## THE SHENANDOAH DESTROYED

IN SEPTEMBER, 1925, with Lieutenant-Commander Zachary Lansdown in charge, the *Shenandoah* was ordered to visit the cities of Pittsburgh, Columbus, Indianapolis, Kansas City, Des Moines, Milwaukee, Minneapolis, St. Paul, and Detroit.

September is known to bring much bad weather in the Ohio State region.

The *Shenandoah* had not been out long, when she had to battle with a terrific storm near Marietta, Ohio. Driven by a strong current, she was forced upward to a height of thirty-one hundred and fifty feet, within eight minutes. Six minutes later, she was caught by another gust, and dropped three thousand feet within three minutes. Almost at once, she was driven

## *SHENANDOAH* DESTROYED 141

upward again to a height of thirty-seven hundred feet.

The *Shenandoah* was a strong craft, but the twisting currents of air that had come with the storm were too much for her. She was broken into three pieces, and of the crew of forty-two officers and men, only twenty-seven were saved. These men had remained in the forward section of the broken craft, in which they drifted about, as in a free balloon. Twelve miles away, a safe landing was made.

## *FLIGHTS IN AFRICA*

IT PROVED to be hard to travel by air from one end of Africa to the other.

Two men left Cairo, Egypt, several years after the Armistice had been signed. For their plane they chose one of the Vickers-Vimy war-time bombers. In it, they planned to make the first journey by air, over the fifty-two hundred and six miles that lie between Cairo, in the north of Africa, and Cape Town in the south.

Empty gas-tanks forced them to land just outside of Mongalla. The men were delayed in taking off, and had to sleep in their plane in order to keep out of the reach of crocodiles. Wild beasts howled about the plane, and insects gave their usual "biting" welcome.

When the flyers were on their way again, and had travelled more than half the distance be-

tween Cairo and Cape Town, radiator trouble and an overheated engine caused another forced landing.

In coming down, the bomber struck a great ant-hill, and one of her wheels was torn off in such a way that the plane could no longer be used.

A South African Dutchman was one of two men in charge of a second expedition from Cairo to Cape Town. Once again, the intense heat led to radiator trouble and a forced landing, in which the machine was wrecked.

In a new plane, the men continued with their journey, and were able to complete it. But the really successful crossing of Africa, with one machine and the original engine, was made later by Alan J. Cobham of England, in 1926.

In order to avoid the radiator troubles of previous flyers, Cobham chose a radical air-cooled motor for his De Haviland plane. With a photographer and a mechanic, he took off from



England, and reached Cairo without serious trouble.

While making the crossing there were the usual high temperatures. At one time the thermometer registered 160° Fahrenheit near the ground, and 90° as high as seven thousand feet in the air. But the air-cooled motor which Cobham had chosen was able to work well in spite of the great heat, and the journey of eighty-five hundred miles from England to Cape Town was completed in safety, February 17, 1926, a truly great achievement.

Much encouraged, Cobham decided to fly back again, and set out after a short delay.

On the way back, Cobham and his men were amused at the sight of twenty lions making their way along slowly, in single file. The rain and heat were not so amusing, nor was the sand-storm that reached as high as twelve thousand feet.

In spite of all the struggle, Cobham reached

Cairo in nine and a half days, and London less than six days later.

He was received by the King, to whom he gave a letter from the Governor-General of South Africa. It was the first letter that had ever been brought by air from the southern part of Africa to England.

## *RICHARD BYRD FLIES TO THE NORTH POLE*

SEVERAL attempts to fly to the North Pole had ended in failure, when Richard Byrd started to make his preparations.

A Swedish engineer named Andree, with two other brave aeronauts, had set out in a semi-dirigible balloon and had disappeared—never to be heard from again.

Captain Amundsen and five companions were able to advance to a place a little more than one hundred miles from the Pole, in their two flying boats. After being forced down upon the cold Arctic waters, the men were rescued by a sailing ship.

Amundsen thought that polar expeditions would have to be made in dirigible balloons, rather than in airplanes. Upon the return from

his flight, he started at once to get ready for a trip over the Pole.

Amundsen was busy with his preparations when Richard Byrd, of the United States Navy, entered the race. Byrd believed it possible to fly to the Pole in an airplane. He knew something about Arctic air travel because, with Donald B. MacMillan, he had already explored undiscovered land near the Pole.

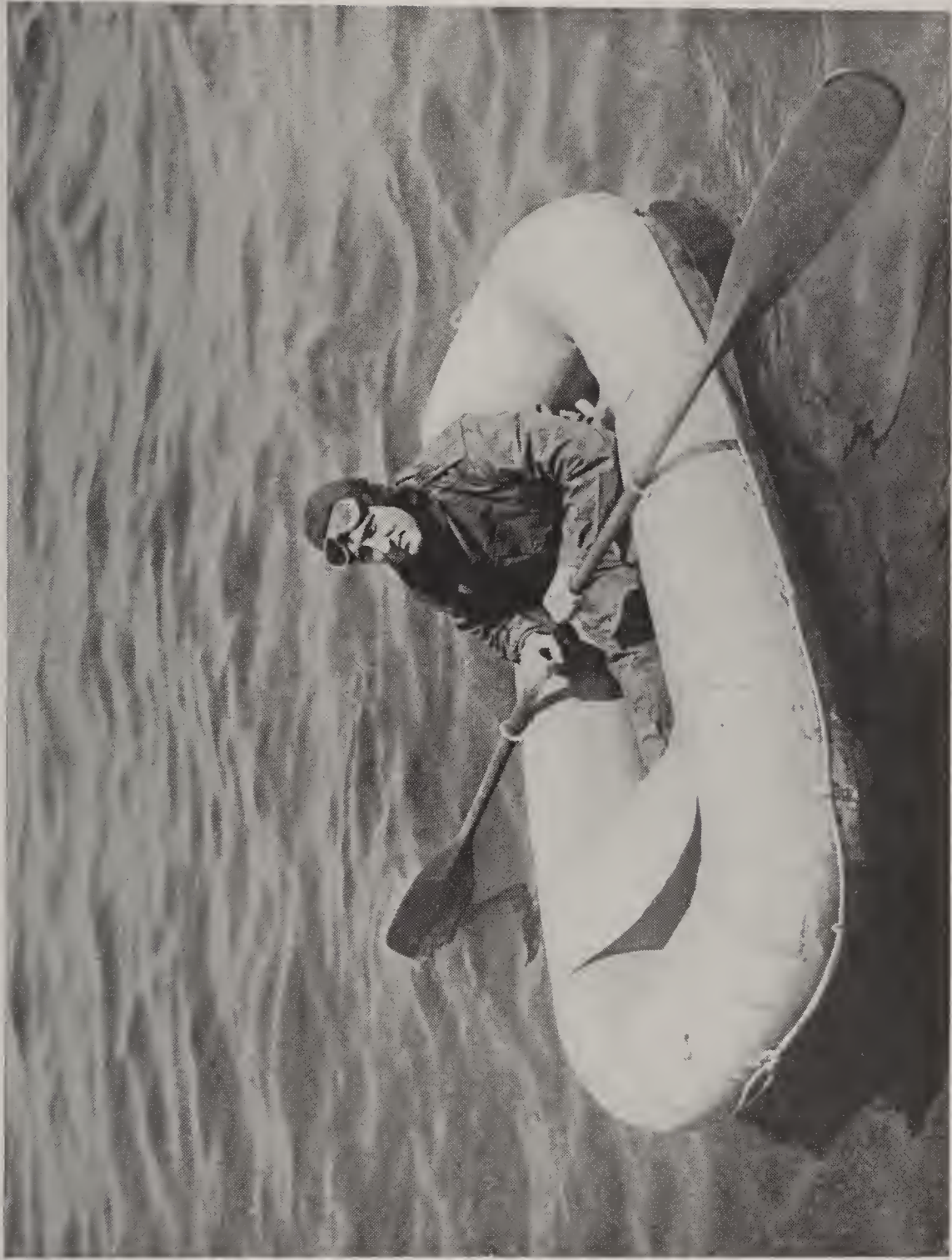
Richard Byrd provided himself with a Fokker plane driven by three powerful motors. The plane was named the *Josephine Ford*, after the daughter of Mr. Edsel Ford, who was one of the backers of the flight. Byrd knew what perils would be on every hand should a landing have to be made in uninhabited regions, and he was prepared to make a fight for his life. Among the useful articles carried in the *Josephine Ford* were a short-wave radio with hand dynamo for sending, a good sled, and nourishing food like pemmican, chocolate, malted milk, sugar,

cream, and cheese—enough to last over a period of two and a half months. A waterproof tent was also carried, as were hunting-knives, axes, a rubber boat, extra shoes and fur clothes, a pistol, a rifle, ammunition, a medical kit, a small gas stove, and smoke bombs.

From the far northern King's Bay, Spitzbergen, the *Josephine Ford* took off, about thirty minutes after midnight on the morning of May 9, 1926, after several crashes in trying to take off from the ice and snow with her heavy load.

Once in the air, she flew over open water along the coast of Spitzbergen for a distance of sixty miles. After this, the course was directly north, into what seemed to be an endless waste of ice and snow. In the bright sunlight, Richard Byrd and Floyd Bennett were able to get a wonderful view of the ice-pack, which reached nearly to Danes' Island. Large fields of floating ice extended back a few miles before the solid





*Photograph by Keystone.*

COMMANDER BYRD IN THE "DOUGHNUT BOAT."

This pneumatic boat weighs ten pounds including the oars, and can be folded up to occupy less than a cubic foot.



pack was reached. The Polar sea, the men had thought, would be a mass of broken ice, but there were some fields of rather smooth ice. Great pressure ridges, from a few feet to fifty or sixty feet in height, ran in every direction, dividing the ice into patches that looked like a crazy-quilt from the air. The fields of smoother ice were between some of these ridges.

Three open leads of water that looked like long, writhing snakes were seen. One of these was wide enough for the landing of a seaplane. The others were too narrow, about thirty or forty feet in width.

Now and then, there would be a lead that had just frozen over a short time before. This fresh ice looked blue against the white of the snow.

For six hours, everything went smoothly. While Floyd Bennett piloted the ship, Commander Byrd made use of his sextant to deter-

mine position, took the drift of the plane, checked the course with his sun compass, and took photographs and motion pictures.

For about twenty minutes of every hour, Commander Byrd took his turn as pilot, while his companion checked up on the amount of gasoline on hand and poured more gasoline into the tanks from the five-gallon cans, of which there were forty on the ship.

When only about an hour's run from the Pole, one of the motors was found to be leaking oil. Commander Byrd noticed the leak from his place in the cabin and took the controls, while his pilot went back into the cabin to see what he thought about the leak.

Floyd Bennett reported that the leak looked bad, and there was no way of finding out just where it was, since the oil tank was well out of reach, and was covered with canvas and asbestos besides.



“That motor will stop,” Floyd Bennett wrote on his pad.

It was decided to try running along for a short distance with the leaking motor throttled down, to see if it would be possible to keep the same altitude with only two motors running.

This the men found they would be able to do, and they continued on their way with the leaking motor, although Floyd Bennett suggested that they make a landing to repair the leak.

Commander Byrd remembered how Amundsen had met with failure because of landing and being unable to rise again. There was so much chance of breaking the landing-gear, or of running into some other trouble, that he held to his plan of keeping to the course and using the leaking motor as long as it might continue to run.

The *Josephine Ford* roared on its way, and at 9:04 o'clock on the morning of May 9th, Com-



mander Byrd knew from his instruments that he had reached the North Pole.

There was no pole standing up, as some children might imagine. The North Pole was just a thick covering of ice in a lonely spot—a weird, mysterious place with no animal or vegetable life.

Commander Byrd did not try to make a landing. He shook hands with his pilot, silently circled the Pole, took a few hasty photographs, and started on the return trip to King's Bay.

Things went well, and Commander Byrd was able to come within a mile of the part of the coast of Spitzbergen toward which he was directing his course.

An hour of flying, and King's Bay was reached in safety, sixteen hours after the take-off.

The leaking motor, the men found, had lost only half its oil. The flyers could not understand this, at first. Later they found that the

leak had been caused by the loosening of a rivet, halfway down the tank.

One of the first men to greet Commander Byrd was Amundsen, who was greatly disappointed because of having to be out of the Polar race, but filled with admiration for the successful flyers.

Both of them he congratulated warmly, and kissed Commander Byrd upon both cheeks.

In a very little while, radio had told the world of the great Polar victory.

## A DIRIGIBLE PASSES OVER THE POLE

FROM Rome to Nome, Amundsen wanted to travel in his semi-rigid dirigible the *Norge*—named after his own country, Norway.

With the Italian Colonel, I. N. G. Nobile, and a crew of seventeen, the *Norge* had left Rome, and was already in Spitzbergen when Commander Byrd and Floyd Bennett returned from their great flight.

The day following the return of the *Josephine Ford*, the *Norge* left Spitzbergen and headed for Alaska, by way of the North Pole.

The aircraft had been equipped with three motors, which could carry the ship along at sixty miles an hour, or more. The dirigible balloon was able to travel eight hours without refueling.

Headwinds and fogs were met shortly after the take-off, but in spite of this, at three-thirty A.M., on May 12th, 1926, the *Norge* passed quietly over the North Pole, at an altitude of six hundred feet.

