

HAVE LONG SOUGHT MASTERY OF AIR

Ambitious Minds Would Control Only Element That Has Defied Man

Now It Is Thought That the Aeroplane Devised by Wright Brothers May at Least Point the Way to Success---Could Laugh at Vessels of War.

NEW YORK.—Those reticent and intensely absorbed westerners, the Wright brothers of Dayton, O., appear to have at last conquered the elements which have so long baffled the ingenuity of man, and aerial navigation, so long regarded as a fascinating absurdity, now seems to be very much of a practical reality, says a writer in the New York Times.

Aside from the triumph of the long and apparently easily controlled flight, the most important item contained in the news dispatches from Mantou, N. C., where the brothers have been conducting their experiments, is the statement that the aeroplane not only carried both men, but carried them in a sitting position. The earlier aeroplane of these inventors carried but one aviator, and it was necessary for him to be prone upon his stomach.

The significance of the statement lies in the apparent fact that the inventors have at last succeeded in overcoming the real problem of mechanical flight—the problem of equilibrium. Aeroplanes that would support their operators have previously been tested. Engines of sufficient lightness to propel them through the air at a sufficient speed and to carry their own weight and that of the operators have also been successfully tried. There have been plenty of aeroplanes that would fly in still air. The one needful, essential, and undiscovered thing was an airship that would not capsize when the wind was blowing.

Writing in a recent issue of McClure's Magazine, George Kibbe Turner quotes the Wright brothers as asserting that no one who had not navigated the air can appreciate the real difficulty of mechanical flight—that the great problem—the problem of equilibrium—never occurs to any one who has not actually tried flying.

to solve the problem of equilibrium by some automatic system of balancing. We believe that the control should be left to the operator. The sense of equilibrium is very delicate and certain. If you lie upon a bed three-quarters of an inch out of true, you know it at once. And this sense of equilibrium is just as reliable a mile above the earth as it is on it.

"The management of our aeroplane like that of the bicycle, is based upon the sense of equilibrium of the operator. The mechanism for preserving the balance of the machine consists of levers operated by simple uniform movements which readjust the flying surfaces of the machine to the air. The movement of these levers very soon becomes automatic with the aviator, as does the balancing of a bicycle rider, and simpler to operate than a bicycle. In fact, the aeroplane is easier to learn. In all our experiments with gliding and flying machines, we have not even sprained a limb; we have scarcely scratched our flesh."

Fatalities Among Inventors.
But if these two experimenters have had immunity from mishap their predecessors have not. Among the first to undertake the task of demonstrating that a mechanical flying machine is possible was Otto Lillenthal, a German mechanical engineer. He made a study of the flight of birds and eventually concluded that very little was known of the laws which govern the flight of the feathered tribe. He began experimenting in 1891, using wings constructed like those of soaring birds. Equipped with these, he sailed down hill sides into valleys. After a series of more than 2,000 flights one of his wings gave way one day and in his tumble to earth he dislocated his spine and died the following day.

That was in 1896. Three years later an Englishman, Percy S. Pilcher, be-

"We had worked out a new method of practice with gliding machines," they explained. "Lillenthal and Chanute had obtained their experience in flying with the operator's launching himself from a hill and gliding down on to lower land. This involved carrying back their apparatus, after a short flight, to the top of the hill again. Because of the difficulties of this awkward method, although Lillenthal had made over 2,000 flights, we calculated that in all his five years of experiment he could not have been actually practicing flying more than five hours—far too short for the ordinary man to learn to ride a bicycle. It was our plan to follow the example of soaring birds, and find a place where we could be supported by strong rising winds.

"A bird is really an aeroplane. The portions of its wings near the body are used as planes of support, while the more flexible parts outside, when flapped, act as propellers. Some of the soaring birds are not much more than animated sailing machines. A buzzard can be safely kept in an open pen 30 feet across and ten feet high. He cannot fly out of it. In fact, we know from observation made by ourselves that he cannot fly for any distance up a grade of one to six.

