

WHEN THE AEROPLANE DIVES.

It has taken a full century to dispose of the hallucination that there is dirigibility in the balloon, or gas-bag, as it is somewhat irreverently termed by the apostles of dynamic manflight, but its dethronement is at last complete, so far as being considered a factor in the working-out of the problem of the free navigation of the upper air is concerned. This must be apparent to any one who will take the pains to peruse the able review of the aeronautical situation from the pen of Johann Rudolph Zuberbühler, which appears on page sixteen of today's issue. Those who still hold to the hydrogen-bubble delusion are on a false scent, as they will discover sooner or later at the expense of their pride and their pockets. It is a most remarkable fact, however, that many men of scientific attainments have wasted time and money in illogical attempts to force the unwieldy bulk of the balloon in a given direction. In his article on page sixteen Mr Zuberbühler predicts that the aeroplane is the vehicle on which we shall career through the realms of air, the only drawback to immediate flight being the lack of a suitable aeropropeller.

He scouts the idea of a screw propeller such as has been adopted by Hiram Maxim in his very valuable experiments in England, for aeropulsion, preferring rather the Kress form, which he describes at length and with which he believes it possible to lift and navigate at will through the air an aeroplane weighing 1200 pounds, the motive power of which is a ten horse-power steam engine. As Mr. Maxim has achieved flight, according to report, with an aeroplane 140 feet long, 110 feet wide, and weighing 7000 pounds, with screw propellers, it will have to be admitted that, though this form may not represent the ideal propeller, it yet demands more consideration than Mr. Zuberbühler seems willing to allow.

As to the Lilienthal experiments, in which the flight of birds is imitated and upon which the writer bases his whole argument, though they demonstrate the possibility of manflight when carried on under perfect conditions, they are by no means conclusive, as the writer admits, and the mishap which befell the inventor the other day shows the crudeness, if nothing more, of his apparatus. Then, too, the question of equilibrium is carelessly brushed aside, when in point of fact it is the very pivot of the whole question of navigating the air by means of the aeroplane. The many new devices based on this principle could, undoubtedly, maintain their equilibrium under ordinary conditions, which is a distinct advance, but ordinary conditions are not what will be met with in the air. Lost equilibrium, to the aeroplane moving at great or even moderate speed through the air by means of any kind of mechanical propeller, means certain destruction, for the force which gives it motion and buoyancy will be the very power, to which the force of gravity will be added, that will dash it to earth.

It is not sufficient to argue that the spreading wings will always ensure a slow descent. The kite experiments at Blue Hill a short time ago demonstrated the theory that there were sometimes vertical currents of air of considerable strength was correct. These might not be strong enough to tip the aeroplane off its centre of gravity, but the breaking of one or more of the planes, however, would be fatal. Hence even with the ideal aeropropeller, the navigation of the air by aeroplanes depending on mechanical power alone for sustentation will be dangerous, though not perhaps impossible.

That is why so many have clung to the balloon, in which the power of sustentation is independent of mechanical power and the equilibrium can be maintained in spite of atmospheric conditions. Because of this, likewise, the vacuum theory finds many supporters among scientific men. In this case, allowing that a practical rigidity of the very thin steel envelope proposed can be attained, that rigidity would give the inventor a firm platform upon which to operate his propellers, the aforesaid rigidity of the structure permitting of its being forced through the air where the yielding, swaying gas bag could not be. The aeroplane is in fact a mechanical attempt to imitate the flight of sailing birds, but it should be remembered that the true method of their flight has never yet been discovered, much less explained, and that the problems involved in maintaining equilibrium instinctively solved by the eagle and hawk are still a puzzle to scientists.