Norwegian and Italian flags on stout, steel-pointed rods, were dropped, photographs were taken of the ice formations, and observations were made. A wireless message was also sent to the *New York Times*. This message appeared only a few hours later in the issue of May 12, 1926, and was the first wireless message that had ever been sent from the North Pole.

As she went on her way toward Nome, the *Norge* encountered snowstorms and fogs that checked her progress. Ice froze on her rigging, and her gas-bags were pierced by the sharp pieces of ice that were hurled from the revolving propellers.

At Teller, a place not far from Nome, one of the crew jumped to earth with a parachute, and

secured the help of Eskimos of the town in making a landing.

The great balloon had not reached the exact place for which she had set out, but in her thirty-four hundred miles of travel, she had proven that a dirigible balloon can be used in navigating polar regions. She had found, also, that there are no polar continents in the Arctic wastes.





*Courtesy of Aero Digest.*

**THE JOSEPHINE FORD AND THE NORGE.**  
The first aircraft to fly over the North Pole.



## ALONE

BY A quarter of eight on the morning of May 20, 1927, the *Spirit of St. Louis* had been made ready.

Within its enclosed cabin, Charles Lindbergh was ready, too.

“So long!” he cried to those who stood around, waiting to see the take-off.

There was mud on the field. The airplane was heavily laden. It was hard for the *Spirit of St. Louis* to lift herself from the ground, but she rose slowly, and headed for the North and East. Little by little, she gained speed. Before long, she was nothing but a gray speck in the distance.

Charles Lindbergh was off for Paris! And he was making the trip *alone!*

The Atlantic Ocean had been crossed before. But no one had ever flown from New York as

far as Paris, and no one had ever crossed the Atlantic Ocean alone.

“What if he should fall asleep?” people asked.

“Sleet may gather on the wings of his plane, and weigh it down,” others predicted.

“He has only one engine. If that gives out, what will he do?” was asked by others.

“He may lose his way, and run out of gas,” was the fear of many.

And all the time, the *Spirit of St. Louis* was pushing forward across the ocean.

There were storms. High, low, the flyer had to make his way, in order to escape the blinding fog and the heavy sleet. A part of the way, he flew as high as two miles above the water. There were times when he kept within a few feet of the tossing waves.

Once, when the sleet weighed heavily on the wings of his plane, the flyer thought of turning back. But he kept on.

“It might be as difficult behind as it is before,” he decided wisely.

There were cold and dampness all along the way, although a fur-lined flying suit helped to take care of this.

The lone flyer had many miles to go, but he did not fall asleep, as some had feared he would do. Before starting the trip, he had practised staying awake for long hours at a stretch, and had become used to it.

To help keep from losing the way, there were compasses and other instruments. Hour after hour he kept looking at these. He could finish the trip only with their help.

A steady roaring showed that the engine of the *Spirit of St. Louis* was doing its part, too.

After a night of fog, cold, sleet, and wind, morning came. The flyer knew, then, that his chances of reaching Paris were very good.

Several fishing vessels came into view. Land could not be far away, then.



The flyer lowered his plane, until within calling distance.

“Which way to Ireland?” he shouted to one of the fishermen.

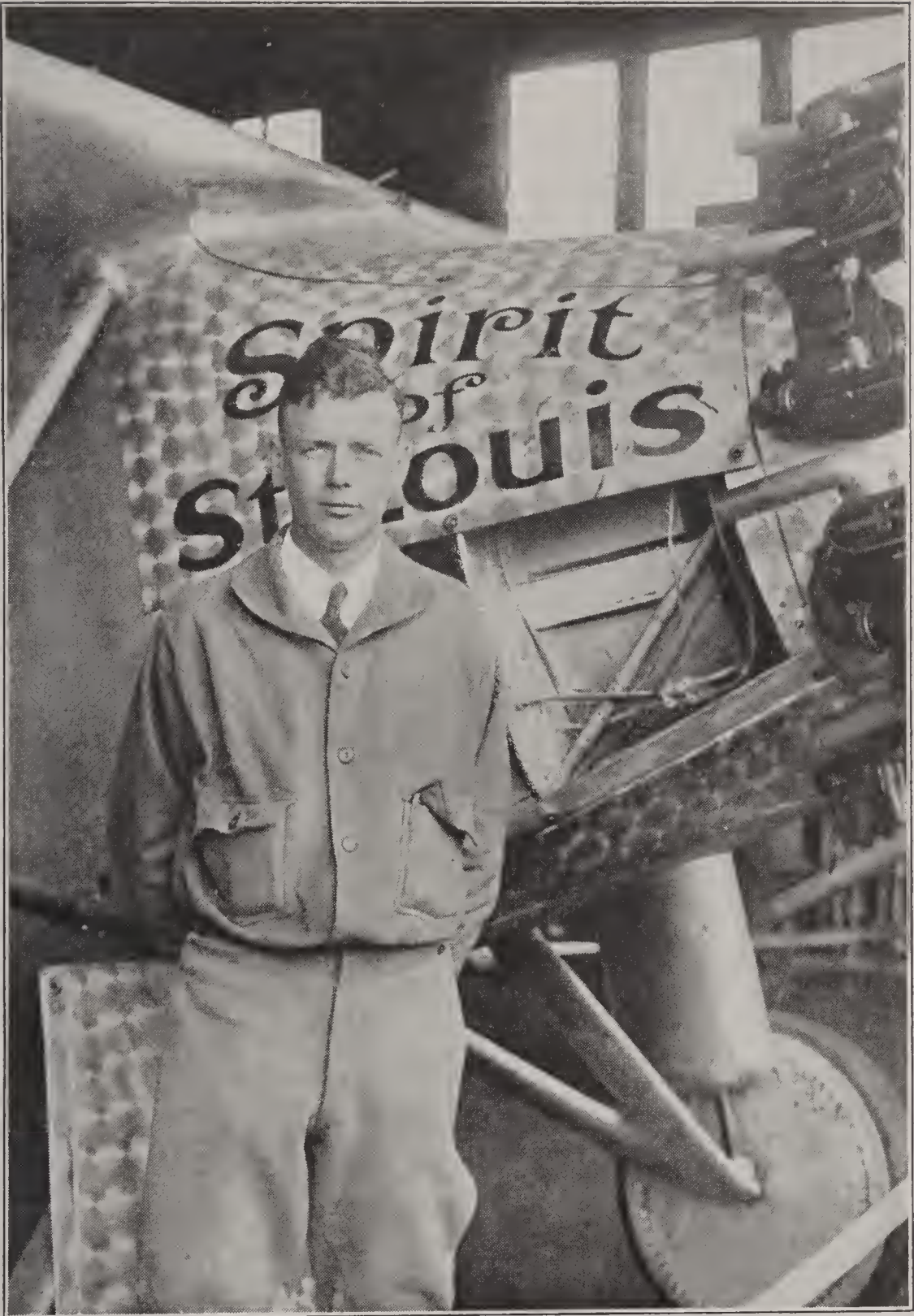
No answer. The man only waved his arms wildly.

The lone flyer had to go on in the direction that seemed right to him.

And it was right. A little farther ahead, land was seen. It was the coast of Ireland!

The flyer did not stop there. It was not his goal. He went on and on, very fast, above neat-looking farms, towns, and villages, then over the waters of the English Channel.

At last, the bright searchlight of the high tower of Paris came into view. The lights of Le Bourget were easily seen, but appeared to be very close to Paris. Lindbergh had understood that the field was farther from the city, and continued to fly northeast for a distance of four or five miles.



COLONEL LINDBERGH ARRIVES AT CURTISS FIELD FOR THE  
NEW YORK TO PARIS HOP.



When he found no other field, Lindbergh returned to the one that he had seen before, and spiralled down close to the lights. Because of the many cars and the long line of hangars, he knew that he had reached Le Bourget. He had reached the end of his journey of thirty-six hundred miles. Amid shouts of a great throng of people, a perfect landing was made at the Le Bourget airport.

*“Lindbergh has done it! He has made the first flight from New York to Paris! And he has made it alone!”* The word had already been passed around.

*“Vive, Lindbergh!”* The people crowded so closely that there seemed to be no use in trying to get away.

Lindbergh was dragged out of the cockpit of his plane, and, for nearly half an hour, was carried around without being allowed to touch the ground.

The French military flyers saw that a rescue



would have to be made. Quickly, at a given signal, they placed Lindbergh's helmet upon the head of an American correspondent.

"This is Lindbergh!" they cried.

The correspondent was really thought to be Lindbergh and was followed by a crowd to the Reception Committee, who had been waiting for some time.

"I am Lindbergh," the man said. Then the people followed him about. In this way the real Lindbergh was able to get away for his much-needed rest, for he had been in the air thirty-three hours and thirty-nine minutes.

The next day began a round of attending dinners, receiving medals, riding in parades, and making speeches. Kings, queens, and great people everywhere took part in the greetings that were constantly given.

As soon as he could, Charles Lindbergh returned to the United States, where the festivities began all over again.



The flyer could not be *alone* very much, for a while.

Wherever he went, people followed. He had become a hero, and the whole world seemed anxious to honor him!

## CHAMBERLIN AND LEVINE

“I SHALL keep on until my gas runs out.”

This answer Colonel Clarence D. Chamberlin gave, when asked where he was going in his Bellanca plane, the *Columbia*.

Chamberlin was about to leave Roosevelt Field on the morning of June 4th, 1927, two weeks after Lindbergh's flight to Paris, when Charles Levine, the owner of the *Columbia*, climbed into the cockpit. Only Chamberlin had known that Levine was to make the journey, and was to be the first transatlantic airplane passenger.

There was ideal flying weather for a while, then headwinds and fogs. With the coming of darkness, great icebergs could be seen floating along on the dark surface of the North Atlantic. The icebergs looked like huge ghosts, but there

was something comforting about having them there. It would be possible to land upon one of them, if a forced landing had to be made.

At midnight, there were fogs again, and blind flying. Once, when Chamberlin looked through an opening in the clouds, he saw a steamer passing below. He signaled with his pocket flashlight, hoping that the radio operator would reply with a message which would reveal his position. But there was no answer.

Shortly after the rising of the sun, another fog area gave the aviator a choice between flying "blind" again, or trying to get to a clear space above the clouds. Chamberlin chose the latter, because in flying "blind," the instruments are not always dependable.

When the plane had reached her "ceiling," or highest altitude, the fogs were still present.

Down again, to a place only a few hundred feet from the waves, Chamberlin found a clear area, from which a passing tramp steamer could

be seen. The crew of this ship waved their handkerchiefs but, strangely enough, did not send out a radio message about having seen the plane. Millions of people were waiting to hear such a message on that night, and would have been delighted to hear of the safety of the daring flyers.

At eleven-thirty on the morning of June 5th, the *Columbia* came within sight of the ocean liner *Mauretania*, three hundred and sixty miles west of the Scilly Islands. The *Columbia* flew low over the great ship. The passengers cheered and waved, while the radio operator sent out a message, telling that the *Columbia* was still making progress.

Chamberlin, in the meanwhile, circled about while he got his bearings, then headed his plane in the direction from which the *Mauretania* had come.

As the *Mauretania* steamed away over the western horizon, the two men in the *Columbia*

could see, far to the south, the great gray body of the U.S.S. *Memphis*. She was carrying Charles Lindbergh and his *Spirit of St. Louis* back to the United States.

Chamberlin headed eastward at terrific speed, and was soon over the green fields and well-kept farmlands of England. He knew that he could land on these in safety, but he had another night ahead, if he would go farther than Paris and better Lindbergh's record. Chamberlin had Berlin in mind, although he was not sure that he could reach it.

Conditions looked favorable then, but trouble came soon after.

Clouds and fogs soon shut off the view of land and water. To an altitude of twenty-one thousand feet the men had to climb.

At this height, water from the mist collected on the wings, and froze. To make matters worse, the men did not know their exact location. They decided to zigzag around until the sun



should rise. Then the frozen mists would melt from the wings of their plane, and besides, they would be able to see where they were. If they flew ahead, there was danger of striking the Hartz Mountains.

Chamberlin decided to take a short time off for a snatch of sleep, while Levine took the controls.

While Chamberlin dozed in the cabin, and Levine was left in charge, the plane suddenly went into a nose dive.

Quick as a flash, Chamberlin awoke and grabbed the controls. Down three miles the plane fell before Chamberlin was able to right her again! It was a narrow escape from almost certain death!

With the coming of daylight, the flyers could see that they were over German soil.

As they approached the flying field of Dortmund, Chamberlin flew low, and shouted to a group of Germans, "*Nach Berlin?*" ("To Ber-

lin?"'), then flew in the direction pointed out in answer to his question.

As the flyers neared the Hartz Mountains, for the first time since leaving the United States the motor began to sputter.

At once Chamberlin prepared to land, and in a very short time had brought the *Columbia* down upon a wheat field. From people who arrived at the scene, he learned that he was near the small town of Mansfeldt, not far from Eisleben.

Once more the flyers asked for directions to Berlin, and with fresh gasoline, were ready to go on again.

This time, Chamberlin lost his way in the darkness, and found himself over the flying field of Cottbus, seventy miles southeast of Berlin, where motor trouble forced him down again.

The landing was made on marshy ground, and one of the propeller blades was broken.

