SPINS WERE A ONE TIME THING IN 1914©

An unheralded aviation pioneer is, British scientist, F. A. Lindemann. "The Prof", as he was known, led a very checkered scientific and social career from early WWI through WWII. He was an "idea man" and advisor to Churchill for thirty years. He was a social butterfly and a boastful scientific gadfly in the opinion of more capable scientists. However, his place in history could well lie in aviation and you never heard of him?

Born of German/American parents, he spoke heavily accented mumbled English. He knew all the "right" British nobility and used their influence to gain both position and prestige. In 1914 he attempted, but failed because of eyesight, to join the Royal Flying Corps. He then used influence to join the scientific staff of the Royal Aircraft Factory.

In 1914 the "spin" was the most dreaded unintentional flight occurrence which resulted in accidents. More to be feared than the more frequent landing accidents. At least, landing accidents could be explained. Once an aircraft was in a spin there was no way out of it. The spin turns would increase in speed until the ultimate crash. All flight instructors warned, "Get into a spin; get killed". Lindemann initiated a study of the instrument readings and pilot procedures that seemed to cause the stall/spins occurring during turns.

A letter to his father said, "Nobody can make out quite what happened." Lindemann could find no apparent pattern as to when a stall or a resulting spin might occur. A British naval pilot was said to have recovered from a spin. If not known if Lindemann used this event to develop an explanation, a theory, about spins. While never publishing his study results, Lindemann gave many oral accounts of his findings.

The spin frequently occurred when the aircraft stalled in other than an absolutely level condition. If one wing dropped any effort to raise it would cause the other wing to flip over uncontrollably. Even at high speeds, a tight turn might cause one wing to flip over and cause a spin. Without any flight skills, Lindemann had worked out in theory the probable forces which caused and existed in a spin. He also figured out, in theory, the control movements required to counteract these forces.

His study showed that any instinctive response would not work. The rudder must beheld fully against the spin while the nose was kept pointed toward the ground. You could not pull back on the stick until the spin stopped and flying speed was gained. His theory also seemed to indicate that during the recovery the wings of the plane could be pulled off. The way Lindemann used to test his theories was somewhat akin to a medical researcher doing a self inoculation for a deadly disease.

He insisted that further study to prove the theory required that scientists fly. He worked through and around the bureaucracy, used influence, memorized the eye chart for his "blind" eye and learned to fly "poorly". One 1914 flight of uncertain date justifies Lindemann's place in history. One Fall day, he discussed his theories on spin recovery and the planned experiment with observers at Farnborough Aerodrome. He would be using a B.E.2 aircraft of most uncertain flight characteristics. The fragile airframe was held together by a maze of wires and struts that maximized a power off vertical speed of about 90

mph. He told them he would deliberately do a stall spin. He certainly must have said his good-byes. He departed and climbed for many minutes. Far below, the observers saw him reach what must have been the B.E 2's service ceiling of 14,000 feet. They saw the spin well before they heard the cessation of engine noise.

Lindemann now began to test his theory. He pulled the power, slowed the plane and entered into a stall. He held the stall until the left wing dipped and the right wing flipped up for the spin entry. A deliberate entry into a maneuver from which no one had previously recovered and few had survived. A maximum test of accountability and courage.

Lindemann held the spin, intentionally or otherwise, until it was fully established and then he initiated his unique recovery. A planned application of control forces never before applied. He put in full opposite rudder. Nothing happened. He waited. Still nothing happened. He applied forward control pressure. He had already fallen thousands of feet with no control effect discernible. Was his theory going to fail at this critical moment? But the rudder was starting to have an effect. The spin was slowing and finally stopped. From the vertical, but without the spin Lindemann now had to complete a recovery. Survival demanded that the pull out would not remove the wings from the fuselage. Slowly, carefully the nose rose and as it rose the aircraft slowed thus easing the stress on its components. The first intentional spin and recovery. All that and survival. Enough?

One such experiment and proof would have satisfied most people, but not Lindemann. He climbed back up to altitude and did the spin and recovery in the other direction. A theory twice applied and proven to be a life saver. From that day on, a pilot's education has not been deemed complete without spin training. (Except, of course, in the U.S. by the FAA).

The British had a military secret. It combined two of the very best qualities of military combat. Deception and survival. A British pilot, when out-numbered or fearing for his life, could deliberately enter a spin. To the enemy such a maneuver was not survivable. The Germans would circle and wait for the inevitable crash of their 'kill'.

Imagine their chagrin, when the British plane would level out close to the ground and scoot to safety. Indeed, the spin was often used in WWI as a deliberate escape maneuver. I wasn't long before the Germans discovered the deception and began to follow spinning planes all the way to the ground. It is not known how the Germans gained the secret of spin recovery. Pilots are known to brag about their flying exploits while talking flying with other pilots.

Most great aircraft flights recorded in aviation history are about distances, speeds and kills. Why not a special "save" category for Lindemann along with Immelman? But again, wouldn't your entering his name into your memory and applying his theory and practice to your own "Lindemann" spin recovery be sufficient.

An aside: In WWII Lindemann served as Churchhill's scientific advisor. He stood alone against all other British scientists in his contention that the greater military potential lay in infra-red than in radar. He lost the contest in WWII and radar saved Britain. In 1990, Lindeman was partially vindicated. Desert Storm would not have been possible without infra-red. A little known man of his time and ahead of his time.

Pattern Spins

The main reason the FAA no longer requires spin training is because the base to final turn is too low to make a spin recovery. The cure is in learning to do ground reference. In ground reference you learn to adjust your ground track to the wind conditions.

The hazard of the base to final turn occurs when the wind is blowing across the runway in a direction that makes you have a tail wind on base. Drawing it out is the best way to see what occurs.

If the pilot fails to adjust the downwind leg wider for this crosswind and flys a normal pattern he is getting into trouble. Most pilots do not realize the amount of information they get from their peripheral vision. A pilot who has not flown a wider downwind then makes a normal turn to base 30 degrees and 70 knots is ripe for trouble. While in the turn to base, the peripheral vision gives the sense of a significant increase in ground speed due to the tail wind. The pilot raises the nose to slow up. This can greatly reduce the airspeed say as much as 20 knots.

Now, because of the closer downwind pattern, the tail wind has made the base leg significantly shorter in time. Fearing that he/she may overshoot the runway (worse if parallel runways) the base to final turn is made with greater bank. This turn is often made with excess rudder to get the nose around more quickly.

The triple combination of a relatively slow airspeed, steep bank, and excess rudder is all it takes to initiate a spin. Again, the root solution lies in referencing your downwind ground track far enough from the runway to allow a longer base leg with more time to lead the turn to final.