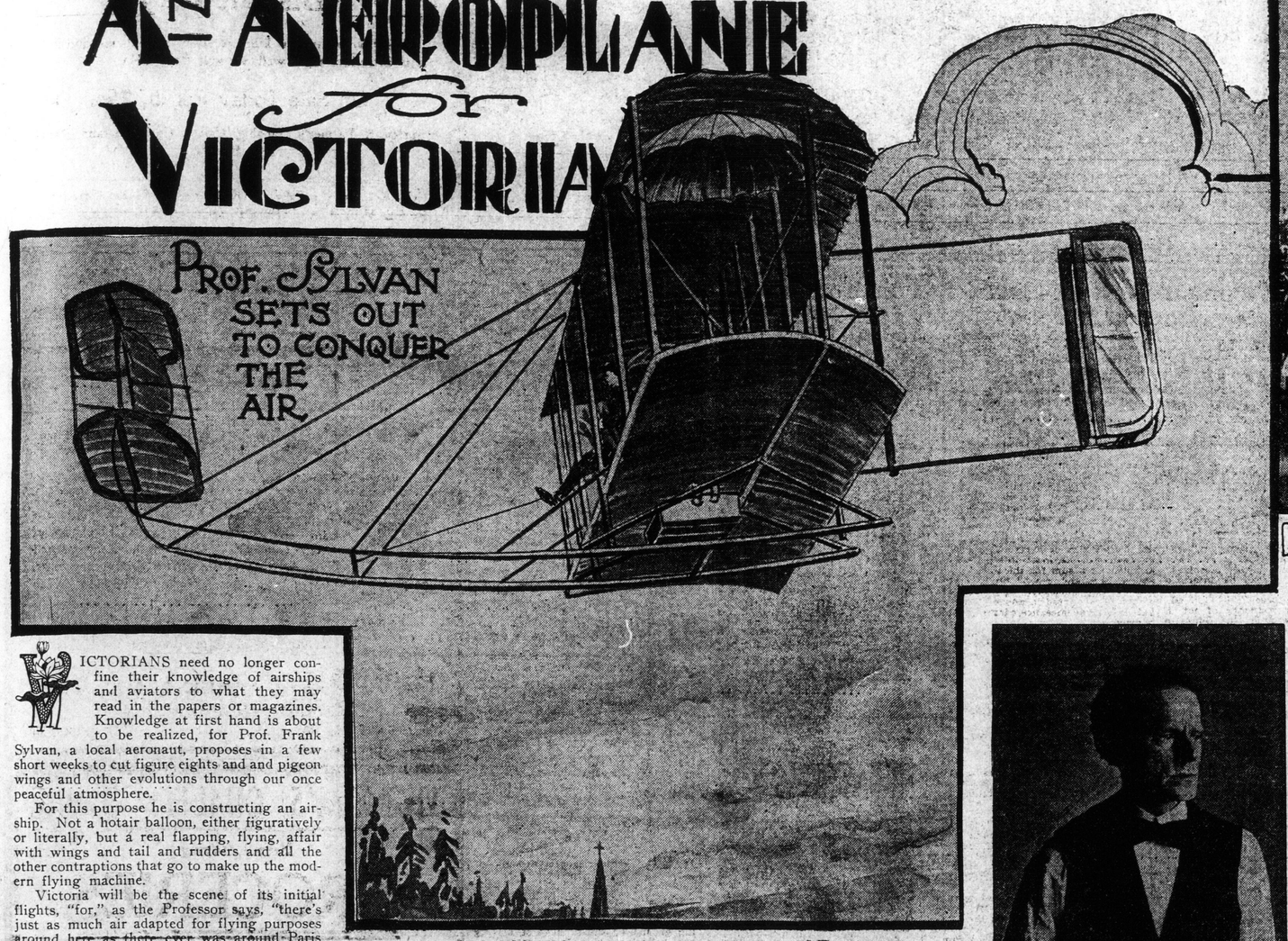
AN AEROPLANE FOR VICTORIA



ONE OF PROFESSOR'S BALLOONS

VICTORIANS need no longer confine their knowledge of airships and aviators to what they may read in the papers or magazines. Knowledge at first hand is about to be realized, for Prof. Frank Sylvan, a local aeronaut, proposes in a few short weeks to cut figure eights and and pigeon wings and other evolutions through our once peaceful atmosphere.

