The Fusion Watershed Event

After the first successful controlled fusion plasma ignition at the National Ignition Facility at Lawrence Livermore National Laboratory on December 5th[1], we're no longer living in the same world that we had thought we inhabited three weeks back. All of the immediate possibilities are different—and much improved over what they had been. Even all of us who have fought for decades to bring forward the fusion economy anticipated by visionaries such as Lyndon LaRouche[2] have not yet fully grasped the change. Really the only comparable revolution in human history since the advent of steam power is that associated with the development of human flight. And it's worth taking a look at it to gain some insight into where we are going.

A hundred-and-twenty years ago, in 1902, there were handfuls of dreamers and experimenters trying to figure out how people might take wing. Many other seemingly miraculous human powers and capabilities had recently been developed—why not flight?

A flight of Otto Lilienthal on his artificial hill, June 29 1895. Public Domain

A German experimenter, Otto Lilienthal, had died in 1896 when his glider had stalled and crashed during a flight. But the images and stories of the hilltop jumps he survived had sparked an awakening of possibilities around the world—but especially in France and the United States. It seemed that success could not be that far off, yet all the early attempts bore more similarities to leaves falling from trees than to controlled flight.

In particular, Wilbur and Orville Wright, whose bicycle business already revolved around questions of balance, tension, and compression, thought that they could take a stab at the problem. Through a multiyear process, they collected all the purported knowledge which then existed on the subject, proposed some solutions to known problems, and then began to test in 1899. They soon discovered that a great deal of what had been previously written down as "knowledge" was quite incorrect. Both in the field at Kitty Hawk, and back in the workshop in Dayton, they systematically tested every hypothesis they could in order to systematically find each best next step forward.

The big hurdle was control[3]. Early on they had developed an elevator to control pitch, and in favorable conditions their gliders could travel a fair distance downrange, but any gust of wind could come along, induce uncontrollable yaw and easily twist their flight into the ground—and possibly kill the pilot.

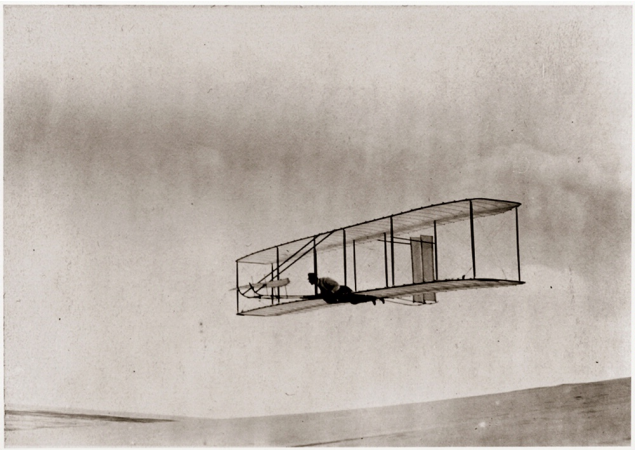
One night in 1902, as Orville lay awake pondering the control problem, he came up with the idea of replacing the fixed rudder configuration with a movable rudder which could turn to the left or right to compensate for uncontrolled yaw. Next morning when he discussed the idea with Wilbur, Wilbur suggested the further step of connecting such a movable rudder to the wing warping system (the

[1]https://www.larouchepac.com/the_national_laboratories_a_place_for_team_science_and_fusion_discoveries

[2]https://www.larouchepac.com/eureka_fusion_ignition_now_let_s_realize_it_in_a_crash_program

[3]https://www.wright-brothers.org/History_Wing/Wright_Story/Inventing_the_Airplane/Wagging_Its_Tail/Last_Piece_of_Puzzle.htm

system controlling the lift and roll exerted by the wings on either side of the glider) in order to simplify control by the pilot. Thus the simple system to control the three axes (pitch, roll, and yaw) of movement in flight was created. This insight was a spectacular success. And the movable rudder, which had been created simply to prevent unwanted yaw, also facilitated intentional yaw, so the glider could now turn! Suddenly the pilot was put in complete control of every aspect of flight.



The 1902 Wright glider on one of its 700 flights. This picture shows the craft before the rudder modification described here. Credit: Public Domain

Before 1902 dreamers had put forward all kinds of quirky ideas about human flight, and dreamers had whole societies of detractors. But in 1902, everything changed.

Today, everyone remembers the Wrights' first powered flight by a heavier than air vehicle from level ground in 1903. But the breakthrough occurred in 1902. In 1902 the principle was proven that man can engage in flight that responds to his will—and not the wind. Once the control problem was solved, the brothers knew that they could build a powered airplane. After 1902, all subsequent flight problems became merely solvable engineering problems. The first human supersonic flight (1947), first artificial Earth satellite (1957), first person in Earth orbit (1961), first person on the Moon (1969) were all directly born of that 1902 seed. Indeed, the time between the proof of principle and the first walks on the Moon was only 67 years!

Such is the situation today with the December 5th fusion breakthrough. Cracking the civilizational controlled fusion power question has taken many multiples more time and effort than that expended by the Wright brothers. Indeed, it is a much more difficult problem to solve. Neither birds nor insects have built their own fusion power sources. And the difficulties, the time and effort involved to make the breakthrough, have given a wide field for the Empire, the detractors, the naysayers to suppress our work. But just as 1902 marks a huge divide in history, so now 2022 marks a huge divide. Now we know that we can get more energy out than we put into a controlled fusion reaction. It is no longer a hypothetical; it is a reality.

Now, every engineer, every national government, every company and startup, every investor with the means to participate in the flowering of the seed of 2022 will be at it. Putting our national resources behind an Apollo style crash effort to grow the seed and bring fusion power to the people[4]—both through direct governmental efforts, and by making cheap national credit available to industry—must become a primary objective of the second Trump administration.

[4]https://www.larouchepac.com/we_have_ignition_at_the_threshold_of_fusion_energy