"Yet these birds sailing through the air are among the commonest sights through a great section of the country. Every one who has been outdoors has seen a buzzard or hawk soaring; every one who has been at sea has seen the gulls sailing after a steamship for hundreds of miles with scarcely a movement of the wings. All of these birds are doing the same thing—they are balancing on rising currents of air. The buzzards and hawks find the currents blowing upward off the land; the gulls that follow the steamers from New York to Florida are merely sliding down hill a thousand miles on rising currents in the wake of the steamer in the atmosphere, and on the hot air rising from her smokestacks."

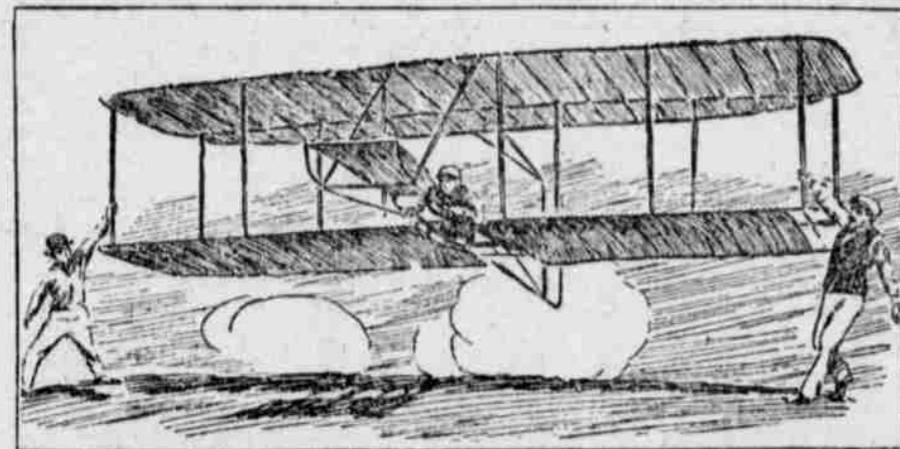
Think Great Speed Possible.
The brothers believe that the eventual speed of the aeroplane will be easily 60 miles an hour, and may be

wing, but the faster the speed the less will be the supporting surface necessary, and wings for high speeds will naturally be very small. Not only will less support be needed, but the size must be reduced to reduce the friction of the air."

Fearful Only of Capsize.
Although one of the brothers had an ugly fall only a few days ago, they both maintain that the only danger to be apprehended from an aeroplane is the danger of a capsize. A breakdown, or a sudden stopping of the engine, they say—and they certainly should know—does not entail disaster, as on the first thought it might appear. Their explanation is that while the aeroplane is supported in the air through its own motion through it, yet gravity furnishes all the energy that is needed to get safely to the ground. When the power is shut off it merely scales through the air to its landing. Theoretically, it is safer at a mile above the earth than at 200 feet, because it has a wider choice of places in which to land; you can choose your landing from 256 square miles from a mile above the surface if descending one in sixteen. "As a matter of fact," they said, "we always shut off the power when we start to alight, and come down by the force of gravity. We reach the ground at so slight an angle and so lightly that it is impossible for the operator to tell by his own sensation within several yards of where the ground was first actually touched.

"We feel that it is absolutely essential for us to keep our method of control a secret. We could patent many points in the machine, and it is possible that we could make a success of the invention commercially. We have been approached by many promoters on the matter. But we believe that our best market is to sell the machine to some government for use in war. To do this it is necessary for us to keep its construction an absolute secret."

To the same writer the brothers made the interesting statement that they did not expect the aeroplane ever to displace the railroad or the steam-



The Wright Brothers have conducted their experiments with great secrecy. The above illustrations give, however, an excellent idea of their aeroplane. They are from photographs taken from a distance for McClure's Magazine. The upper picture shows the glider in motion. The lower picture shows the method of starting.

Thus, the real question of the flying machine is how to keep it from turning over.

Air in Constant Turmoil.