For this purpose he is constructing an airship. Not a hotair balloon, either figuratively or literally, but a real flapping, flying, affair with wings and tail and rudders and all the other contraptions that go to make up the modern flying machine.

Victoria will be the scene of its initial flights, "for," as the Professor says, "there's just as much air adapted for flying purposes around here as there ever was around Paris or the other haunts of noted aeronauts. And what's more," he continues, enthusiastically, "its better air.

"The atmosphere of Puget Sound offers fine resistance to the propellers because it is heavy and moist; in fact, at some seasons of the year it is so moist as to consist, I believe, of about half air and half water. Under such favorable conditions, a smart skipper could, by putting on enough canvas and reducing his ballast considerable, almost sail a fishing boat through it."

Whenever the Professor returns to earth for any considerable time, he takes up his practice of medicine, and then looking at things through professional eyes, and remembering the appalling list of broken arms and skulls that attest the perils of aerial navigation, he sees still another reason why Victoria should be thus honored. "There's no danger in flying," says he. "It's landing on the jagged rocks or solid earth that's dangerous; but, thanks to our situation, this difficulty can be entirely overcome by the simple expedient of sailing over nothing but water."

From these natural advantages, it can easily be seen that success will probably crown the efforts of the inventor and the machine with which he is entered to compete at the aerial races to be held at the A.-Y.-P. exhibition next summer.

Prof. Sylvan is a balloonist of long experience, and is remembered by Victorians for his nervy "sky-larking" feats at last year's provincial exhibition. His ability to dodge steeples and towers and avoid settling down on lightning rods or other sticky places, by frantically pulling this guy rope or slackening that one, or doing any of a score of acrobatic feats that might tend to change the slant of the fast-descending parachute, and thereby alter its course, is responsible for his innovation in aeroplane construction.

This consists of placing a rigid parachute at either end of a ship built on the general lines adapted by the Wright Brothers. A petrol engine of the type used in the "Silver Dart" will furnish sufficient motive power to keep the thing afloat, and all steering, guiding and other manoeuvres will be controlled by these two parachutes, which can be tilted in any direction that circumstances may demand or the agile Professor may wish. The engine being placed under the ship, gives better balance and is out of the way, thereby allowing a clearer space for the five levers which will control the motions of the vessel. The wings and rudders and after gear being practically finished, there remains only the assembling of the various parts and a few preliminary spins for the education of the almost proficient inventor, and then the citizens of Victoria shall see for themselves the Romance, the Comedy, and maybe the Tragedy of aerial navigation.

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MECHANICAL FLIGHT

(By F. W. Lanchester)

The interest that attaches to the subject of flight at the present time is mainly connected with the problem of dynamic flight, and in particular with the flying machines that are being tested and used experimentally by aviators on the other side of the Channel. At the same time, it cannot be denied that up to the present the dirigible, or navigable balloon or "air-ship," has shown itself to be an instrument of far greater capacity, alike as to speed, endurance, and safety, than would have been thought possible a few years ago. The dirigible has its advantages and its drawbacks in comparison with the dynamic flying machine, even allowing for the latter being perfected to a point not yet in sight, and after paying due regard to the rapidity with which the flying machine has come into existence and developed to its present stage, it may be anticipated that where the total useful load raised is a consideration, where the rapidity of rising is a point of importance, and where the duration of the flight is in question, the dirigible will be more than able to hold its own for very many years to come. On the other hand, the flying machine has taken the lead, and will probably continue to hold the lead, in the matter of flight velocity, and in general convenience and compactness, so that it may with some confidence be predicted that both types of aerial machine will survive, each utilizing to some extent the experience gained with the other, and each being employed in certain definite directions, to which it will be confined by its limitations.

