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**THE SKETCH.**

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## THE ART OF FLYING.

Who that has ever watched the circling and darting of swallows, the swift swoop of the eagle, the tireless poising of the albatross, has not been filled with the vague desire to imitate them, recognising, however, that this most beautiful and useful of all arts seems to be the one unattainable by modern science?

And yet, as a distinguished professor said recently, “we have more intelligence than birds.”

It is evidently not intelligence that is so much in question in the matter of flying as the means required to sustain our weight in the

[Abbildung: Mr. PILCHER CARRYING HIS MACHINE.]

atmosphere, and from the earliest times ambitious mortals have been endeavoring to imitate the creatures of the air.

The story of Icarus shows, at least, that the problem had preoccupied the minds of the ancients; but the first authentic instance of a man flying seems to be that of a Saracen, whose name has not been handed down, who, in the presence of a large assembly at Constantinople, in the year 1178, took a short aerial journey in a machine, but soon losing his balance fell to the ground and received severe injuries.

Towards the end of the fourteenth century, a mathematician bearing the name of Dante succeeded in soaring over Lake Trasimene, but on a subsequent occasion fell in the public square of Perugia and broke his leg. Paul Guidotti, an artist born in 1569, constructed a pair of artificial wings which enabled him to soar with some success, but ultimately he also fell and broke his leg. In 1863 a Spanish peasant named Orujo invented an apparatus with wings which carried him along in a gale of wind, like a huge grasshopper, with considerable velocity.

In 1867, Captain Le Bris, a French sailor, obtained a certain success with a flying apparatus, but like all his predecessors he finished up by injuring himself.

And now at the present moment we have a number of enthusiastic aeronauts quietly flying in various parts of the world-England, Germany, France and the States.

Professor Langley, in Washington, has constructed an apparatus which resembles the earliest-known form of steam-engine, namely, that

[Abbildung: THE WINGS EXPANDED]

exhibited as a toy to King Hero. Professor Langley did not ascend in his own “aerodrome,” but it is satisfactory to know that his machine careered gracefully through the atmosphere at the rate of twenty miles an hour.

Mr. Hiram Maxim's flying machine is fairly well known to the public. It may be roughly described as like a canvas tent drawn upward and onward by the force of screw propellers worked by steam. The actual machine weighs over four tons, and the engines are capable of exerting 360 horse-power. In the experiments hitherto shown to the public the machine has been kept from rising by means of iron rails, against the undersides of which the wheels of the apparatus pressed.

In France experts are occupied mainly with the problem of navigable balloons, and it is to Germany we must go to find the best example of a “natural” flyer. This is the famous Herr Lilienthal, a manufacturer of steam-engines in Berlin, who has betaken himself to his hobby of flying with true Teutonic thoroughness. Herr Lilienthal imitates the butterfly. His wings are genuine wings, made by stretching a kind of light calico over a bamboo framework. His arms are inserted into a couple of leather collars, and he grasps a horizontal bamboo stick on the frame with his hands. His legs hang, and he moves them slowly and gracefully to secure a proper balance.

Lately Herr Lilienthal has done great things. He has built a sort of pyramid about fifty feet high, and from the apex of that structure he

[Abbildung: RISING IN A HEAD-WIND]

commits himself to space and the mercies of head-winds. The longest flight that he has been able to record is about two hundred yards in horizontal distance from his starting-point; and on the other side of the ledger he sets off, resignedly, a broken wrist.

In the later forms of Herr Lilienthal's apparatus he has arranged a very extensive sail-area over the “true” wings, and has provided himself with a rudder, with horizontal and vertical faces.

Mr. Pilcher, assistant to Mr. Hiram Maxim, is probably the most enthusiastic flyer in this country. His machine is constructed somewhat after the fashion of Herr Lilienthal's, except that he distrusts the upper sail-area in the variable and puffy winds of these latitudes.

Mr. Pilcher's wings are curved like those of a locust, and the apparatus is provided with a rudder of vertical and horizontal circular planes. The wings of the flying-machine are made of a light calico material, called “nainsook,” stretched over a light wooden framework guyed and held with piano-wires.

Most of Mr. Pilcher's experiments have been made at Cardross, in Dumbartonshire. The aeronaut had found there a very convenient grass hill, with a slope towards the prevailing wind, and it was his custom to run a little down the hill and then leap into the air. He then soared gracefully and slowly – downwards.

Mr. Pilcher's machine weighs about eighty pounds, and it has a sail-area of about one hundred and seventy square feet. Against a head-wind, and in the air, the apparatus is fairly comfortable, when once

[Abbildung: HERR LILIENTHAL IN THE AIR.]

the terrible secret of balancing has been learnt. But when the wind shifts, or when the wings fan along the ground and force the experimenter to run like an exaggerated ground-lark, the pleasure is much qualified.

Mr. Pilcher's machine is on view at the Imperial Institute, and perhaps his example may lead to fashion in this highly interesting form of sport. The utility of these experiments will probably be one day strikingly apparent, for there are a number of experts – men of genius, some of them – who are working on allied branches of the great problem of aerial navigation. Most of them hope that ere the century closes we shall have added to our resources that most attractive faculty.

ARTHUR LYNCH.