The flyers had to delay their journey until a new propeller could be secured, but on June 7th, 1927, at Tempelhofer Field, outside of Berlin, the *Columbia* landed before a crowd of one hundred and fifty thousand people.

Although the men had not flown direct to Berlin, which they had had in mind for a landing-place, Chamberlin and Levine were happy to know that they had arrived safely on German soil.

And in forty-two hours and forty-five minutes, they had made a new long-distance record for their non-stop flight of three thousand, nine hundred and eleven miles.

## *THE GOOD-WILL MESSENGER*

“WE SHOULD like to have you visit Mexico City.”

The President of Mexico sent this message to Charles Lindbergh, not long after the great flight from New York to Paris.

Charles Lindbergh decided to accept the invitation. He planned to visit other countries south of the United States.

“It might be well to extend to them the goodwill and the greetings of the United States,” he suggested.

The trip south was not an easy one. To reach Mexico City, the plane had to be driven through heavy fogs, strong headwinds, and breezes.

“LINDBERGH LOST”, American newspapers had for a headline at one time. It seemed that

the messages of good-will might never be delivered at all.

Fortunately, after flying about for a while, Charles Lindbergh found his way at last, and reached Mexico City in safety.

At this first landing-place, Charles Lindbergh took the President of Mexico for his first ride in an airplane. At this place, also, Charles Lindbergh saw his first bullfight. For the first time, the flyer met the young woman whom he was to marry. He also delivered his greetings and first message of good-will. It seemed to be a *first* time in more ways than one for the gallant aviator and for others.

After leaving Mexico City, there were rugged mountains, steaming volcanoes, and thickly grown jungles. In some places, the natives rushed out of their little thatch-roofed huts when they heard the roaring of the motor. The natives had never seen an airplane before. No one knows just what they might have done





*Photograph by Keystone.*

*THE AMERICAN CLIPPER.*

Col. Lindberg piloted this amphibian on its maiden flight from North America to South America, initiating the regular passenger service between Miami and Cristobal.



to Charles Lindbergh or his plane, if there had been a forced landing in their midst.

Charles Lindbergh flew over many hundreds of miles of country. Sometimes he flew high. At other times he took his plane so close to the ground that he could see plainly the mango and the palm trees, great plantations of coffee, and birds of gay plumage.

Great crowds of people were gathered at each landing-place. On one field, so many had assembled that the messenger had to drop a note asking that the police clear the field, before a landing could be made.

Over the Panama Canal, Lindbergh flew, too. At this place he must have thought of the time, a number of years before, when his father took him to see the great canal while it was being built. The little boy had not known that a few years later he would be flying over the same place in an airplane.

In all, Charles Lindbergh visited twelve

countries besides Mexico, and talked with people of all sorts, from presidents to humble natives.

Everywhere, the coming of the messenger caused people to think more about flying. Some of them wondered that, in a few hours, Charles Lindbergh could travel over the wild part of a country that they had to take days to cross, with their slow ways of travel.

And everywhere, Charles Lindbergh delivered his message from the United States.

“I come to bring greetings.” In all countries the message was delivered.

No one had ever visited so many strange lands in this way before. It seemed that every one felt more friendly toward the United States, because of the *good-will messenger*.

## PACIFIC OCEAN FLIGHTS

*Out of gas!* The Navy flyers who first tried to cross the Pacific Ocean in 1925 had this trouble, and, although they were eighteen hundred and seventy miles out of San Francisco, there were still many miles to go.

The flyers gently lowered their seaplane until it rested upon the ocean, then began at once to look around for help.

On the second day adrift, a ship came into sight. It passed at a distance of a mile, but no one on board noticed the seaplane.

With their radio, the flyers could receive messages but could send out none. They could hear the searchers tell what they were doing, and knew from what they said that help was very far away.

As the days passed, food became mouldy and drinking water very scarce. Rain that col-



lected in the hollows of the sails, the men drank, at times.

These sails were made from the lower wing-fabrics, and helped the seaplane to move along at a speed of fifty miles a day. Four hundred and fifty miles had been covered in this way, and the men were nine days out of San Francisco, when they were discovered by a submarine. Distress signals, which the flyers had made by burning pieces of wing-fabric in a bucket, had been seen by the submarine crew.

Fresh water and food were given the flyers, and the seaplane was towed by the submarine to the harbor of the nearest Hawaiian Island. There a power boat came along and took the towing-line and helped them to anchor.

As for the weary travelers—their faces were browned from the hot rays of the tropical sun. Each man had a heavy growth of beard. They had been unable to make the first flight to the Hawaiian Islands without stopping, but they

had had a boat ride that they would not forget very soon.

Two years later, several Army flyers made the first non-stop crossing of the Pacific, from the United States to the Hawaiian Islands, in their large tri-motor Fokker monoplane.

They were Lieutenants Lester J. Maitland and Albert F. Hegenberger.

On June 28th they left Oakland, California. In twenty-five hours and fifty minutes they were at Wheeler Field, Honolulu, twenty-four hundred miles away.

Only very skillful aviators could have made this Pacific crossing. A mistake of just two degrees, and they would have missed their goal. In the Pacific Ocean there is no other body of land until one reaches the Solomon Islands, twenty-five hundred miles farther away.

It was a genuine flight. It was the longest non-stop over-sea flight that had been made by an airplane.

## *A COSTLY RACE*

FIRST prize, twenty-five thousand dollars!

Second prize, ten thousand dollars!

These were the amounts offered for the fastest crossing of the Pacific Ocean, in what was known as the Dole race, which took place about two months after Maitland and Hegenberger had made the first non-stop crossing of the Pacific.

There were fourteen entrants, but only eight of these crossed the starting line. Of the eight, four had to turn back because of fog. The other four raced ahead at topmost speed.

Art Goebel and William Davis, in their *Woolaroc*, reached Honolulu after twenty-six hours and seventeen minutes in the air. Two of the contesting planes were lost at sea. One of

them carried a woman—a school-teacher named Mildred Doran. In all, ten lives were lost.

There was not much interest in events of this kind after the sad ending to the Dole Race. “Too costly,” people said.

## *THE WILKINS FLIGHT*

AMUNDSEN and his crew of men had already flown from Spitzbergen to Point Barrow, Alaska, and then on to their landing-place not far from Nome.

An Australian, Captain George H. Wilkins, and a Norwegian, Lieutenant Carl B. Eilson, planned next a flight in the opposite direction, from Point Barrow to Spitzbergen.

Thirty-three Eskimos had to shovel in the snow for two days, in order to make a runway for the take-off. The plane had been equipped with skis, but refused to rise, time and time again. And with each failure it had to be hauled back again to the starting point.

In the air at last, on April 15, 1928, the Lockheed Vega tri-motored monoplane followed a



## THE WILKINS FLIGHT 181

route over a wide polar sea, which carried her two hundred miles south of the Pole.

Twenty-five miles from Spitzbergen, at a place called Dead Man's Island, the flyers were forced down by a terrific storm, and were delayed for five days by drifts of snow four feet high, over the runners of the plane.

When an attempt could be made to take off again, Wilkins had to help the engine by getting out and pushing on the tail of the plane. The plane took off, but, unfortunately, Wilkins had slipped off the icy fusilage and was left behind.

Eilson had to bring the plane down to earth, after which Wilkins repeated his pushing job. A second time he slipped, and the plane rose without him. Again Eilson had to make a landing.

Finally the pushing of the plane succeeded, and the men were able to continue on their way.

When Captain Wilkins and Lieutenant Eil-son reached Green Harbor, Spitzbergen, they had been in the air twenty and one-half hours, and had flown twenty-two hundred miles.

Later in the same year, on December 27th, the Australian and Norwegian airmen made the first flight over Antarctica.

## A SAD STORY OF THE NORTH

UMBERTO NOBILE had flown from Rome to Nome with Amundsen, across the North Pole. But he wanted to take charge of a polar flight of his own.

By easy stages he flew from Milan to King's Bay, Spitzbergen, in a dirigible balloon which had been named the *Italia*. From this point, on May 23, 1928, he took off for the North Pole.

"We have reached our goal," a wireless message reported on the day following.

"All is well. We are returning home," came on the 25th of May.

Then — a violent storm — and no word.

For a long time it was not known what had happened. Then, from a place two hundred and twenty miles from her base, came an S.O.S. call from the *Italia*. Ice had formed on the bag

of the great dirigible. As she crashed upon the frozen polar sea, ten of her men were thrown out, one of them killed. Six more were still aboard, as the *Italia* drifted away again to the East.

At once, rescue parties began to gather at Spitzbergen, by ship, dog team, and airplane. During the next few months, numbers of men risked their lives trying to aid the survivors of the unfortunate expedition. Famous men joined in the search, and five nations took part in it.

In June, at a place about two hundred miles from King's Bay, an Italian Major espied a tent which had evidently been dyed red to attract attention. By parachute, the Italian Major dropped 650 pounds of food. Since the ice was breaking up about that time, he was unable to land his plane, but returned again and dropped more food, clothing, and tobacco.

A few days later, a very skillful Swedish avi-

ator managed to land on the treacherous ice. As he had suspected, the men he had seen from above were survivors of the Nobile expedition. Nobile himself was there, with his chief engineer and four others. The navigator, the pilot, and one other had set off on foot in an attempt to reach the mainland.

The Swedish aviator took Nobile to Whale Island, Hinlopen Strait. He returned, after a while, for another man, but crashed in trying to make a landing, and he, himself, was a prisoner on the frozen sea.

Meanwhile, other rescuers were at work. Amundsen, who had sailed with Nobile on the Rome to Nome flight, was himself lost in trying to rescue some of the Nobile party. In all, twenty-four planes took part in the exciting hunt for stranded members of the ill-fated expedition.

In July, a Russian ice-breaking ship found the two men who had been the pilot and naviga-



tor. They had been on the ice forty-three days, and for thirteen days had had no food.

As for the men who had been carried away in the *Italia* after the crash, nothing was heard from them.

In all, twelve members of the Nobile party perished.

The Expedition had turned out to be the most disastrous of all the polar flights.

## THE SOUTHERN CROSS

AFTER the Pacific Ocean had been crossed by air as far as the Hawaiian Islands, men wanted to go farther.

Australia, more than seven thousand miles away, became the goal of four daring men. Two Australians, Captain Charles Kingsford-Smith and Captain Charles Ulm were pilots. Two men from the United States, Harry W. Lyon and James Warner, were the navigator and the radio operator respectively.

The men planned their trip slowly and carefully. Then, in their tri-motored Fokker plane called the *Southern Cross*, they left Oakland, California, on May 31, 1928.

Honolulu, the first stop, was reached in safety.

The next stop was to be Suva, Fiji Islands,

three thousand one hundred and thirty-eight miles away.

Favorable weather helped the men along the first half of this hop. Rain storms, head winds, and bumpy air made the night a very hard one for the flyers, but the second hop ended with a successful landing.

The third and also final landing-place was reached only after a fight with violent storms all the way.

But in Sydney, Australia, on the 9th of June, the men arrived safely.

Another record-breaking flight had been made.

## THE BREMEN

THREE airplanes had been lost in trying to cross the Atlantic Ocean from East to West, when the *Bremen* was fitted out for this same flight.

Two Germans and an Irishman were to be in charge of the fourth attempt to fly over the Atlantic in this direction. The men were Captain Hermann Koehl, Baron Gunther von Hunefeld, and Commandant James Fitzmaurice.

The *Bremen* was a Junkers monoplane, which had been constructed with the greatest care. In a plane of duralumin, which is as durable as steel, and as strong and as light as aluminum, the men believed that their lives were perfectly safe.

“No radio, life preservers, or boat; no emer-

gency dump-valve," they said. "We shall not need them. By going without them, we shall have room for more gas."