"The chief trouble," the brothers explained, "is the turmoil of the air. The common impression is that the atmosphere runs in comparatively regular currents which we call winds. No one who has not been thrown about on a gliding aeroplane—rising or falling ten, 20 or even 30 feet in a few seconds—can understand how utterly wrong this idea is. The air along the surface of the earth, as a matter of fact, is continually churning. It is thrown upward from every irregularity, like sea breakers on a coast line; every hill and tree and building sends up a wave or slanting current. And it moves not directly back and forth upon its coast line, like the sea, but in whirling rotary masses. Some of these rise up hundreds of yards. In a fairly strong wind the air near the earth is more disturbed than the whirlpools of Niagara.

"The problem of mechanical flight is how to balance in this moving fluid which supports the flying machine; or, technically speaking, how to make the center of gravity coincide with the center of air-pressure. The wind often veers several times a second, quicker than thought, and the center of pressure changes with it. It is as difficult to follow this center of pressure as to keep your finger on the flickering blot of light from a prism swinging in the sun.

"It has been the common aim of experimenters with the aeroplane to

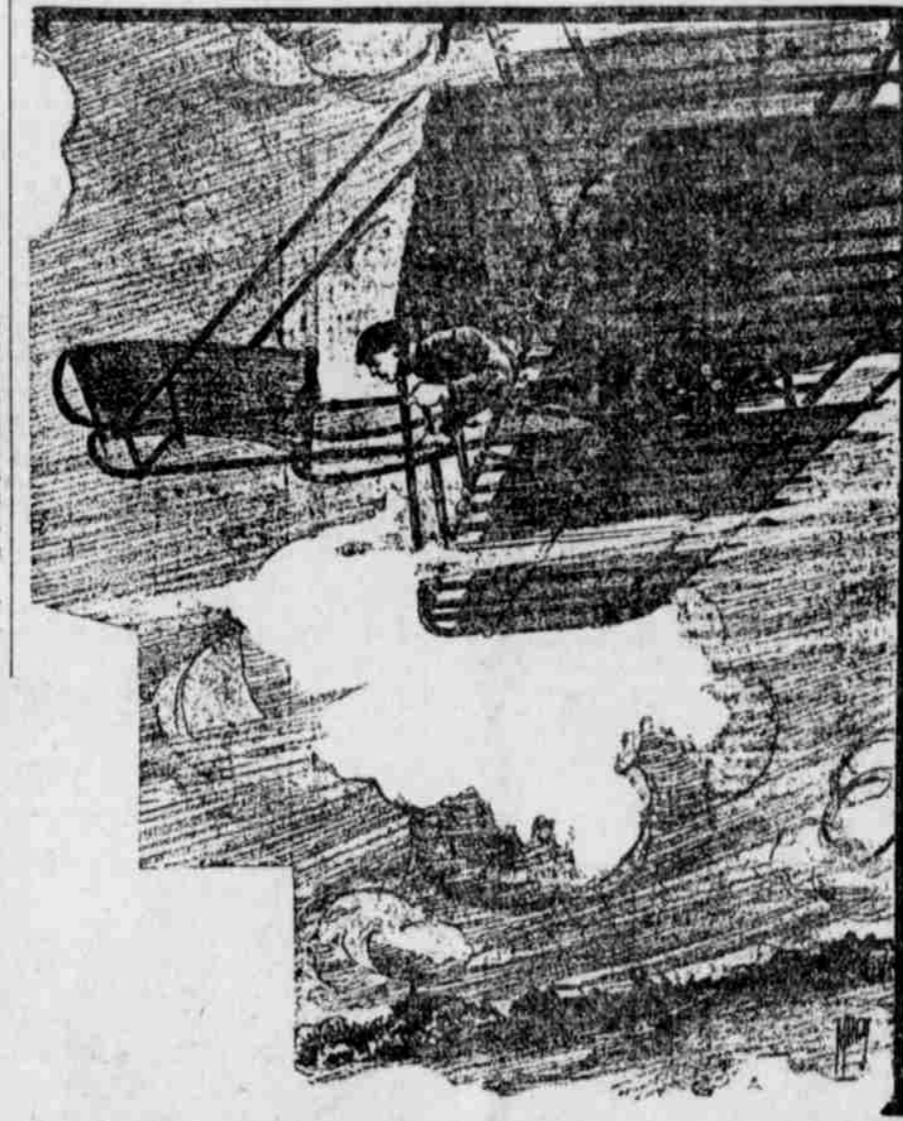
gan experimenting along the same line: He had essayed only a few flights when one of his wings broke and he sustained injuries which caused his death a few days later.

