

to be had have been accomplished at some great cost. The results produced have necessarily had to be the outcome of bitter and sad experience. The large death toll does not indicate the necessity of such, nor is it the result of scientific and careful aerial navigation. Judgment and prudence have not always been exercised when undertaking such a task; often rashness, impetuosity, foolhardiness and daring have been the cause of a great many of the accidents. Unqualified and unprotected ambition, guided only by the immediate end in view, with no precaution against the possibility of an accident: such has been the history in every incident, many fatal, which might have been avoided.

Until within a few years balloons alone were used to conquer the air. The principle employed was that of the relative lightness of the volume of gas used to the same volume of air. Annonay, in 1783, was the first place to witness a balloon ascension. A balloon forty yards in circumference was filled with heated air, and arose to a height of about one mile and a quarter. Since then ballooning has been greatly improved, hydrogen gas being used instead of hot air.

In the field of aerial navigation, Charles Gay-Lussac, Glaisher and Coxwell were the first to make successful flights. Others were Bleriot, Baldwin brothers and Lincoln Beachy, who today is the acknowledged king of the air. The principle is simple; one plane or two parallel planes with a vertical plane projecting behind as a rudder; the whole is driven by a large two blade propeller, having power from a gasoline motor. Aeroplanes attain a speed of seventy to ninety miles an hour.

The defect with balloons is the difficulty of applying horizontal force. Although in Germany, France, England and the United States dirigibles are common, one continually hears of an accident. Count Zeppelin, of Germany, has made the greatest advance, but four dreadnoughts have already been destroyed by explosions or otherwise.

In another two decades the aeroplane will be as common as the automobile today, and some other invention, possibly not yet conceived, will be in the industrial nursery, replacing the infant aeroplane, and will be as much of a source of awe to us as the aeroplane would now be to our great-grandfathers. Such is the course of the all-potential human activity.

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