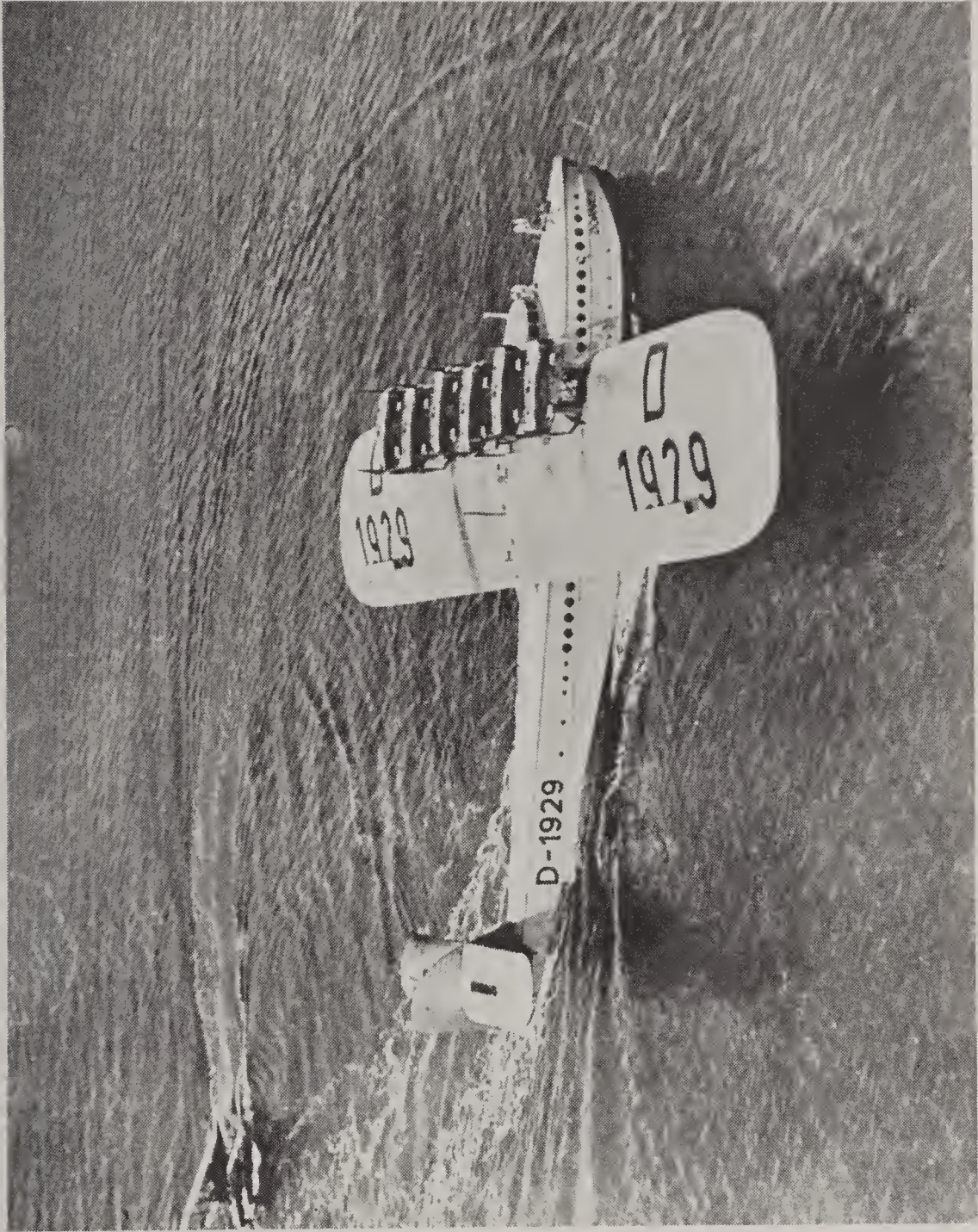
The *Bremen* left Baldonnell Airport, the military flying field on the outskirts of Dublin, on June 12, 1928. The ship flew two flags, — the black, red, and white of Germany, and the green, white, and gold of the Irish Free State.

In the sunshine, above a calm sea, the men flew during the first day out.

With the darkness came strong head winds, followed by a terrific blizzard. Thick layers of ice formed on the wings of the plane. Like a helpless kite, the *Bremen* was tossed about, out of one storm into another. Failure of the plane's lighting system did not give much encouragement.

While one of the flyers worked in great haste to repair the electric lights, the instrument board was in darkness, although a pocket flashlight helped a little.





*Photograph by Keystone.*

*THE DO-X AT MIAMI.*



While the men were flying "blind" in the darkness, they were drifting out of their course. When the lights were repaired at last, it was found that they had flown northward four hundred miles!

With the coming of daylight, the aviators checked on their position again, and found that they were very far from their course. They flew westward, only to find themselves in the midst of fog and storm areas.

By this time their gasoline was getting very low, and the men knew that they would never be able to reach their goal of Mitchell Field, New York. What they hoped to do was to land in civilized territory, where they could refuel and go on again.

From a sea of fog, through a break in the clouds, the flyers saw a lighthouse located on an island. They chose the middle of a reservoir for landing, and swooped down.

As the plane landed, the ice gave way, and



the ship nosed over. This left her with a broken chassis and a bent propeller. It was her worst mishap, after thirty-four hours spent in crossing two thousand miles of water.

The men were nearly exhausted, but were greeted warmly by the keeper of the island and some fishermen, while a lunch of crackers and milk was provided. The flyers were told that they were on Greenley Island, Straits of Belle Isle. Only seven families were living on the desolate island, but the men were made to feel at home.

Meanwhile, the lighthouse keeper sent word of the landing to the Point Amour wireless station, across the Straits, on the mainland.

Just three days later, rescue planes appeared, to the great relief of the stranded men.

The *Bremen's* engine was found to have suffered from exposure, and since, besides, there was no space for a good take-off on wheels, it was decided that the crew should fly to New

York in the Ford relief plane which had been sent for them.

In New York, the usual hearty reception was given. Many were thrilled because of the daring flight. Still others rejoiced because the trip had been made by men whose countries had been at war a few years before.

“With the end of the war, peace between nations has really come again,” was the thought expressed by many.

The *Bremen* to-day hangs in the Grand Central Station in New York City. It was the first plane to make the non-stop, westward hop across the Atlantic!



*THE FIRST WOMAN TO FLY  
THE ATLANTIC*

AMELIA EARHART knew how to fly an airplane, but for a while she spent much of her time helping to take care of poor children in Boston.

One day, while at work with some of the children, the telephone rang.

Miss Earhart quieted every one, and stepped to the telephone.

“Would you like to take a dangerous trip in the air?” was the question which came over the wire.

“A dangerous trip in the air!” Amelia Earhart had already taken a few of these. What could the strange person have in mind? And who was calling? She would have to find out

all about this, before an answer could be given.

“I will meet you later in the day, when I am through teaching,” Amelia Earhart replied.

At the meeting, Miss Earhart found out that the stranger was a skilled flyer, who was about to try to cross the Atlantic Ocean by air.

“Would you like to be a passenger in the airplane?” he asked.

Amelia Earhart could fly well, herself, and she loved to travel about in an airplane. It would be a great adventure to try to cross the Atlantic Ocean! No woman had ever done this before! Several had lost their lives in trying to do so.

“A ship with a woman ain’t got no luck,” sailors had said.

It did not take long for Amelia Earhart to decide what to do. *She would go!*

Not long after, on June 17, 1928, in a trimotored Fokker monoplane called the *Friend-*

*ship*, two men and a woman were on their way across the Atlantic Ocean. The men were the pilot, Wilmer Stultz, and a mechanic Louis Gordon. The three used a seaplane that had two pontoons upon which the plane could rest, should a landing have to be made in the water.

The woman passenger, Amelia Earhart, sat upon a pile of clothing, because there were no other seats, and not even real cushions had been taken along, because of lack of room. She kept looking about, and writing in a diary a part of what she saw.

Over Newfoundland, the outlines of lakes amused her. Some looked like huge footprints, others like great buffaloes, while a few had the forms of strange animals that lived many years ago.

The Atlantic Ocean is a great place for storms. The *Friendship* ran into the worst one that Amelia Earhart had ever met in all her flying!

When there were no storms, it seemed that fogs were doing what they could to hinder the travelers. Sometimes the flyers rose up above these, and the fluffy tops of the fog could be seen below. At other times, wisps of cloud floated past the cabin windows.

When the sea was not hidden, it seemed to be wrinkled like the back of an elephant, Amelia Earhart wrote in her diary.

Most of the time the fogs were so thick that the ocean was completely hidden! Instead of looking out upon a sea of water there was only a sea of fog!

The pilot had to guide the airplane with only his instruments to aid him. Much of the time he could see neither sky nor water — nothing but mists and clouds.

Three oranges and a dozen malted milk tablets made up the only food Amelia Earhart had during the entire trip, although there were three huge sandwiches, coffee, pemmican, oat-

meal cookies, and chocolate bars from which to choose.

A part of the time Miss Earhart had to write in the dark, because she did not want to turn on the electric light in the cabin, for fear of blinding the man at the controls. She used the thumb of her left hand to help keep the place. The trouble was in knowing where to begin a new line. Even with the help of the left thumb, two lines often piled up, one on the other, in an exasperating manner.

Amelia Earhart had strange sights to record in her diary, and beautiful scenes as well.

At times, the sun shone through rifts in the fog, with a warm pink glow. In the early morning, the patches of fog looked like dragons, sea serpents, and teddy-bears. A strange view this was, until melted away by the warmth of the sun.

When the *Friendship* had been in the air nineteen hours, it was found that there was left



only enough gasoline for an hour's flying. The fog was still around, and the radio dead.

The pilot had a serious look. He hardly knew what move to make. Nor did the mechanic. They just kept on flying in what seemed to be the direction in which they had been going.

After a while they flew low, not far above the ocean. They were surprised to see a great steamship coming along. It was the *America*, they found later.

The pilot of the *Friendship* scribbled a note, in which he asked about the location of his ship. To the note Amelia Earhart tied an orange, for a weight. The *Friendship* circled around above the *America*, and the orange was dropped.

It happened that the wind was blowing hard. The *Friendship* was travelling fast. The steamship was also making good time. Because of this, it was hard to make the orange land upon the boat. Two notes were lost before the flyers decided that they would have to go on

their way, and try to reach land somewhere without help.

All were in danger. Each of the three knew this well enough.

Without thinking what he was doing, the mechanic helped himself to a large egg sandwich, and began to eat it slowly. Perhaps it helped him to think better. He said later that he did not know, himself, just why he should have tried to eat a sandwich at such a dangerous time.

When the gasoline was nearly gone, and all were about to give up hope, the mechanic suddenly gave a shout, and threw what was left of his sandwich out of the airplane window, as far as he could throw it!

*"Land!"* he shouted. *"Hooray!"*

The three looked ahead. A dull bluish outline could be seen in the distance.

*"Yes, it was land!"*

A little later, fishing vessels appeared on the

waters of the ocean below. This was a sure sign that land was near!

The three were very eager then!

And when they landed at Burry Point, Carmarthenshire, Wales, a little later, it seemed that one of the happiest days of their lives had come. They had not reached the exact place for which they had set out, but they were all safe, and they had crossed the Atlantic Ocean!

As they stepped ashore, a crowd surrounded them with greetings and praises.

Every one seemed eager to welcome the two men and, especially, the first woman to cross the Atlantic Ocean by air.

## FIGHTING FOR ALTITUDE

LIKE all men who try to fly to great heights, Lieutenant Apollo Soucek, the United States Navy flyer, had to fight for the altitude record which he made on May 8, 1929.

When four miles up, he began to feel the very cold air around his eyes. He had taken off his goggles in order to get a better view of the country which lay beneath him, and the horizon, fifty miles away.

As the plane climbed higher, the cold became more biting. Lieutenant Soucek had to put on his goggles, to keep his eyelids and eyes from freezing.

Five or six miles up, there was a temperature of sixty-five degrees below zero. Since it has been known that it is *cold* at high altitudes,

the Navy flyer had on the warmest kind of clothing. Heavy woolen underwear, a thickly padded suit of leather, fur-lined gloves, and fleecy moccasins he wore. A fur helmet came down over his face.

The *cold* was not the only enemy to fight. When only a few miles up, the air begins to lose some of its oxygen. *Thin air* makes a person weak and very tired, as would loss of sleep for a number of days. A flyer would become dizzy, senseless, and perhaps would die, were it not for the oxygen which he carries with him in tanks.

Lieutenant Soucek began to take some of this oxygen when only twelve thousand feet up. This he had been advised to do, to save his strength for the hardest part of the flight in the higher altitude.

At a height of a little over seven miles, the hardest part of the flight began. The light oil which helps to make the controls easy to move



had frozen. And it was hard to make the plane do any climbing, she was so near her limit.

Thirty-eight thousand feet, and it seemed that the plane could go no higher!

At this altitude the air is very *light*, too. Up high, the air presses against a person more lightly than down near the surface of the earth. A balloon will burst after it has reached a certain height, because the gas within presses more strongly than the rarer air on the outside. A person will not burst like a balloon, but he will feel very weak and uncomfortable.

Because of the *cold*, frost began to form on the inside of the flyer's goggles. They became so thickly coated that the Lieutenant had to look through the six tiny holes which had been bored through the glass of the goggles, in order to direct the movements of his plane as best he might.

It was hard to see the instruments clearly, and Lieutenant Soucek pushed his goggles up on his

forehead, but not for long. His eyes began to freeze, and became very painful.

For a while, Lieutenant Soucek had to fly with his knees controlling the stick. With his left hand he managed the supercharger which kept his engine at work in air that was so different from that to be found at the surface of the earth. With his right hand he removed his goggles now and then, and held them in such a way as to break the wind, while he took a good view of instruments and controls.

The Lieutenant began to feel very tired, and took as much oxygen as he could, in order to keep from fainting. The light air of the high altitudes was making him weak.

At thirty-nine thousand feet, the plane climbed so very slowly that the Lieutenant thought that the altimeter must surely be frozen.

The Lieutenant took a peek at the ground below. He could see the bend of the Potomac

River at Washington. Except for the fine straight lines of the streets, the city of Washington was just a blur on the ground. The country around was like a patchwork quilt, with small tears made by the rivers.

The Lieutenant thought the view a beautiful and interesting one, but he had no time to enjoy it at length.

“Up—I must try to go still higher,” he thought.

As before, the plane wavered, as if it could not ascend.

The flyer tried to force her. Upward he pointed her nose, and then—downward fell the plane in a spin! He had tried to make her go beyond her ceiling! The climb was over!

At two thousand feet farther down, the Lieutenant was able to get his plane out of the spin. In great circles he spiraled slowly to his home field at the Naval Air Station.