On this side of the Atlantic, Prof. S. P. Langley conducted some notable experiments, fashioning in 1896 a small, steam-driven aeroplane which made a flight of three-quarters of a mile. In the same year Chanute of Chicago constructed a gliding machine which attracted some attention. Four years later the Wright brothers, two young bicycle makers of Dayton, began experimenting.

It was not long before their efforts began to attract attention. But they sedulously avoided notoriety, kept their own counsel, and devoted themselves to the task of solving the problem of mechanical flight. Mr. Turner, however, gained their confidence, and thus describes them: "Two lean, quiet men in a dingy, commonplace little brick bicycle shop; pleasant, unassuming, most approachable, but shy and silent under the oppression of the greatest secret of the time. Orville, of the more social and conversational temperament, did the greater share of the talking—an amiable, kindly-faced man of 35. Wilbur—prematurely bald, about 40, with the watchful eyes, marked facial lines, and dry, brief speech of a naturally reticent man."

Their New Method.

To quote his account of what the brothers told him just prior to their going abroad last year for the demonstration of their machines before foreign war departments:



forced up to 100 miles. "Our experiments have shown," they said, "that a flier designed to carry an aggregate of 745 pounds at 20 miles an hour would require only eight horsepower, and at 30 miles an hour 12 horsepower. At 60 miles 24 horsepower would be needed, and at 120 miles 60 or 75 horsepower. It is clear that there is a certain point of speed beyond which the air resistance makes it impossible to go. Just what that is experiment will determine. Every year gas engines are being made lighter—a fact which will increase the surplus carrying power of the machine available for fuel and operator and heavier construction, but at present 60 miles an hour can be counted on for the flying machine. This, of course, means speed through the air.

"The aeroplane running 60 miles an hour will have surplus lifting power enough to carry fuel for long journeys. Our 1907 machine will carry gasoline enough to fly 500 miles at a rate of some 50 miles an hour. We can, and possibly soon will, make a one-man machine carrying gasoline enough to go 1,000 miles at 40 miles an hour. Moreover, any machine made to move at speeds up to 60 miles an hour can be operated economically at a cost of not much over one cent a mile for gasoline.

"There is no question that a man can make a lighter and more efficient wing than a bird's. A cloth surface, for instance, can be produced offering less surface friction than feathers. The reason for this fact is that a bird's wing is really a compromise. It is not made for flying only—it must be folded up and got out of the way when the bird is on its feet, and efficiency in flying must be sacrificed to permit this. The wings of aeroplanes will vary in size according to speed. A slow machine will require a large

boat. They predict that its chief value will be in war time, when it may be employed for dropping explosives upon an enemy or for reconnoitering purposes. In this connection may be added the fact that the navy department has planned an extensive series of experiments with dirigibles, the purpose being to discover their availability for war usage. Those who advocate the employment of these machines point out the fact that flying machines sailing over a fleet are immune from any attack save that of small arm fire, and that they could attain a height so great as to be out of range from these smaller weapons. There is no type of larger gun now carried on shipboard that is capable of such extreme elevation. Of course it would be easily possible to construct a gun mount that would permit of high angle, or even vertical fire, but the question is asked how would you be able to hit one of these small targets sailing so high in air?

