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SAFETY IN FLIGHT.

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Memorial Aeronautical  
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## SAFETY IN FLIGHT.\*

By Edward P. Warner.

In undertaking a discussion of this subject, it must be definitely stated at the very beginning that the danger involved in flying is far less than is generally supposed by those not connected with aeronautics. The prominence often given to accounts of fatal accidents, contrasted with the slight mention which a successful flight is likely to receive, has led many people not immediately in touch with the development of aviation to suppose that a large percentage of all the flights undertaken end in disaster. It cannot be denied, however, that this public impression as to possible danger, together with the knowledge of what danger really does exist, is one of the greatest obstacles that has to be overcome in persuading the lay public to take up flying for themselves. Sensational press accounts of accidents, combined with the regrettable activities of aerial acrobats and "wing walkers," are the strongest influences postponing the day when the airplane will be a generally accepted and widely used means of transport.

Since it is the fact that the fear of accident is a strong deterrent influence from the use of aircraft, it is very important that the real facts in the matter should not only be determined in such a way as to be available to the technical world, but also that they should be laid before the non-flying public in all possible completeness in order that they may furnish the ground for each individual to make his own decision as to the wisdom of flight for his own purposes. There has often been too much propaganda in

\*Taken from the Christian Science Monitor.

this,, as in other things, and propaganda is likely to mean that statements are made which cannot be justified, and which carry on on their face evidence of their own absurdity. The only propaganda that is required or permissible in this connection is a propaganda of facts presented without fear or bias.

#### Perverted Statistics Unnecessary.

Statements such as are sometimes made by enthusiasts, to the effect that airplane travel is now safer than railway travel or cheaper than railway travel, do more harm than good to the aeronautical movement, even when they are backed up by statistics distorted for the occasion in a manner, the obvious absurdity of which one need not be a statistician to recognize. It has been stated in print, for example, that the airplane is safer than the railway train, because the number of passengers killed on the French railways last year was much greater than the number killed on the French air lines, no account being taken of the difference in volume of traffic handled. Such perversions of statistics are unnecessary. The undistorted truth will serve all purposes.

#### The British Accident Record.

The facts are not difficult to obtain up to a certain point. The countries which have departments of civil aviation and which have acceded to the provisions of the International Air Navigation Convention compile and usually publish elaborate statistics on the amount of flying done, the paying traffic handled, and the number

of accidents. The British Air Ministry is particularly diligent in this respect, and has been publishing since the beginning of post-war civil flying a series of semi-annual reports on the progress of civil aviation at home and abroad. The latest of these to arrive in America carries the story to September 30, 1931, and is an exceedingly informing document. It is there shown that the total number of passengers killed in 29 months of civil flying has been 12, four of those fatalities occurring last year.

The statistics were originally presented only in terms of total accidents and of airplane miles and airplane flights a fatal accident. For the sake of more effective comparison, however, I have made an approximate reduction to terms of passenger miles. It would obviously be unfair to give no more weight to a safe flight of a 10-passenger machine carrying a full load than is given to a similar flight by a single passenger airplane, while the large machine is capable of causing ten times as many fatalities as the small one in case of a serious accident. Comparison on the basis of airplane distance or airplane time alone is therefore obviously unfair. A comparison in terms of the number of passengers carried is a little better, as most accidents occur either soon after taking off or shortly before landing, and there is not really one hundred times as much danger inherent in a 500-mile flight as in one of only five miles' distance unless the long trip is over abnormally bad country. Comparison in terms of passengers carried per passenger killed and passenger miles flown per passenger killed shows that the average figures during the whole duration of civil

aviation in Great Britain have been one passenger killed for every 11,900 carried and one fatality for every 385,000 passenger miles (it must be remembered that this last figure is approximate, the official data being incomplete in this particular.

Figures for the last year alone are somewhat better, showing an increase in safety. From Oct. 1, 1920, to Oct. 1, 1921, the fatal accident rate was one for every 14,000 passengers and one for 435,000 passenger miles, an improvement of about 15 per cent. During the last six months of that time, the corresponding figures were 31,850 and 1,200,000. These averages, however, were obtained during the summer months and must be considered as abnormally good.

In brief, it may be said that on the average there has been one fatality for every 400,000 passenger miles (roughly) flown in British commercial aviation. This includes all the commercial flying done within the British Isles, and the air lines from London to the Continent have, on the whole, had a record somewhat better than this average. During the first nine months of last year, in fact, nearly 2,000,000 passenger miles were flown over these lines, 9,200 passengers having made the journey, without a fatal accident.

The figures obtained for commercial operation in other nations are remarkably similar. In the French services there has been approximately one fatality for 350,000 passenger miles. One line has operated 400,000 airplane miles, probably correspond-

ing to more than 1,000,000 passengermiles, without any accident.

### Unregulated Traffic in America.

In the United States, a recent report of the Aeronautical Chamber of Commerce leads to similar conclusions, although the failure to pass any air regulation legislation in this country has made it impossible to collect complete and accurate statistics. It is estimated by the Chamber of Commerce that the aircraft engaged in civil flying in the United States traveled 6,500,000 miles during 1921. Allowing  $3\frac{1}{2}$  passengers on each flight (undoubtedly a conservative figure, as most of the machines being used for passenger carrying hold at least three persons) this corresponds to 16,000,000 passenger miles, in the course of which there have been 49 fatalities or one for every 325,000 passenger miles. The remarkable feature of this record is not that it is inferior to that made by the British and French, but that it is so close to them, as the lack of regulation in the United States permits anyone to solicit passenger traffic with any sort of an airplane that he thinks will hold long enough together to get off the ground and back again.

### Air Mail in Bad Weather.

The passenger services, of course, operate under rather favorable conditions on the whole, the desire to obtain safety leading to a suspension of service when the weather is very bad. As an example of what can be done when flights are carried out under

all possible conditions, in rain and in sleet storms, in gales and in fog, the record of the United States Air Mail may be considered. During the year ending last September, the same period for which the British statistics were analyzed, there had been one pilot killed (no passengers are carried) for every 170,000 airplane miles, one for every 230,000 in the last half of that year.

It is possible to say without the slightest hesitancy that the fatal accident rate on a regularly operating service running at not less than 94 per cent efficiency during the summer months and 80 per cent in the winter can be kept down to one fatality for every 350,000 passenger miles or one for every 15,000 passenger flights of the present average length. A concrete illustration of what this means will perhaps be obtained if it is stated that such an accident rate means that a passenger who made the trip from London to Paris every day for ten years would have better than an even chance of going through without accident.

Admittedly, this is not all that might be desired. The safety of aircraft travel must be increased and it has been shown that it is constantly being increased, but certainly the danger at present is much less than is popularly supposed and few travelers who know the real facts of the matter are likely to be dissuaded by the supposed danger from trying the trip across the English Channel or some other similar voyage by air.