His ears were aching from the greater pres-

sure down below. Aside from this, he felt very well.

His records showed that he had flown higher than the tallest mountain in the world. He had reached an altitude of thirty-nine thousand, one hundred and forty feet, or almost eight miles!

At Anacostia, Washington, D. C., on June 4, 1930, Lieutenant Soucek again fought his way to the upper spaces.

This time he reached a height of forty-three thousand one hundred and sixty-six feet, and won for himself both the American and the World airplane altitude records.

## *A ROUND-TRIP FLIGHT*

FRANK HAWKS already held the record for fast non-stop flying across the United States, when he started on his round-trip flight, in 1929. He had flown from Los Angeles to New York in eighteen hours and eighteen minutes, in February of the same year. And the record had been made in spite of unusually bad flying weather. Almost the entire distance, he had flown at ten thousand feet or higher, in order to keep above the storms.

He started on his round trip, from New York to Los Angeles and return, on June 28th. This time there was good flying weather during the westward part of the flight, except for rain storms in parts of the Middle West.

Hawks reached Los Angeles at eight o'clock in the evening of the same day on which he had



left New York. He had planned to set out again for New York at about midnight, but a leaking carburetor had to be replaced by a new one.

Delayed in this way, it was three-thirty in the early morning of June 29th before he was able to take off again.

The hardest parts of the return trip were the very beginning and the ending. At Los Angeles, a heavy fog made a low ceiling of only six hundred feet. Telegraph reports from the weather observation office at Mt. Lowe brought word that the blanket of mist reached as high as three thousand feet. This meant that with a heavy load of gas, Hawks would have to climb through twenty-four hundred feet of fog, in pitch darkness.

The "*Old Number Five*", Hawks called his plane. It was a Lockheed, which is known to be a good ship for speed and for climbing.

This time, the plane proved to be as good

a climber as ever. Once off the ground, within five minutes the plane had ploughed her way through the fog, and her pilot knew that the worst was over.

For a while after this the weather was very good. Only as the plane neared Columbus, Ohio, late in the afternoon, did the clouds ahead suggest possible trouble.

At this time, the radio, which had been installed as a part of the equipment, came into good use. Just a quick movement to throw the switch, and a turn of the knob, and Hawks was listening in for a weather report given by an expert who knew just what the conditions should be for safe flying.

With the help of his radio, Hawks learned that it would be best to continue his flight to New York high above the banks of fog. He knew, even before he came to them, that there would be frequent holes, and that beneath, there would be a ceiling high enough to make

a forced landing safe in case of motor failure. Beyond the Alleghenies, according to the report, there would be clear skies.

Encouraged by this report, Frank Hawks travelled along without worry.

It was dark before he reached Roosevelt Field, New York, which was to be his landing-place. At that time the extremities of the field were poorly lighted. In making his landing, Frank Hawks ran his plane into the steel-wire fence which forms a boundary on one side of the field. He was not hurt, and his plane received only small injury, but he would rather have ended his flight with a clean-cut landing.

The east-to-west non-stop trip had been made in the record time of eighteen hours, twenty-one minutes and fifty-nine seconds, the west-to-east trip in seventeen hours and thirty-eight minutes—another record for speed.

The round trip to Los Angeles and return had taken only thirty-six hours and forty-

eight minutes, with just seven and a half hours for rest and refueling, at Los Angeles.

And it was the only round-trip non-stop flight that had ever been made across the United States!

## THE LITTLE OLD FLYING-HOTEL

THERE were just two men in this hotel. Their names were Jackson and O'Brien, but they were known as "Red" and "Obie".

Red and Obie wanted to see how long they could remain in the air without returning to the earth. Two other men had been able to stay aloft for ten days.

"It would be great to be able to beat this record," Jackson and O'Brien agreed.

The two men secured the best airplane they could. They chose a light Curtiss-Robertson plane, and named it *The St. Louis Robin*. "A Little Old Flying Hotel" they called it, and this is what it really was.

The men ate their meals in it. They slept in it. For seventeen and a half days they did not leave for even a moment!



*The St. Louis Robin* rose from the field at St. Louis one day in July, 1929. Around and around in the air above the field it circled, as though uncertain what to do next.

“You will have to fly within gliding distance of the St. Louis airfield,” the men had been told. “Only by landing on this field can you receive credit for the flight.”

This is why the men had to remain in one place.

“Good teamwork wins many a game.” The two flyers knew this. One acted as operating pilot, the other as contact pilot, to handle supplies that were sent up from time to time in another plane. He took charge of the receiving of the food, too.

Aluminum containers, three and a half feet long, were lowered into *The St. Louis Robin* by a rope. In the containers were chicken dinners, and other tempting dishes.

“A fellow gets hungry riding around in the

air day after day," one of them said. "He gets hungry for food and hungry for news."

Once this was known, the men were not neglected. Besides the delicious meals, each container held messages from wives and friends. "It will take us three weeks to answer all the kind and helpful expressions," the men announced, after they had been up in the air a while.

The flyers had to take their turns sleeping. For a bed, a mattress had been placed on top of the large gasoline tank.

On this mattress the men had to take their exercises, too. It was only two feet below the top of the plane, but the men could move their arms and legs enough to keep them from getting too stiff for comfort.

When the engine needed tuning, Jackson was the man to walk out on the catwalk and do the work. The catwalk was a six-inch board walk that ran along the outside of the plane,

to within three inches of the whirring propellers. A dangerous walk Jackson had along this board, because the wind always blew so hard. O'Brien, at the controls, had to keep the airplane as steady as he could.

When the men had been in the air a little less than a week, the engine began skipping and shaking. First Jackson went out along the catwalk, and put in new spark-plugs. When this did not help, he had to go out again and work still further on the engine.

The skipping and the shaking stopped, but Jackson had burned his hands. The two men thought, for a while, that their flight might have to be given up before they had made a new record.

Fortunately, this did not have to be. After the repair work had been done, the motor worked along steadily, as if it had more power than ever before. As for Jackson, his burns did not prove serious.

When the ten-day record had been reached, Jackson and O'Brien could see flags and handkerchiefs waving on the field below. Puffs of steam came from whistles, wherever there was a factory. All this cheered the men and gave them new strength. No matter when the landing might be, a new world record had been made.

But the men did not land right away. Eleven days went by, twelve, thirteen, fourteen, fifteen, sixteen, seventeen! Even then, the motor was still roaring along, and the men were not too tired to continue.

It was the man in charge who brought the flight to an end. "We have tried out the engine, and know that it can do wonderful work," the man thought. "A splendid new record has been made."

Jackson and O'Brien would have liked to remain in the air until they had a record of five hundred hours of flying. But they did not. Amid shouts and cheers of thousands of people,

after being in the air seventeen and one-half days, they descended.

In their Little Old Flying Hotel, they had travelled twenty-five thousand miles.

“The men have flown around the world over St. Louis,” some one said.



## A BIRTHDAY TRIP

THE airplane was freshly painted gray, with her name in black on each side of the body.

Colonel Lindbergh was the pilot at the take-off. Mary Pickford had been chosen to perform the christening.

“Where shall I smash the bottle?” she asked.

“Right on the nose,” was the answer.

Miss Pickford did as she had been told.

“I christen you the *City of Los Angeles*, and wish you every happiness and success on this, your birthday,” she said.

With this, the airplane was off, as if anxious to get away before there could be any more hitting of noses.

The trip from Los Angeles eastward towards New York was to be its first,—the opening of a west-to-east passenger route across the coun-

try. A part of the way the *City of Los Angeles* was to carry passengers—until nightfall. Then a railroad train would pick up the travelers. When day came again, another airplane would be ready to take the passengers on their way. With the help of still another train, the distance to New York would be covered.

Some of the passengers were not used to the noisy motors. Nor did they like the vibration any too well. They were only too willing to put into their ears some of the cotton passed around by a courier.

As they peeked through the big glass windows, and saw how high up above the earth they were, perhaps they wondered if they would ever reach New York in safety.

Others enjoyed every moment of the trip. They liked to see the houses far below. The automobiles were like toys, and the people as tiny as ants.

A little farther to the east were the beauti-

ful mountains and valleys, the desert region, and rivers flowing between wooded banks. Great squares of farmland made the country look like a huge green patchwork quilt.

At times, when the airplane flew low, the passengers laughed to see the sheep scamper in this direction and that, as if to get away from the noisy enemy. Chickens fluttered here and there, flew over fences and scurried away as though a giant hawk were after them.

Every once in a while the plane would strike what is commonly known as an air pocket. The ship would go into a dive, and each of the passengers would make a grab for the aluminum table in front of him.

“Are we falling?” Some of the new passengers thought that the ship would plunge downward with a crash, at the end of each dive.

A boy was selling coffee just as the ship hit one air pocket. The boy had the pot of coffee, bottles of milk, sugar and spoons in a basket

over one arm. As the airplane made the dive, a bottle of milk bounced out of the boy's basket and fell into the lap of the nearest passenger!

Later, there was a heavy rain-storm.

"Now, perhaps our end has come!" some of the first-time-in-the-air passengers may have thought.

But their end had not come. Instead, with no traffic to hinder, the airplane moved forward speedily, and was able to get ahead of the storm.

Throughout the whole distance, there were no accidents on either planes or railroad trains. Most of the time the passengers enjoyed smooth riding. Some read magazines or papers, others wrote letters, played cards, or sent messages by radio.

When New York was reached, just two days had passed since the passengers had started on their journey. This was sooner than if they had taken a railroad train or boat all of the way.

There was much less dust too, and there were no cinders to annoy them.

The *City of Los Angeles* started this west-to-east Air-Railway service in July, 1929. There were other passenger airplanes in the United States and in Europe at that time. There are many others now. But perhaps not one ever made such an important trip on her *birthday*.



## THE GRAF ZEPPELIN

A BOY stood on the top of an automobile at Lakehurst, New Jersey.

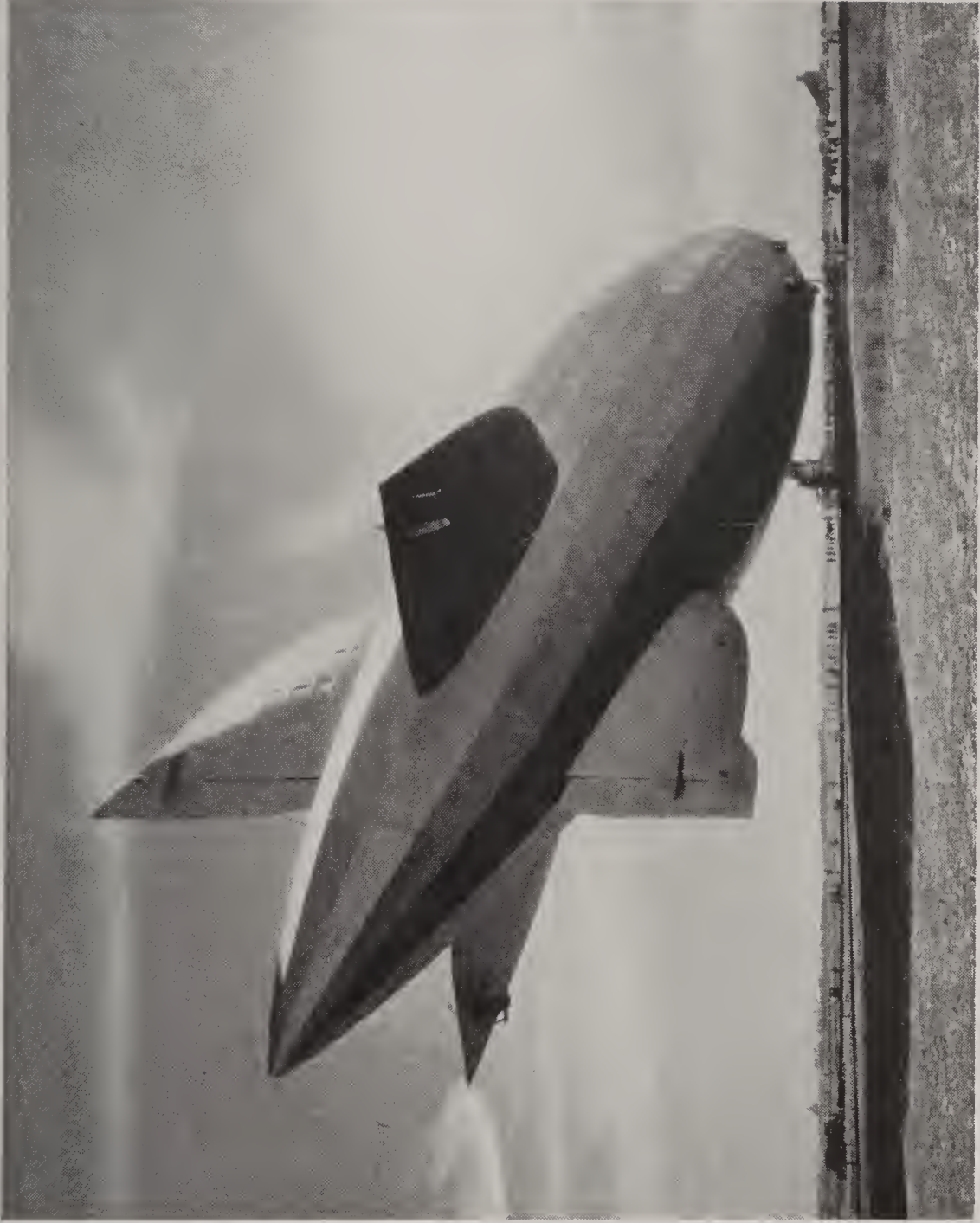
“Here she comes!” The boy danced about and waved his arms excitedly.