When firing at a floating target any error of sighting can be detected by the splash of the shell. But how is a gun-pointer to tell where his shells are going when he is firing upward into the air?

No Danger.

"Whatever you do, dear," wrote the ardent lover, "don't show my letters to anyone."

"Have no fear, dearest," came the reply. "I'm just as much ashamed of them as you are."

And, with that, the engagement became a matter of history.—Judge.

These New Coiffures.

"What a queer ornament Miss Snuffie wears in her hair!" said Mrs. Trulywed. "Can you see what it is?" "Yes—that's not an ornament. It's the price tag," answered Miss Belle Tinkly.—Cleveland Leader.

The Colonel's Campaign

BY CHARLES MOREAU HARGIS

Col. Leith was proud of his possession. The big, red, vociferous car exactly suited his mood—for he liked to do things hurriedly; he worshiped swiftness. Even now he had left the fort by the valley road and was dustily tearing toward Rockwell City, four miles away.

So Col. Leith went unconsciously on his way, driving his motor car faster and faster—until something happened. Something usually does happen with motor cars. Several things happened first and last with this one and the colonel.

This was a comparatively harmless happening. He cavorted around the bluffs by the city's edge, careened through the deep cut by the river—and came plump on Grace Dewey, daughter of the best known ranchman in the valley.

Her mount reared, but trained horsewoman that she was, she kept her seat in the saddle. The car wheezed and the horse reared again. This time she did not keep her seat, but went down in a limp bundle to the hard road, while the horse raced up the ravine, as if it, too, were working for a speed record.

To make the incident the more striking, Lieut. Roberts just then came cantering down the highway, his accoutrements jangling and his cavalry charger doing its prettiest gait.

Roberts and the colonel were at the girl's side simultaneously.

"I am sure I did not mean—" began the colonel.

"Let me assist you, mites," and the lieutenant was lifting her, his arm around her shoulders and her jaunty hat resting against his coat sleeve. At that identical moment the lieutenant and the colonel parted company as friends. They did not realize that they were at the separation of the ways, but it was so. Miss Dewey opened her eyes, looked into the colonel's face; then recognized the lieutenant—and straightened up, fully recovered. They were not strangers; all had met at Mrs. Marson's reception a month before.

"I am not hurt—not hurt. But where is Rex?" she asked, looking anxiously around.

"I think, madam," replied the colonel, bowing with awkward and old-fashioned courtesy, "that he is just

crossing the Rocky mountains by this time, if he kept on going at the rate he started. But may I take you home?"

He motioned toward the vociferous red car that panted and rumbled by the roadside.

With Roberts riding stiffly behind, talking at intervals to the passenger, they made their way slowly across the long bridge and over the broad valley toward the wide-porch bungalow-dwelling of the Dewey ranch.

The next day the colonel sat in his leather chair and again went over the affair at the ravine. A long time he mused, and now and again a smile lighted the bronzed face. Twenty years in the army, four at West Point—yes, it was time. He would think more about it.

From that time it was a race between the colonel and the lieutenant. The colonel drove as swiftly as ever; the lieutenant took lonely horseback rides. Then one evening Roberts called on his commander.

"I would like absence for a few days, sir."

"Going to leave us?" queried the colonel. "You know we may have marching orders for the maneuvers soon."

"No—no, not a great distance, sir." The lieutenant was embarrassed.

The leave was granted and the colonel was secretly glad to do it. The field would be clear for awhile, at least. He ordered his car for the early evening.

"See that it is in perfect trim. James," said he to his servant. "I may want to take a long run."

Out over the open plains he went, 20 miles an hour, the fresh breath of the level lands beating his face and the inspiration of wide reaches of untrammeled view delighting his eyes. Turning into the valley along the river, he came to the tall cottonwoods, once the hiding places of savages with whom the early commanders of the garrison had fought. The lamps flickered on the underbrush—



Her Mount Reared.