The present position of the flying machine is not so far advanced as is popularly supposed. The flights that are made rarely exceed a few minutes' duration, and those occasions on which an hour has been exceeded can be counted on the fingers of the hands. The frequency of mechanical and other failures is such as to render a cross-country journey highly dangerous—in fact, at the present time any such attempts should be discouraged, and the offering of prizes for the crossing of the Channel or for flights involving the passing over or in the neighborhood of large cities should be discountenanced. There is no greater merit from the engineering point of view in flying over 25 miles of the English Channel than in doing the same distance over a prepared ground—in fact, the straight flight is if anything the less meritorious of the two; the only excuse for prescribing such a condition in the offering of prize money is the assumption that fulfilment is a definite proof of the reliability of the machine—which it certainly is not. On October 30 last Farman on his Voisin machine made what was practically the first cross-country flight—from Chalons to Reims—a distance of about 17 miles; this flight was made under the most favorable conditions, a great part of the route being over the extensive military grounds of Mourmelon-le-Grand, and thus the risk was reduced to a minimum. The return was made by road, the machine being packed and brought back on a motor-lorry. There was no other reason for returning in this ignominious way than common prudence, and common prudence is a quite sufficient reason for not undertaking feats of this kind—at present. Mr. Farman stated after his return that personally he would not have been at all afraid of attempting the return journey, but that it would be unfair to risk giving a setback to the movement, however slight that risk might be, without adequate reason. It is greatly to the credit of Mr. Farman in this connection that previously to undertaking his cross-country flight he made a series of four flights in succession, all exceeding his projected effort in duration, and so had proved his title to make a public demonstration of a more sensational kind; all this bespeaks an admirable self-restraint.

The performance of M. Bleriot the day following the Chalons-Reims flight of Farman forms with it a striking contrast, it is an example of what it should be the object of every sane man to avoid. M. Bleriot had made a large number of short flights before his cross-country attempt on October 31, many of which had ended in disaster to his machine, while his longest successful flight had been of very brief duration. On October 30 a flight was made which, as usual, ended in disaster, but the machine was repaired during the night, and on the 31st, after a short trial lasting 4 minutes 15 seconds (the most successful flight that up to that time M. Bleriot had made), a cross-country flight was undertaken from Toury to Artenay and back, a total distance exceeding that of Mr. Farman by perhaps a mile. M. Bleriot had to make two stoppages en route on account of temporary ignition failures, the first stoppage being near the turning point and the other during the return journey. It is impossible to regard M. Bleriot's performance other than in the light of a mad freak; the risks involved may be best gauged by the facts that an involuntary stoppage when flying at a low altitude may mean total destruction if no suitable alighting ground is at hand, and that a few days later the same machine lost its equilibrium and was completely wrecked, M. Bleriot, by something little short of a miracle, emerging from the wreckage unscathed. It is unfortunate that because one man, after taking all possible precautions, performs a notable feat, he must be followed by others who take no precautions at all and throw prudence to the winds; but such is very commonly the case. The men who are doing the real pioneer work understand the dangers; those who merely emulate their feats do not. Thus Mr. Wilbur Wright is one of the first to deprecate cross-country flights in the present state of the art, yet it is he, if we may judge from actual performance, who is best qualified to undertake such a feat. That the foregoing remarks are justified is shown by the following paragraph quoted from the account of M. Bleriot's flight in Le Matin:

"Satisfait de ce premier essai, l'aviateur prend tout a coup la decision de battre le record de Farman, etablie avant hier de Mourmelon a Reims, et qui parait avoir suscite chez lui une reelle jalousie."

At present the performances prescribed by the donors (and prospective donors) of prizes and other awards in this country are not altogether satisfactory from the point of view under discussion. Such feats as the cross-Channel flight, or the London to Manchester flight, could only be undertaken at present or in the near future at considerable risk, and risk that really is quite needless. If the same distance were laid out on a course, possibly along the coast, where no difficulty would be experienced in alighting at almost any point, the same result would be achieved with less risk of disaster; the conditions of the cross-country flight could be simulated to any desired degree by disqualifying, for example, an aeronaut who descends at other than the stated point or points from further competing—he might be counted as dead for the purposes of the competition in question—or some similar plan could be adopted. Whether any such scheme is feasible or not—there are enormous stretches of sand along the east coast exposed at low water that might well be utilized—it is certain that the conditions of these prize offers as they stand will prove a serious temptation to the foolhardy and thus they constitute a menace to the progress of the movement; a few fatal accidents would have a most detrimental effect in this country and would do incalculable harm. The whole question should be taken up without delay by one of the various self-constituted authorities that now exist—possibly a joint committee might be formed—with a view to rendering the conditions as safe as possible and to prevent ill-equipped and inexperienced competitors from entering the lists; failing some measure of this kind, the prize is for the gambler who holds his life sufficiently cheap and who has the good luck to get through. It would also be well to acquire such control over the future of the "sport" as will ensure further offers of prizes and cups being put on a proper footing as to the conditions under which they will be contested.