*Rip!* One leg went through the top of the automobile, and there was a pinwheel of legs and arms. But the boy kept on pointing skyward.

“Here she comes!” The crowd of people around about took up the cry.

And there she was! The largest aircraft in the world, the *Graf Zeppelin*, had returned from her trip around the world.

On August 8th, 1929, the giant aircraft had left Lakehurst. Over the Atlantic Ocean she had travelled, and on to Friedrichshafen, Germany. Four days later, the great dirigible had



*Photograph by Ewing Galloway.*

THE *GRAF ZEPPELIN* AT LOS ANGELES.  
Leaving California on its Round-the-World Flight.



set out again, across Russia and cold, lonesome Siberia, to Tokio, Japan. Four days for refueling and for going over the machinery, and the party was off once more, to cross the Pacific Ocean and the United States.

On the way, violent winds tore and clawed. At one time, the great ship jumped up and down like a stiff-legged bucking broncho, the winds were so rough. And there were the usual fogs and storms.

But the *Graf Zeppelin* had kept on, at an average speed of fifty miles an hour, and in twenty-one days, seven hours and twenty-six minutes, had completed her trip.

More than three hundred sailors had been chosen to help the *Graf Zeppelin* get into the hangar upon her landing at Lakehurst. Here she was to stay for a day or two, before returning to Germany.

The sailors had to get hold of the long ropes which had been let down from the giant dirigi-

ble. They were busy with this work, when a great mass of water came down and gave them a merry ducking.

The men laughed, and shook themselves like spaniels just out of a puddle.

“It is the water ballast,” one of the ground officers said.

When the *Graf Zeppelin* had been brought to rest, those who had been aboard climbed down the landing ladder. In all, sixty-one persons had been carried by the *Graf Zeppelin* on the greater part of the trip—twenty of them passengers.

Of the latter, one was a woman, Lady Drummond Hay, who had written various accounts of the trip along the way. She seemed greatly pleased to have been able to be a member of such an important expedition.

“I am the happiest woman in the world,” she said.

Dr. Eckener, the *Graf Zeppelin's* German



master, seemed just as well pleased. He fairly beamed with smiles, as he shook hands with the Naval officers.

“*Gott sei Dank!* Thank God!” were his words.

## RICHARD BYRD FLIES TO THE SOUTH POLE

A BLIZZARD.

Fog.

Head winds.

A bit of dirt in the fuel lines.

A flaw in a piece of steel.

Any one of these might have kept Richard Byrd from making a successful flight to the South Pole, from his base at Little America, eight hundred miles away.

Richard Byrd knew about all the dangers, and prepared his Ford monoplane as well as he could. "The *Floyd Bennett* (as she was called) was more carefully groomed than any thoroughbred horse going into a race," Richard Byrd said.

One great danger the men discussed often. This was the "Hump", or part of the polar mountain range over which the plane would have to pass.

The *Floyd Bennett*, with her three Wright Whirlwind motors, made an excellent take-off at 3:29 o'clock on the afternoon of November 28, 1929.

Richard Byrd was the navigator. With him were three other men, One, called June, attended to the motion-picture camera, the radio, and the gas-tank valves, besides relieving the pilot now and then. Balchen was the pilot. From Richard Byrd's table, with navigation charts spread out upon it, a trolley ran to Balchen's control cabin. The navigator sent messages to the pilot over the trolley. Often, when Balchen received one of these messages, he would turn and smile. This meant that he understood.

McKinley, the camera-man, had all he could

do to take pictures of important places between Little America and the South Pole.

Glaciers, mountains covered with snow, plains glistening in the sunlight—these and many other beautiful pictures in black and white the men saw as they flew along.

And as they travelled, they kept thinking about the “Hump”. Would they be able to get over it?

At last the dreaded place came into view, and the flyers could see that they had several passes from which to choose. Richard Byrd went forward and stood behind the pilot so that the two could figure it out together.

The highest point of what was known as the Axel Heiberg Pass was ten thousand, five hundred feet. The explorer, Amundsen, had reported this. On either side of the pass were towering peaks, reaching much higher than the *Floyd Bennett* could ever climb with her heavy load.

Another pass, which was uncharted, seemed to be wider, and not quite so high. This one Richard Byrd and his pilot chose.

And then the climb began. June filled the main tank with gasoline, and dropped the empty tins overboard. Each tin weighed one pound, and every pound taken from the plane's load made climbing easier.

When ninety-six hundred feet up, the *Floyd Bennett* slackened her speed. It seemed that she was as high as she could go. The nose of the plane would move up, then slide down, move up, and fall off again.

The pass was narrow. There was no room in which to turn around. The plane would have to go ahead, or go down.

There was but one thing to do. The plane's load would have to be lightened, to make climbing easier.

Gasoline or food—which should be thrown overboard? Richard Byrd decided on giving



up a part of the food, and the order was given to do this.

McKinley had already hauled one of the one hundred and twenty-five pound sacks to the trap-door. As soon as he received the signal, the door was opened, and down upon the white glacier below fell the brown bag of food.

The *Floyd Bennett* did better with even this much of her load gone.

But it wasn't help enough. Another one hundred and twenty-five pound bag had to be given up. Two hundred and fifty pounds of food, this made in all—enough to keep four men a whole month!

But losing the food saved the ship. The plane shot upward! Then it began to climb so much better that the "Hump" was crossed with five hundred feet to spare!

With the South Pole straight ahead, less than three hundred miles away, to reach it was likely to be an easy matter.

At 1:14 A.M., November 29th, Greenwich Civil Time, the South Pole was reached. Eleven thousand feet high the *Floyd Bennett* was flying, about fourteen hundred feet above the snow-covered plateau.

Richard Byrd opened the trap-door, and dropped over the Pole a small flag weighted with a stone. The stone had come from the grave of his friend, Floyd Bennett, who had flown with him to the North Pole.

The radio operator, June, sent this message to Little America, to be relayed to New York:

“My calculations show that we have reached the vicinity of the South Pole. Flying high for a survey. Byrd.”

As for the South Pole—it was a white, snowy spot—a very quiet one, in the center of a plain that seemed to have no limits.

There were no mountains in sight, but clouds on the eastern horizon caused the flyers to race for the mountain passes. It had been hard

enough to get through in clear weather. In a storm it would be almost impossible.

A wind astern helped the *Floyd Bennett* to win the race. Ahead of the storm she hurried along, over the "Hump" and on to the gasoline and food cache, where a landing had been planned.

An hour later, the plane was off on her last lap. With the help of the sun compass and the drift indicator, Richard Byrd was able to direct the plane's flight to a safe landing at Little America. There, at 10:08 A.M., on November 29th, the historic flight ended.

Richard Byrd then had the honor of being the only man who had ever flown over both the North and South Poles!

## *FRANK HAWKS SEES AMERICA IN HIS GLIDER*

FRANK HAWKS knew that his round-trip flight across the United States had helped to interest people in aviation.

What should he do next?

A happy thought came. Why not ride across the country in a glider? With an airplane to furnish the power and tow the smaller machine, this could be done. Those unable to afford airplanes might become interested in learning to fly with gliders. This might lead to their coming to fly with power, later. "For them, it would be coming into Aviation by the back door," Frank Hawks explained.

The Texaco Company could see the good points of such a flight, and construction of a special glider was begun. For the first time,

the glider was made with an enclosed cabin. An enclosed hood gave added protection. "Facing the wind and the sun with no enclosure would be anything but comfortable," Frank Hawks had argued. A five-hundred-foot tow-line was made to connect the two ships. Inside the towing-cable was a telephone wire, with the aid of which the pilot of the plane might speak with the pilot of the glider. The telephone cord was made with a plug that would pull out whenever the plane should cut loose from the glider. The pilot of the tow-ship could also disconnect his end of the cable whenever he wished to do so. Special instruments, brakes, and other conveniences made the new glider better than any that had been made up to that time.

The glider, christened the *Texaco Eaglet*, was built during the winter of 1929–30. On the 30th of March, 1930, all was ready for the flight.



“Duke” Jernigin was to pilot the tow-ship, which was a Waco biplane with a Whirlwind motor. Wallace Franklin, one of the builders of the plane, was to ride with him. It was to be one of Wallace Franklin’s duties to wind up the cable with a reel whenever the glider pilot descended. And Frank Hawks, it had been planned, should descend at twenty-one different cities along the route, to give exhibitions of gliding and soaring.

The air-train left Lindbergh Field, San Diego, on a Sunday. By the following Sunday, it was hoped, Van Cortlandt Park, New York, would be reached.

A large crowd watched the flyers disappear in the distance, at the beginning of their twenty-eight hundred mile journey.

The take-off was smooth enough, but there was plenty of roughness when the flyers were farther on their way. To Yuma and Phoenix for fuel, and to Tucson for the night, were the

plans. En route to these places there was rough travelling from the beginning. And the nearer the flyers got to Tucson, the worse the conditions became, But, without mishap, a landing was made, within sight of ten thousand persons. Frank Hawks and his companions were very tired because of the rough flying that they had just been through, but thought that the worst was over. In this, they were mistaken.

The next morning, when barely off the ground, the air-train was struck by a sharp slap of wind. The tow-ship was thrown one way, the *Eaglet* another, and the tow-line was snapped in two. A whole day had to be spent in repairing the damage!

Off again, to meet more rough weather. The men hoped for smooth flying by the time El Paso should have been reached, but it was not to be. Instead, all flying had been called off at that place, and the pilots of the air-train had all they could do to get down in safety.

## FRANK HAWKS IN HIS GLIDER 239

Leaving El Paso, there was time to be made up because of the delay in repairing the cable at Tucson. The tow-plane, with its glider attached, managed to fly seven hundred and ten miles in one day.

Then, with calm weather at last, came Wichita Falls, Oklahoma City, Tulsa, Springfield (Mo.), East St. Louis, Terre Haute, Indianapolis, Columbus, and Cleveland. Buffalo was reached on the eighth and last day.

It had been planned to make just one short halt between Buffalo and New York City, on this last day of flying. The stop was to have been at Elmira, but rough weather was at hand and plans had to be changed. Such a violent wind was blowing that it was thought best to stop at Syracuse and at Albany, instead.

At Syracuse came the most dangerous take-off of the entire trip. Just off the ground, rising currents of air were encountered. By spiraling, and keeping in these up-currents, the aviator

climbed two or three thousand feet at a time. The crowd was watching eagerly below, and if there had been time, Frank Hawks could have entertained them for hours by soaring around over their heads.

At Albany, the gale-like winds were worse than ever. A dust storm blew across the field, and all flying had been postponed.

But the flyers had to keep on, in order to reach New York on schedule time. Even at a very early hour, a large crowd was awaiting the arrival of the unique air-train.

After taking off at Albany, there was more hard flying. At one time the Waco ship in front, was lifted up and thrown down by a sudden violent tearing and twisting of the wind, and the pilot had to use all the skill at his command, in order to pull his ship through in safety.

In spite of all the lurches and plunges through the bumpy air, the train got away at



last, and with the leaving of the city of Albany, the strong winds were also left behind.

The rest of the trip was made under fairly good flying conditions, and at Van Cortlandt Park, a gentle landing was made.

Best of all, in spite of the roughness of the trip, the goal had been reached on scheduled time. Frank Hawks had seen America by glider, as he had planned. He had taken only as much time as he had set aside for the purpose. Just eight days had passed since the take-off. Of this there had been forty-four hours and ten minutes of real flying, thirty-five hours in tow of the Waco, and the rest of the time in soaring above towns and cities.

To-day, the *Eaglet* glider rests in the Smithsonian Institute at Washington, D. C., with other well-known ships—among these the *Spirit of St. Louis*.



## *A SPEED RECORD*

“IF YOU will provide the plane, I should like to try to break the record which the Lindberghs have just made,” Frank Hawks told the officials of the Texaco Company, of whose Aviation Department he was in charge.

On Easter Sunday, May 20, 1930, Mr. and Mrs. Lindbergh had flown from Los Angeles to New York. With one stop for fuel, they covered the distance in fourteen hours, forty-five minutes and thirty-two seconds.

Up to that time, Frank Hawks had held the record for fastest flying from west to east across the United States.

The officials of the Texaco Company had learned that money put into planes driven by Frank Hawks was money well spent for adver-

tising. They were not slow to give their consent to the new venture.

A new plane was built—the *Texaco 13*, or *Mystery Ship*, as it was called,—a red and white monoplane with a Wright Whirlwind motor.

When the plane was completed, Hawks flew in it from New York to Los Angeles, since the flight would have to be a west-to-east one. While on this trip, he was able to try out the new motor, and study ways and means of cutting down on time spent in the air.

Five stops were made for fuel, but Frank Hawks, by watching his gasoline meter very closely, found that it would be possible to get along with only three fuel stops.

From the Glendale Airport, Los Angeles, the *Mystery Ship* took off in the moonlight, very early on the morning of August 13, 1930—at 6:16:27 A.M., New York time.

