

# 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.

**N**EW 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.

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-

## DAY OF TELEPHONE

### ITS USE IN RAILROAD OPERATION IS AT HAND.

**Practicability of Innovation Seems Assured—Development of Telegraph System Will Do Much to Forward It.**

That recently enacted laws affecting the hours of labor for railroad employes may result in the substitution of the telephone for the telegraph in railway operation is asserted editorially in the Railway Age, says the Literary Digest. Such laws, the writer tells us, have within the year been enacted by congress and by the legislatures of eight states. For telegraphers Wisconsin limits the consecutive hours of service to eight, West Virginia to from eight to twelve, and the federal law to nine for day and night stations and to a maximum of 13 (for not more than three days per week) for day stations. Says the Age:

"The necessity of providing additional operators, which is now imposed by reason of these statutory limitations as to permissible hours of labor for telegraphers, presents a serious problem for railway officials in charge of operation, and in seeking a solution the telephone will undoubtedly receive very serious consideration. Several systems, including the New York Central, the Pennsylvania, and the Union Pacific, have established schools of telegraphy in order to educate operators. Other roads have had recourse to the telephone as an auxiliary, and the Pennsylvania and New York Central as well have made experimental installations. The practicability of utilizing telephony in train-dispatching has greatly increased by the development of the telegraph system, which, by providing selective devices in connection with the telephones and the Morse instruments, permits the use of one circuit for the simultaneous communication of telegraphic and telephonic messages. The Southern Pacific system has now on the Sacramento division 25 station telephones; these are at points from 30 to 40 miles apart, and from the stations so equipped communication may be had with intermediate stations by telephone. Also train crews may communicate with the operators at telephone stations by connecting telephone instruments carried in the baggage-car or caboose with the telegraph wire by means of a fishpole device, such as used on many interurban electric roads. The advantages in permitting the employment at intermediate stations of station agents who are not telegraph operators are apparent, and the system, which has been in operation for about 18 months, has been found to work satisfactorily in every way. One disadvantage sometimes urged against telephony as a means of directing train operation, namely, that a very large portion of sounds heard over a telephone are unintelligible, except in connection with the context, is found in practice to be of no importance, since train orders are stereotyped in form and the knowledge of the hearer as to the general subject of the message causes that association of ideas which is necessary for ready comprehension of what to one not familiar with the work might be unintelligible sounds, and experience has demonstrated that, with the same rules as regards the repetition and checking, train orders may be transmitted by telephone with the same degree of safety as by telegraph."

**First Dining Car.**  
"Just 40 years ago," said T. C. Newton, a Chicago railroad man, "the Chicago & Alton railroad put on the first dining car ever operated on any railroad train in the world. This was on the run between Chicago and St. Louis. If that car could be exhibited now it would create universal merriment. It had oilcloth table covers, the seats were screwed to the floor, and its illumination depended on candles.

"Think of the contrast between that primitive affair of 1868 and the modern dining car, finished in solid mahogany, with gorgeous furniture and a menu as elaborate and cooking as dainty as that supplied by any of the foremost hotels of America. Verily, we have been 'going some' in the four decades that have gone by since the first crude experiment."

**Argentina Railroad Construction.**  
The railroad lines of the Argentine republic have reached the border of Bolivia, 1,200 miles from Buenos Ayres, and as the result of a treaty with Bolivia the Argentine government is making engineering studies for the prolongation of its line to be built by the Speyer-City bank syndicate of New York. In July the New York syndicate will have finished the first section of the Bolivian railway under its contract with the Bolivian government.

**Average Variance in Cost.**  
The average capitalization of the 220,153 miles of railroad in foreign countries is \$108,000 a mile. In the United States the average for 222,340 miles is a little more than \$58,000 a mile.

**Electric Locomotives a Success.**  
The New York, New Haven & Hartford Railroad Company is now operating 48 electric locomotives and it is stated that there is not the least dissatisfaction with the results.

## THE RAILWAY ENGINEER.

There are heroes famed in story, rightly famed, for deeds of arms. Men who've fought their country's foe-men, and in sudden night alarms Have rushed out to shots and shouting in the smoke and reek and dark. Never pausing, never heeding, offering themselves a mark: Going where their duty called them in the nation's game of war; Finding death or finding glory never questioning what for.

But peace has its greater heroes, men of throttle and of wheel. Men who, crouched in their cab windows, drive their panting steeds of steel Over moor and fen and mountain, dashing over trestles high. Thrown across deep cleft and chasm like mere cobwebs 'gainst the sky. On whose nerve hang lives of hundreds as they leave the station light And with straining of steel sinews plunge afar into the night.

Men who, facing swift disaster, are braved up to such a height. That each nerve and joint and muscle springs to do the thing that's right; Men who, when they can't avert it, go to death clear-eyed and brave. With strong hands closed on the throttle in a last attempt to save; Hope of glory or of pensions is not theirs, no more than fear. Aye, indeed, peace hath its hero in the railway engineer.

