

WALTER WELLMAN ON THE FUTURE OF AERIAL NAVIGATION

IN a book about to be published by A. R. Keller & Co. of this city Walter Wellman recounts his adventures in quest of the north pole and his attempt to cross the Atlantic in an airship. He also gives his views on the subject of the future of aerial navigation. On this subject he says in part:

We may now say with truth that man has at last realized his centuries-old aspiration. He has conquered the air. He has successfully navigated the ocean of atmosphere which surrounds our earth. With persistence, ingenuity, courage, sacrifice, heroism, devotion, loss of life, and fortune man has kept at his task, advancing little by little, step by step toward the ultimate triumph.

To-day the greatest fact in the progress of mankind toward the full realization of his mechanical possibilities is this: Man flies; man soars in the air; he converts himself into a great bird; he spreads his wings, sets in motion his motor muscles, rises from the earth, sets out determined to reach a given destination a long way off, flies straight toward it, reaches it, descends. This is aerial navigation; it is conquest of the air. It is one of man's most wonderful achievements. And in my opinion the triumph of it in nowise depends upon man's ability to make general commercial application of his new-found art, his latest victory over the elements.

And yet the question is everywhere asked: Now that man has achieved aerial navigation how much practical use is he going to be able to make of it in the world's work? No other question is to-day more discussed throughout Christendom. No other rouses more curiosity or develops wider range of opinion. We may say, looking at the matter broadly, that the foremost engineering and mechanical problem of to-day is: Can aerial navigation be commercialized? If so, how, by what method, with which type of machine?

First, to clear away all doubts, let me state my firm belief that aerial navigation is as yet in an experimental stage. We are virtually in the infancy of the art. We have only begun to demonstrate its possibilities. It is only within the past four or five years that the motor balloon has been developed into a practical and fairly dependable instrument of air travel. It is only within the past

From Facts Gained in His Own Experiences He Points Out What Is Needed to Conquer the Air.

three years that mechanical flight has been demonstrated in such practical fashion and upon such a scale as to convince the world that aerial travel is here at last.

The ingenuity, skill, and courage that accomplish all this in such a short time must be regarded as the forerunner of much greater things to come. At the present moment the precise method of attaining the vastly larger and more important results may not be in sight. We cannot say that it is. Moreover, so far as any existing type of machine is concerned, certain limitations of the art of aerial navigation, set by physical conditions, may be regarded as interposing almost, if not quite, insuperable obstacles to further important development—development which would carry the art to the general commercial application so much discussed and desired.

While it is true that these limitations are sharp and apparently insuperable, it must be remembered we are considering them only as they apply to present types of machines, both lighter and heavier than air. There is every reason to hope that new types are to be developed which will rise superior to the limitations. All over the world men are studying aerial navigation. They are experimenting with new apparatus, building, testing, tearing down, reconstructing, keeping at it. Perhaps it is safe to say that throughout the world 50,000 men are to-day giving all or most of their time and energies to this fascinating problem. Many of these, it is true, are mere mechanics, whose point of view is restricted largely to details and to experiments therewith. From such workers as these improvement of the existing types of machines may be expected; perhaps nothing revolutionary, but a gradual progress toward perfection.

Not only mechanics, but men of science and engineering are at work upon the problem—men who take the broad view, who study everything from the beginning, who take into consideration all

the laws of physics and aerodynamics involved, and who seek, not mere perfection of details or improvement of present types, but the creation of new types which shall revolutionize the art and bring about another epoch in air travel. The Lillenthals, the Langleys, the Wrights, the Jakhots, the Zeppelins, the Chanutes, the Montgomerys, the Bleriot, the Santos-Dumonts, are not all dead, nor all inactive or worked out, nor giving their energies to the commercialization of the sporting and gate-taking aspects of the art to the neglect of its future.