As she passed between mountains which rise

abruptly, just out of Glendale, the moon lighted up the way. As the speedy pilot directed her across the Mojave Desert, the moon sank behind the mountains in back of the plane.

Over the National Forests of Arizona, the sky began to brighten with the coming of dawn. Near Flagstaff, Arizona, the sun could be seen rising above the ridges ahead.

One of the three stops for fuel was made at Albuquerque, New Mexico, where Captain Hawks remained in the cockpit of his plane, and ate one of the sandwiches which his mother had put up for him in Los Angeles.

On again, at a height of eight to ten thousand feet, came the fastest flying of the trip, with the help of a thirty-four-mile tail wind. The Arizona desert, the tip of Texas, the Northern Oklahoma wheat lands and ranges were left behind, and into the second refueling stop of Wichita, Kansas, Captain Hawks brought his plane.

With only fifteen minutes' delay, the *Mystery Ship* was off again.

Rains, near St. Louis, caused the flyer to direct his plane upward above the storm to secure a clearer course.

Then, without further trouble, Indianapolis, the third fueling stop, was made, shortly after three o'clock in the afternoon.

Captain Hawks was beginning to be very hungry, but decided to lose no time in eating, since he hoped to be able to have dinner in New York that evening.

Against a contrary wind the rest of the way, with smoke and haze shutting off a clear view of the ground, Captain Hawks raced along at a speed ranging between two hundred and ten miles and two hundred and sixty miles an hour.

North of Dayton and Columbus, past the hilly Pennsylvania section, over the dark, smoky Pittsburgh area, above the green firs and

forests farther east, then across the Delaware, the *Texaco 13* shot forward.

By this time, the bluish coloring of the eastern horizon promised that the Atlantic was near at hand, and so it proved to be.

At 6:41 P.M., when the *Texaco 13* reached her goal, a crowd had gathered to give welcome.

Mrs. Hawks climbed upon one of the wings of the plane, to be the first to greet her husband. Members of the Mayor's Committee were on hand, as were the President and other officials of the Texaco Company. The around-the-world flyer, Captain Eric Nelson, and other well-known people were present.

Captain Hawks smiled as he climbed out of his monoplane.

"When do we eat?" he asked.

As he drove away to the Ambassador Hotel in one of the Mayor's official cars, reports went out to all parts of the country about the unusual record for speed that had just been made. In



his *Mystery Ship*, Frank Hawks had covered the two thousand, five hundred and ten miles from Los Angeles to New York in twelve hours, twenty-five minutes, and three seconds!

## IN A SECOND-HAND BUS

THE record of "The Little Old Flying Hotel" was a hard one to beat, but in what they called their "Second-Hand Bus", John and Kenneth Hunter were able to remain in the air still longer. Five hundred and fifty-three hours, forty-six minutes and thirty seconds, or a little over twenty-three days, was the new record.

Up into the air they went on June 11, 1930, and remained aloft until July 4th!

What was called the "Bus" was a Stinson-Detroiter monoplane, which had already flown seventy thousand miles. The Hunter brothers named it the *City of Chicago*, and added another forty-one thousand, four hundred and seventy-five miles, in their record-breaking endurance flight.

The brothers came from Sparta, Illinois. With them came their mother and sister, to do

the cooking, their brothers Walter and Albert, to operate the refueling plane. The wife of one of the brothers was in the party, as were a number of friends from the home town.

While in the air, the men did not suffer for want of food. The mother and sister sent up fried chicken, frankfurters, hard-boiled eggs, and assorted "goodies" which they had prepared for the flyers at the airport below.

But the men were bearded, oil-stained, and dirty when they came down. Their legs were stiff from being in cramped quarters for so long a time. They were haggard from lack of sleep, too, having had only four or five hours' rest at a time. During the last two or three days, so many sightseers had flown about them in airplanes that even their few hours of sleep had been broken.

"It took us a week to get used to living in the air," one of the brothers said. "After that we felt fine, except that we felt the need of sleep."

## PICCARD'S PLUNGE

EIGHT or nine miles above the earth is a cold, windless region, where the moon appears as bright in the daytime as when seen from the earth in the middle of the night. The stars shine by day and clouds never form. It is a great ocean of blue, and is known as the stratosphere.

Into this great ocean plunged an aluminum ball attached to a huge balloon, one day in May, 1931.

In the seven-foot, oxygen-filled ball were a Swiss scientist, Professor August Piccard, and his assistant, Charles Kipfer. Fifty-two thousand feet, or more than ten miles up, they were able to go before a descent had to be made.

At the highest levels, the men found the temperature to be  $148^{\circ}$  below zero!

As for views, there was nothing much to be seen, apart from blue space.

On the way up, the aluminum ball sprang a leak, which the men plugged with cotton waste and a sort of chemical jelly.

Just before the balloon started to come down, a valve jammed, and gas could not be released for the descent. The men had a double supply of oxygen, or they would have lost their lives. Just two hours more, and there would have been a sad ending to the flight.

As it was, they were in the air eighteen hours, which was eleven hours longer than they had planned.

Coming down, the men had to be careful not to release too much gas, so that the aluminum ball would not drop like a stone.

Slowly the balloon descended over the snow-covered Alps mountains. Fortunately, as they sank farther, the gondola touched ground on the soft snowy covering of a flat ice field.



One hundred thousand feet, next time," Piccard's assistant, Kipfer, says he will try to go, as soon as a special kind of balloon-bag can be made.

*POST AND GATTY AROUND  
THE WORLD*

Only eight days, fifteen hours, and fifty-one minutes, it took Wiley Post and Harold Gatty to circle the globe.

With very little sleep — only fifteen hours for the entire journey, with almost no delay for weather reports, the “two young men in a hurry” raced around the world!

A quick take-off from Roosevelt Field, New York, scarcely more than a turn-around at Harbor Grace, Newfoundland, then over the Atlantic Ocean, the aviators travelled. They had to fight their way through fog and rain, but their time for the ocean crossing was the shortest ever made by any flyers covering the same distance — only a little more than sixteen hours.

“Hello, England, we’ve done it!” Gatty

said, when the machine had come to a standstill at Chester.

A short delay, and the two were off again, this time to Berlin.

A few hours of sleep at this city, a bath and a breakfast of coffee and rolls, ham and eggs, then away again.

“We must move on while flying conditions are so good,” one of the flyers said.

The Russian steppes and the Siberian wilderness were spanned in a smooth, swift flight. One daring jump took the men to Moscow, another to Novo-Sibersk, still another to Irkutsk.

Here they had a brief rest, inspected their plane, and left abruptly. Without giving notice, they climbed into their machine, waved good-bye, and hurried off in a cloud of dust!

Beyond Irkutsk, over some of the wildest country in the world, to Blagoveschensk, went the flyers.

At this place they had their first mishap,

when their plane, in landing, became stuck in a mud-hole. Fourteen and a half hours had to be used up in getting the plane out of the mud, with horses and a tractor!

Khabarovsk was the next stop; then Nome, Alaska, over the desolate north and the Bering Sea. Fogs and storms did what they could to delay the men. It rained so hard, a part of the time, that Wiley Post, the pilot, could see nothing beyond the glass in front of him for hours.

But Alaska was reached in safety, and a landing was made at Solomon, a few miles to the east of Nome. There was a short rest here, and a hasty meal of fried chicken.

Gatty was bruised in the chest and in the arm when struck by one of the propellers, while trying to crank the motor, but he would not delay.

On an attempted take-off the plane nosed over, because of the rough ground. When it stopped, one of the propellers was found to be

bent. Post pounded it into shape with a hammer and a wrench, and the flyers were off!

Only a short rest again at Fairbanks, the next stop. At two-thirty in the morning, the men were called.

Post yawned when awakened at this early hour. "It's a hard life," he said, but hurried to get out to the field.

At Edmonton, Alberta, Post was so tired that he fell asleep and rolled off his chair, while waiting for the supper of omelet and toast, which he and Gatty had ordered.

After the meal only a few hours' sleep was allowed, but with a shave and a bath, the men were refreshed enough to be on their way again.

"It's downhill now. Nothing to it," Gatty said.

"It's only 'duck soup' from now on," Post added. "But we'll be mighty glad to get home after this grind."



A twenty-four hour rain had left the flying field at Edmonton in such a soggy condition that a take-off had to be made from one of the town's concrete streets.

Out of Edmonton, flying conditions were not very good, but the racing monoplane hurried along in spite of rain and mist.

A delay of only forty-five minutes at Cleveland, Ohio, and the last lap of the journey had come.

Meanwhile, the city of New York was doing its part in the way of hurrying. Preparations were being made for receiving the flyers with great honor, while the wives were rushing eastward, one from California and the other from Oklahoma, to take part in the welcoming celebration.

On the evening of July 1, 1931, at ten o'clock, New York daylight-saving time, Post and Gatty climbed out of their now famous monoplane, the *Winnie Mae*.

They were tired, but happy about their success.

Fifteen thousand, four hundred and seventy-four miles in eight days, fifteen hours and fifty-one minutes!

“Greatest flight in the history of the world!” many agreed.

## A NON-STOP FLIGHT, NEW YORK TO TURKEY

RUSSELL BOARDMAN and John Polando smiled broadly and shook their own hands over their heads when they left their plane at Istanbul, Turkey, on July 30, 1931.

In their monoplane, *Cape Cod*, they had made a non-stop flight of five thousand miles from New York City — the longest that had ever been made in an airplane.

“The hardest part of the trip was over the Alps,” one of the men said. “And while crossing the Atlantic, only once could we see the water below. This was at Newfoundland. Fogs hid the ocean from view all the rest of the time.”

“We took turns piloting,” the flyers explained. “While one was at the controls, the

other slept for short periods of about half an hour at a time.”

“As for the forty-nine hours that we spent in the air — we could have made better time, had it not been for the fogs over France.”

## A "FLYING ENGINE"

"It is a flying engine." This is what experts had to say when they examined the Laird bi-plane used by Major James H. Doolittle in his record-breaking United States transcontinental flight, September 4, 1931.

The special super-charged and geared Wasp Jr. engine could develop close to six hundred horse power. The propeller was geared to permit higher engine speed and the use of a larger air-screw. The plane was streamlined to the limit of modern knowledge of aërodynamics.

The cockpit was so small that Major Doolittle, although only five feet four inches in height, could hardly get into it. For a seat, the flyer had only his parachute pack, which rested on the floorboards.

In this specially made plane, Major Doo-



little raced from Burbank, California, to Newark, New Jersey, with a bullet-like speed, averaging just under four miles a minute. Eleven hours, sixteen minutes, and ten seconds were required for the cross-country flight.

From the time the checkered flag was dropped at Burbank, California, at 5:35 A.M., eastern daylight time, there were no seconds lost.

A run of only four hundred feet was needed for a take-off. Almost vertically the plane rose, to a height of five thousand feet, then at a lessened angle of climb, started to gather speed for the San Bernardino Pass.

At a height of eleven thousand feet the climb ended.

The plane was levelled off and hurried along, one thousand feet above mountain-peaks that seemed to be rushing past as telephone poles rush by car windows.

Once the mountains were cleared, Major

Doolittle began to direct his flight to lower altitudes. He came down only one hundred feet a minute, and at the same time raced forward four miles. He followed no regular air-lane. The shortest route to the first stopping place was chosen, and the engine throttle opened wide.

At Albuquerque, New Mexico, there was a seven-minute delay for refueling. The flyer drank a glass of water, then raced on again to the next stop at Kansas City, Missouri.

On this leg the plane averaged two hundred and forty miles an hour, the fastest average speed of the cross-country journey. The air made a screaming noise, the engine roared — a noisy flight but a sure one. Kansas City was reached in safety and in record-breaking time.

Only a few minutes' delay again, and the plane was off—this time headed for Cleveland, Ohio.

In all, seven planes were racing to Cleveland

on that day, as part of an Air Derby. The speedy flyer reached the city far ahead of his competitors, and did not know where they were.

At Cleveland, inclement weather made landing difficult. Major Doolittle had to fight his way to the airport, and mud flew in all directions from the plane on the runway.

Major Doolittle had to pause long enough at this stopping-place to report on having won the Air Derby, for which a prize of seventy-five hundred dollars had been offered. While mechanics hastily refueled his plane, the flyer greeted Mrs. Doolittle and his two sons, James, ten, and John, nine, who had come from St. Louis to watch him win the race.

Then away he went again, this time to New York for the transcontinental record.

With difficulty, Major Doolittle left the slippery field at Cleveland. On the way to New York much bad weather was encountered.

A blackened sky ahead first gave warning of

trouble to come. In thunderstorms that followed Major Doolittle had to fly by instruments while he crouched behind the cowling of the cockpit for protection from the stinging lash of the pelting rain.

In spite of this, the plane shot forward at its high rate of speed, up or down, wherever flying conditions were best.

Over the Alleghenies, there were times when the speedy airman could hardly see where the hills were, but the direct route was followed.

After reaching a place thirty miles west of Newark, the thunder showers were left behind.

In a diving, wide circle, the plane tore around the edge of the Newark Airport and touched ground at a speed of two hundred and seventy-five miles an hour. The plane was spattered with mud and stained with soot. The flyer himself was mud-stained and his white linen knickers were torn from hasty climbs in and out of the small cockpit.