The recent development of the dirigible or "airship," though less sensational than that of the dynamic flying machine, has been scarcely less rapid. The principal improvements since the days of Tissandier consist in the application of the modern petrol motor in place of the electro-motor, in the employment of double rubber proofed "Continental" fabric in place of the varnished cambric or silk formerly employed, and in the use of directive surfaces at the after end of the balloon by which its attitude of flight is rendered stable—that is to say, the tendency to turn into a broadside position is obviated. The greatest speed attained in the days of the electro-motor was approximately 15 miles an hour; the petrol motor, first adopted by Santos Dumont in 1898, immediately showed its superiority, speeds of 20 miles per hour being very soon reached; the velocity attained by the modern airship is now well over 30 miles per hour, and as each new machine makes its appearance higher and higher speeds are recorded. The Zeppelin is stated to have touched 35 miles per hour. The limit of speed of a dirigible will in the future in all probability be due less to the difficulty in obtaining the horse-power needed than to the limit of the strength of the fabric that can be used, this at least must be the case with the non-rigid system. When a balloon is kept in shape by its internal pressure, the pressure required increases as the square of the velocity of flight; it has to be maintained at a point in excess of that of the regions surrounding the nose and tail (for the tail is a pressure region) in order to prevent the envelope from caving in, and thus there is a very considerable bursting stress on the fabric of the body of the balloon form, around which the pressure when in flight is less than normal—that is, less than atmospheric. To what extent the velocity is limited by considerations of this kind is yet to be determined; the danger is of the "cold explosion" of which Santos Dumont sometimes expressed fear.

At the present time the most controversial question that exists in connection with the dirigible touches precisely on the point under discussion; there are two rival systems, the rigid and the non-rigid. In the former, of which Zeppelin is the leading exponent, the envelope is stretched over a crinoline or cage made of aluminium, and the form of the balloon is maintained by the said cage, the gas inside being at approximately atmospheric pressure; in the latter, which is the system more generally adopted, the form of the balloon is maintained by the pressure of the enclosed gas and to some extent by the use of a long keel to which the car is attached, while the internal pressure is maintained by one or more air bladders contained within the balloon and fed by a centrifugal fan driven either from the motor or independently. The advantages claimed for the rigid system are, first, less danger of a "cold explosion" owing to the comparatively low pressures employed, and counterpart to this the practicability of higher speeds than are possible with the rigid system; secondly, a less rate of gas leakage owing to lower pressure differences; and, thirdly, the abolition of the centrifugal fan, lessening complication and conducing to safety. Against these advantages must be set down the great weight and unwieldly nature of the rigid frame and the greater liability to irreparable injury, both of which objections recent events have shown to be only too well founded. The duration of the flights made with dirigibles during the last couple of years have very greatly exceeded anything previously known; the Zeppelin (rigid) and the Parseval (non-rigid) in Germany, and the "Patrie" and the "Ville de Paris" (both non-rigid) in France, have shown that there is no difficulty in remaining in the air at cruising speeds for several hours, flights of about eight hours and upwards having been made with all these machines. The improvement in this respect is mainly due to the use of the modern rubber-proofed fabric. So perfectly is this material now manufactured that a balloon may be stored and retain its charge of hydrogen for several weeks.

AERONAUT FRANK W. SYLVAN

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Figures go to show that the area of the accessible coal fields of the United States, according to an article which appears in a recent issue of the Scientific American, comprises about 327,000 square miles; while their content available for future use approaches nearly 2,000 billions of tons. The rate of consumption cannot be predicted with certainty; but if the rate of increase which has held for the last fifty years is maintained, the supply of easily available coal will be exhausted before the middle of the next century.

This article is headed, "Coal fields of the United States—2,000 billion tons of coal available."