Men of this class are of every country, every nationality. They are delving deep. I pin my faith to them. From one of them may come at any moment an invention, a discovery, or a combination, which will revolutionize the art; something that will go so far beyond a Zeppelin, a Lebaudy or an America, so far beyond the performances of the mechanical flight machines of to-day, that people will be wondering how they could ever have given so much attention and admiration to the crude contrivances of 1910.

My faith is strong that having demonstrated the practicability of air travel man will go on till he has developed flight into a state of perfection and usefulness not even indicated by the apparatus of to-day.

Whether or not full commercial utilization of aerial navigation is coming, soon or late, is a question which no one can now adequately or confidently answer. It may come; it may not. My own impression, rather than conviction, is that in the next half century we shall have limited rather than universal commercial application of the art. But within those limitations will be found much that is highly beneficial to humanity.

So great are the obstacles in the way of general commercial use of the motor balloon over land that we must frankly express a doubt if they can be overcome, though reserving the statement already made that for special commercial purposes, where the circumstances are un-

usually favorable, and in certain ocean traffic, these craft may be employed. Commercial aerial navigation, like any other navigation, means operation for a profit in competition with railways and steamships. Involved in operation for a profit are certain requirements well understood, but which it will be well to state. First, there must be a high degree of safety of operation, and reduction to a small minimum of the risk of accident to the ship itself and its passengers and cargo. Without this high degree of safety ships and their cargoes cannot be insured at practicable premiums, owners cannot afford to carry their own insurance, (since the inevitable losses must be made up in some way,) passengers will not offer themselves for voyages, and goods will not be tendered for transportation without insurance.

Next, ships of an aerial transportation line, like steamships and railway trains, must be fairly sure of setting out on a given schedule, and of accomplishing the voyage in a reasonably close approximation to the time advertised beforehand. It is clear that great uncertainty of departure and of time of arrival would constitute a handicap against the enterprise in competition with more stable modes of transportation.

These objections, sure to hold in the long run, might not apply sharply to an aerial line as long as the novelty remained. For the unusual experience of a trip in the air passengers might offer themselves and be willing to pay much higher rates of fare than they would have to pay upon competing lines. Some business of this character has been done in Germany, where the Zeppelin airship has carried a considerable number of passengers on short voyages at rates of fare which must be regarded as fanciful from the purely commercial standpoint.

One great obstacle to the commercial employment of a motor-balloon is the impossibility of taking a large ship of this character out of her shelter house without incurring serious risk of disaster, if the

manoeuvre be attempted at any other time than in a period of light winds or calm. It is axiomatic for obvious reasons that the larger the ship the more likely is she to give a good account of herself in the air. In a ship of great size there is opportunity to install powerful and heavy engines and to carry a reserve of fuel and ballast sufficient to meet many emergencies. This is true because the weight of an airship—the balloon, the car, the suspension, the motors, and permanent equipment—does not increase as rapidly as the displacement and the lifting power. Double the size of a well-built and well-equipped airship of the dirigible type, and you approximately quadruple the amount of lifting force which can be devoted to fuel and ballast and cargo.

But the larger the ship the more difficult it is to handle while not in the air under its own power. It must be taken out of the shelter house by means of guiding lines held in the hands of men, and with a large craft, if a considerable wind is blowing, this is a most difficult task. It is well nigh impossible to utilize enough men to make sure that the huge craft, when caught by the wind, shall not acquire momentum and bring on the danger of escape or of injuring itself. When such a ship is partly out of a hangar or balloon shed, and the wind catches it broadside, the risk is great that it may be thrown against the walls of the house and be damaged or destroyed, despite the efforts of the personnel to control it.

But the greatest obstacle to the commercial employment of airships of the gas type, save in special circumstances, is the uncertainty, which must cling about their arrival at their predetermined destination. Here the hazard is not so great as to preclude their use for sport, or exploration, or for the purposes of war. In all of these fields a certain amount of risk is inevitable, acceptable, a part of the game.

It is unfortunately true that it is impossible to build a motor-balloon, no matter how great its size and power, or how advanced its engineering and equipment, which can attain the same high degree of safety upon a voyage of considerable length as that which is common to steamships.