Major Doolittle was dazed from the carbon-monoxide gas fumes which had seeped into his cockpit enclosure from the open exhaust of the nine-cylinder engine in front. But he did not wait long. A last hurried refueling, and he was off again to break his own record in a return flight to the Air Derby at Cleveland.

Two thousand, eight hundred and eighty-two miles had been covered in the day's flight which came to an end at the city of Cleveland. Two prizes, amounting to ten thousand dollars had been won. A new transcontinental record had been made.

As for the plane, so like a "racing engine,"—it was still in good condition, except for a few minor injuries caused by the rushing wind.

Major Doolittle made very little of his feat in speaking over the radio, later.

"The flight was so very uneventful, it was almost monotonous," he said.



## THE PACIFIC OCEAN CROSSED IN NON-STOP FLIGHT

SEVERAL flyers had crossed the Pacific Ocean in two or more hops. The *Graf Zeppelin* had made the trip from Tokyo to Los Angeles without a stop. But the Pacific Ocean had never been spanned in non-stop flight by airplane, until Clyde Pangborn and Hugh Herndon made their crossing in October, 1931.

The airmen left Samushira Beach, Japan at 5:10 P.M., Eastern Standard Time, Saturday, October 3rd, and landed at Wenatchee, Washington, at 10:14 A.M., Eastern Standard Time, October 5th.

In order to make better mileage and speed, the landing-gear of the plane had been dropped shortly after leaving Japan. Just before gliding to the ground at Wenatchee, one hundred

gallons of gasoline were thrown out. This was done to prevent possible fire upon landing without the usual gear.

The plane jolted along the ground in a cloud of dust, tipped over on her nose, and then settled back. The propeller was damaged but the flyers were able to alight unhurt, except that Herndon had been cut over his left eye by the damaged propeller.

The two men were in their woolen socks when they came out of their plane. "We have been in Japan so long, we are still going barefooted," Pangborn explained laughingly.

A representative of the Japanese newspaper, *Asahi*, stood by with a check for twenty-five thousand dollars, which had been offered as a reward to the first flyer who should cross the Pacific Ocean in a non-stop flight from Tokyo.

For three months the newspaper representative had been waiting in Washington to make the award.

“Very glad to see you, boys,” he said.

Asked why they had not continued on their way to Salt Lake City to better the five thousand mile long distance record of Polando and Boardman, the aviators explained that heavy fog and a barograph out of repair had caused them to turn back when they were almost as far as Spokane, Washington.

According to the airmen, the greatest thrill of their flight of forty-five hundred and sixty-five miles came when the plane was about three thousand miles from the Japan coast. At this point the engine came to a full stop!

“My heart came up into my mouth, that time,” Herndon said in telling of the experience.

An empty gas tank had caused the trouble. The flyers worked as quickly as they could to supply the motor with the needed fuel, but two thousand feet of altitude were lost before the work was finished.

Ice on the wings made the plane lopy at the flat end of the Alaskan Gulf, but the strong engine carried the extra load without mishap, although at diminished speed.

Good weather favored the flyers almost all the way. Toward the end of the trip, thick weather and fogs were encountered, but only once was their plane endangered because of storms. This was over western Washington, during the last hours of the flight.

The successful non-stop Pacific crossing made by Clyde Pangborn and Hugh Herndon had been preceded by a number of unfortunate mishaps.

In trying to better the around-the-world record of Post and Gatty, they had been forced to land at Khabarovsk, Siberia because of a damaged wing.

A flight from Tokyo to Seattle was planned next, but their plane was seized by the Japanese Government and the flyers were arrested

for flying over a fortified area and taking photographs without permit.

Then came the Pacific Ocean flight. In spanning the long stretch of this great body of water, Clyde Pangborn and Hugh Herndon succeeded in accomplishing a feat which had balked the efforts of many other aviators.



## THE AKRON

LARGEST, fastest, strongest, safest, and most comfortable:

All this may be said of the *ZRS-4*, the new rigid dirigible balloon which was built in the plant of the Goodyear Zeppelin Corporation at Akron, Ohio, and which became the *Akron* of the United States Navy on October 27, 1931.

Seven hundred and eighty-five feet long, with a maximum diameter of one hundred and thirty-two and nine-tenths feet, and a gas capacity of six and a half million cubic feet, she is the largest air vessel ever built. Two hundred and seven persons have already been carried by her at one time, and eight hundred may be carried. The great Dornier seaplane, *DO-X*, has thus been put into second place with her total of one hundred and sixty-nine



*Photograph by Keystone.*

**THE AKRON OVER LAKEHURST.**



persons taken into the air over Lake Constance, Switzerland.

Driven by eight engines, the *Akron* has a maximum speed of eighty-four miles an hour, which is greater than that of any other lighter-than-air ship, and faster than any large surface vessel can travel. She can cruise nine thousand one hundred and eighty miles without refueling.

As for strength, a storm such as destroyed the *Shenandoah* would have to be more than three times as severe to make wreckage of the *Akron*. Step by step, throughout her construction, all parts have been tried out. Girders, joints, fittings, and rudders have been made with the greatest care. During the tests the ship was loaded with tons of weight. It seemed like an attempt to break her back. In the air, she was made to dive and climb at speeds thought to be dangerous in former practice. An ordinary office elevator ascends at about two hundred



and forty feet a minute. According to specifications, the *Akron* had to be made to climb twelve hundred feet in a minute, and she can actually climb four thousand feet in that short time.

For safety, non-inflammable helium has been used. The twelve bags which contain the gas are enclosed in a system of wire and cord netting. They have a tightly drawn outer covering of cotton cloth coated with several thicknesses of acetate "dope" to smooth out the contour of the hull and to serve as protection from the weather.

No smoking is allowed on the *Akron*. A fire-proof galley makes safe the area containing the gas cook-stove. As for a breakdown, the strongly made parts of the vessel make this unlikely. For keeping in touch with other ships and places, the most powerful radio used by lighter-than-air vessels has been installed.

Hot-air heat makes living quarters comfortable. Electricity is used for lighting, for a small part of the cooking, for telephones, fans and



other uses. A gas stove aids in the preparation of well-cooked meals. As for the ride itself, this is as smooth as by any means of transportation, and even with the eight engines travel is quieter than on a railroad train.

Shortly after being admitted to the Navy, the *Akron* made a five-hundred-mile trip along the Atlantic seaboard. Millions of people in New York City watched the giant air cruiser sail majestically up the Hudson as far as the new George Washington bridge, then around to the south again and over the tall skyscrapers. With her new silver coat she was "Silver Queen" to many on that day. "Air Giant" was another name given her, for with the *Los Angeles* as an escort, her greater size could be plainly seen.

"How could she protect herself in time of war?" was asked by many. Those who had read the details of the *Akron's* construction were able to answer:

"Emplacements have been made for ma-

chine-guns which will protect the great dirigible from all angles. Amidships there is a hangar to hold five wasp-like airplanes to be used as scouts or flying guns. Experiments with the *Los Angeles* have already proved that a dirigible can launch and pick up planes while in flight. The fighting planes, made especially for speed and lightness, will be on the lookout for possible danger.

“With protection such as the *Akron* has, any vessel that can scout ocean waters at the rate of a thousand miles a day, for nearly ten days, without refueling, is an important addition to any fleet.”

## *THE FUTURE*

THESE brief historical accounts have to do with Aviation up to the present time. But the work is not yet over. New records are being made. There is constant advance in the science of exploring the upper air and safely traversing the spaces of the sky.

What development the future will bring cannot be foretold, but there is sufficient glory in what has already been done to entitle to permanent honor those who have performed what has been set forth.

With the momentum gained by a past of such rapid and weighty achievement, there is every reason to believe that great power for advancement will come to the world through the flying men who shall be the AIR TRAVELERS of the future.

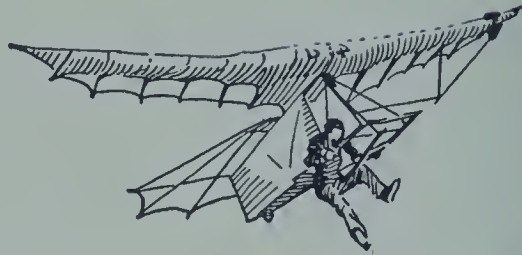
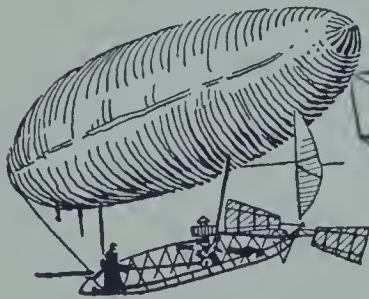
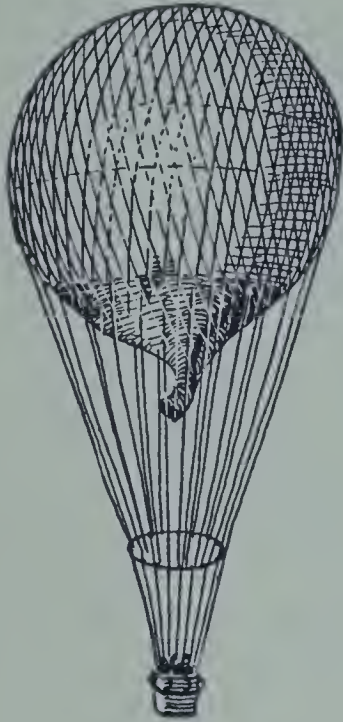




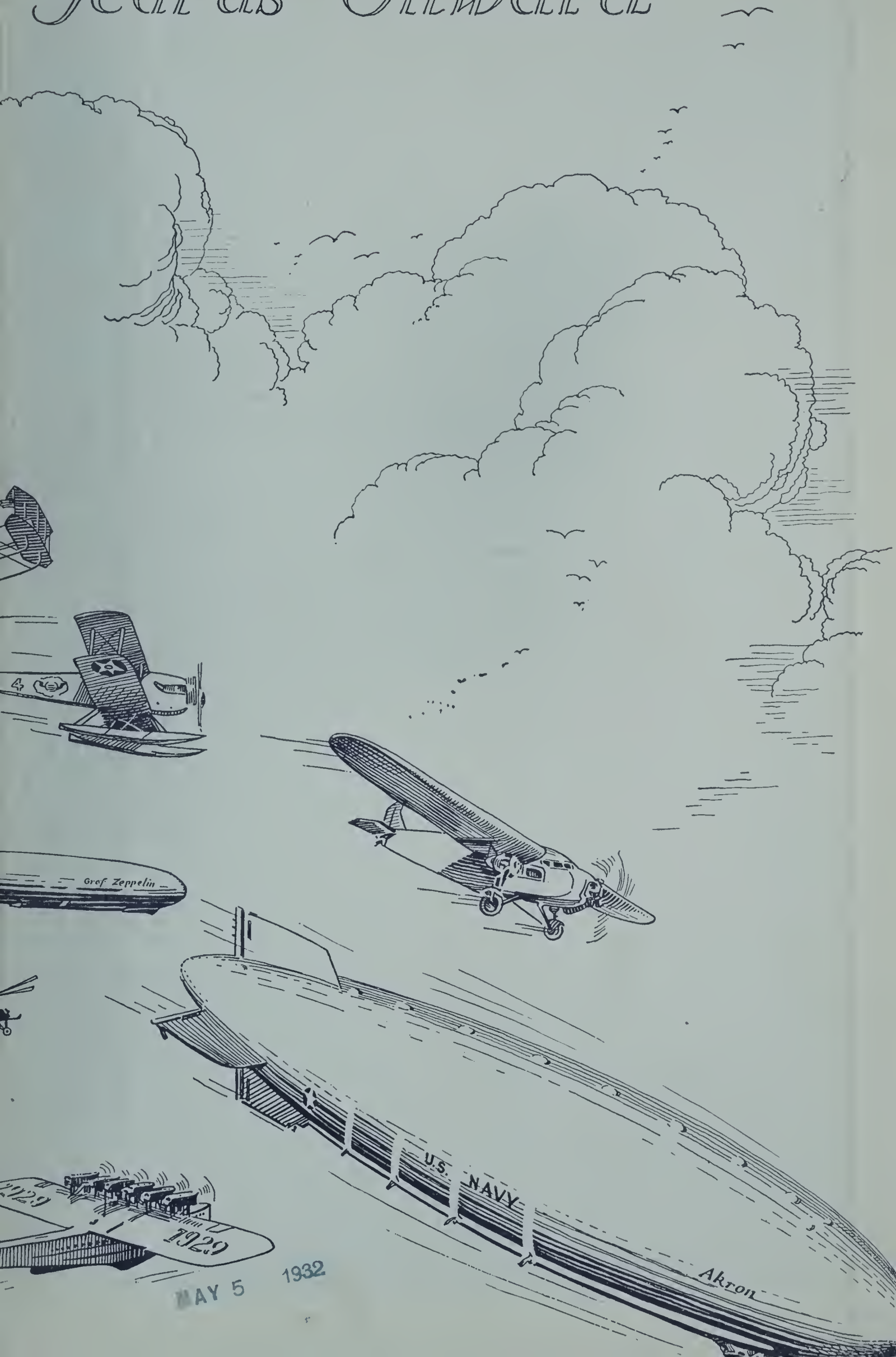








# Journeys Onward



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