—J. M. Lewis, in Houston Post.

## WINTER TRAVEL IN SIBERIA.

**Passengers There Are Frequently Snowed Up for Days.**

When winter sets in adventures by rail are frequent, and the process of "roughing it" is trying. Often trains are snowed up at little squalid stations on the steppe, where the passengers can get nothing but black bread and tea. For hours? Aye, and for days. It depends on the authorities how long the ill-starred travelers shall abide.

This year numerous trains were caught in the snow, almost buried there, and generally on the open steppes 50 or 60 miles from a lemon and 100 miles from a beefsteak. The passengers besought the station master and others to have them dug out and to clear the line. Their eyes telegraphed to the minister of ways and communications, and received assurances that the order would be given. It was given—and disregarded.

Story telling and card playing in the flickering light of a candle were the most serious occupations of the prisoners on the steppe. In one case "he" and "she" met for the first time under these uncommon conditions, fell in love over a sausage, a stale roll and half a bottle of wine, which he happened to have, and they married shortly afterward.

Here is a copy of one of the telegrams from snowed-up passengers that were sent last season: "This is the second day that we are kept by snowdrifts here in the lonely station, Pookhovo. In spite of the energetic telegram of the minister of ways and communications the manager of the line has taken no efficacious measures. We are doomed to linger on here for an indefinite period." (Signed by the passengers of the international wagon of the Rostoff fast train.) And they lingered on for two days.

**Railroad Stolen Overnight.**  
Citizens of this community are much distressed over the fact that the only railway they owned has been stolen. Everybody was proud of the railroad, and the fact that it was only five miles long did not make them any the less loyal.

The railroad was stolen some time last Friday night. It was there when the citizens went to bed at the usual hour, and it was gone when they arose Saturday morning. Where it went is a mystery.

There is a suspicion that some high financier hired a lot of men to roll up the track and carry it away like a carpet. President Botta, who is also general manager, conductor and engineer, said:

"Before going home I locked the engine up in the barn and chained the railroad to the trees. I also took the precaution of nailing down the right-of-way. When I came out the next morning there was not even a spike left. At first I thought the system had been mislaid, but careful search destroyed that theory."

A reward has been offered for the railroad, and, meanwhile, all business here is at a standstill.—Sherman (Pa.) Correspondent Philadelphia's North American.

## Low Wages for Railroad Men.

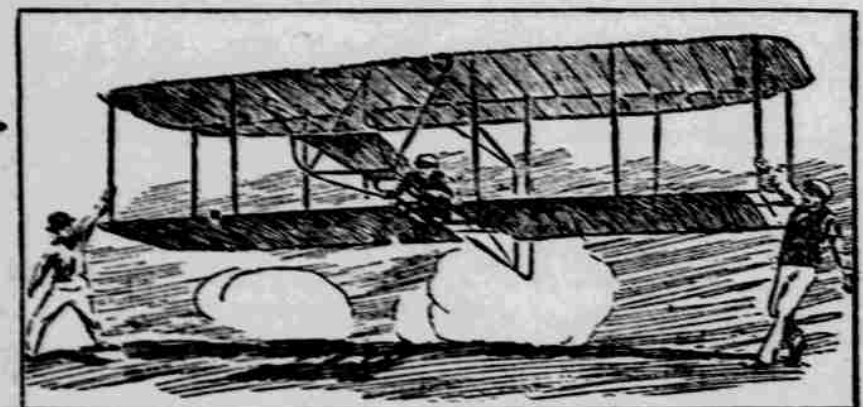
A report on the number of railroad employes in England, with the amount of wages paid by classes, just published by the Amalgamated Society of Railway Servants, is the first complete one of the kind that has yet been issued. The report covers, for the United Kingdom, 255,239 "railway servants." The fact is shown that over 100,000 of these are working at a wage of £1, or \$4.86 a week, and that more than one-half of the railway employes of the United Kingdom receive £1 to £1 10s, or \$4.86 to \$7.29 a week. It also appears that only about 11 per cent receive more than \$7.50 a week.

## Ties Rapidly Becoming Scarce.

In the United States last year 106,000,000 railroad ties were used, which denuded 600,000 acres of forest to supply. The British railways are supplied from Russia, 4,000,000 ties a year being needed. The Russian forests are now so much exhausted that the peasants have to sledge the trees for making these ties a distance of 20 miles to get them to the rivers.

## Block System Spreading.

There are now not far from 60,000 miles of railroad under block signal operation, nearly 10,000 miles of which have been added within a year and a half. All of this mileage is distributed among 34 different systems.



The Wright Brothers have conducted their experiments with great secrecy. The above illustrations give, however, an excellent idea of their aeroplanes. 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 of 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 you 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 Snuffles 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.