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What—stop! Reverse the engine! Close in front were rearing figures. Two horses were plunging in the roadside, one had fallen, tangled in a barbed wire fence that some reckless farmer had strung close to the road. The colonel leaped from his car and ran to help the travelers out of their predicament.

"Be careful, mites—there, I'll help you up," and he lifted from the vine and tall grasses beside the road a slender form garbed in gray.

"Is she hurt?" came a voice from the depth of the tangled saplings, as her companion forced his way toward them.

Turning, the colonel recognized in the bedraggled cavalier—Roberts.

He almost feared to look at the young woman who was regaining her feet—but he did. It was as he suspected.

"I am so sorry—" he began. "I supposed there was a clear road."

"We don't blame you at all," replied Roberts, cheerfully, "but the fact is, it is somewhat embarrassing. Grace's—Miss Dewey's horse has run off and we—that is, well, we want to get to Rockwell City mighty bad—and quick!"

"I am sure it was no fault of yours," added the young woman, now regaining her feet and showing a constantly increasing discomfiture.

The red motor car glared at the trio wickedly as if it were glad it had disconcerted the plans of any enemy of its master.

"Now, colonel, I hate to tell you this," began Roberts, nervously. "I am sure you will sympathize with me and with Grace—Miss Dewey. You see, colonel, we are—that is, well, we are going to be married."

If the red automobile had turned somersaults, if the river had suddenly stood on end, the colonel could scarcely have been more taken aback. He turned his face so that it would not show pale in the glare of the pilot lamp.

"Yes, I understand," he finally managed to say.

"And Miss Dewey's father does not like it very well," with the suspicion of a laugh in the words. "In fact, he will probably be after us when he finds out. We have come this roundabout way to throw him off the track—and you see where we are?"

"Yes, I see," was the slow response. The colonel's voice was strangely cold, and he was conscious of a distinct effort in getting the words out in the proper form. "I see. You are afraid he will catch you before you are married? He does not like army men?"

There was an odd twist in the colonel's voice as if he, too, were inclined to smile.

"Papa has his prejudices, you know," put in Miss Dewey, demurely. "He will miss us before long;" the lieutenant's words fairly dripped with excitement. He peered anxiously down the road. "And Grace's horse has gone for good."

"My duty is clear," began the colonel, his voice still husky. "I know very well that you young people should be taken in charge. You, lieutenant, should be put under arrest, and you, Miss Grace, ought to be turned over to your father. You both know that this should be done."

He had not looked at them while he talked—now that he did, he saw that Roberts' arm was around the rancher's daughter, and that her eyes were gazing appealingly toward him. He always had admired those blue eyes—he looked into them, his heart in the glance, then with a dash of his hand wiped out the vision.

"You scapegraces deserve this—but I don't know that your father, miss, is any friend of mine. Where did you say you wanted to go?"

"To Rockwell City—to a minister's," eagerly exclaimed Roberts.

"Climb in here—send that horse of yours up the road—we'll get him in the morning." His orders were positive and definite.

A stroke of the whip and the lieutenant's mount went racing up the path after the ranch girl's Rex. Roberts and Grace clambered into the car. With a crunch the car started, and in another minute they were speeding toward Rockwell City, 40 miles an hour.

Up the deserted street, across the railroad tracks, past the hotel with its many lights they sped. With a jolt they stopped at a modest dwelling on a side street. Col. Leith was first to leap from the car.

Gently he helped the young woman from her place, and his strong hand was in hers as he gave her to Roberts' care.

"This is a very informal and undignified proceeding, young people," he began. "I am sorry to see you do this way." He was talking against time, for so long as he talked her hand lay in his. "I am not going to give my approval—but I will give my blessing."

He hesitated a little. "As for you, Lieut. Roberts, if you show yourself on the reservation for two weeks, you will be placed in the guard-house. Good luck—good-by!"

As the colonel left the town behind on his way to the post, he met an eager rider hurrying cityward. He might have told him some interesting news had he wished. Instead, he pushed the car to a swifter speed. Why cause people unnecessary worry?