



SOARING Rx

BY DR. DANIEL L. JOHNSON

Break-Off

*Oh! I have slipped the surly bonds of earth,
 And danced the skies on laughter-silvered wings;
 Sunward I've climbed, and joined the tumbling mirth
 Of sun-split clouds, – and done a hundred things
 You have not dreamed of – Wheeled and soared and swung
 High in the sunlit silence. Ho'ring there
 I've chased the shouting wind along, and flung
 My eager craft through footless halls of air...
 Up, up the long, delirious, burning blue
 I've topped the wind-swept heights with easy grace
 Where never lark or even eagle flew –
 And, while with silent lifting mind I've trod
 The high untrespassed sanctity of space,
 Put out my hand, and touched the face of God.
 High Flight – John Gillespie Magee, Jr*

In 1957, Clark and Graybiel reported that many military pilots flying at high altitude had a feeling of isolation, detachment, or physical separation from

the earth. They coined the term, “break-off” for this experience. Since then, this term has been used for any analogous experience in which a pilot feels a sense of dissociation from solid reality.

A typical experience is one like John Gillespie Magee’s, which inspired him to write the famous poem, High Flight, printed at the head of this column. I’ve boldfaced the first and last lines, which epitomize the sense of “break-off.”

Other pilots have more dramatic experiences, such as the ‘out-of-aircraft’ sensation of an RAE fast-jet pilot, who reported that he was at a high level when he suddenly had the feeling that he was outside the cockpit, sitting on the wing, and watching himself fly the aircraft.

Fortunately, he didn’t jump off the wing. The authors don’t tell us how he re-entered the cockpit to re-join himself.

Break-off is not a mental illness, nor is it delusional. Break-off is usually, but not always, experienced by single-seat pilots operating at high altitude and with low workload, such as a long-range transit flight with little to do. The lack of a well-marked horizon and the deep-blue sky above are other factors. According to the RAF Institute of Aviation Medicine, about two-thirds of the pilots who experience break-off are not particularly bothered by it. Some

enjoy the sensation of remoteness from the world, citing it as one of the pleasures of flying, but a third find the experience disagreeable.

Some say that they experienced a feeling that the aircraft was balanced precariously, “on a knife edge” or “on a pin head,” and could easily “fall out of the sky.” This might be frightening, if the pilot feels the aircraft could become uncontrollable.

Break-off is, as we say, “within the very broad limits of normal,” but if the pilot finds it noxious, it can lead to a fear or dislike of flying at high altitude.

The break-off sensation can be interrupted by redirecting the pilot’s attention to something as simple as a cockpit check or a radio call. (Without stimulus, the mind wanders.)

It’s probably related to break off that some pilots report periods of great loneliness when flying solo at high altitude. William Bridgeman, who flew the Douglas Skyrocket, the first pilot to reach mach 1.7, wrote a biography in 1955 of his test flying titled “The Lonely Sky”. (A very well written book, lyrical and interesting.)

Clark and Greybiel quote a paragraph from Bridgeman that exemplifies their definition of break-off: “Fifty-nine thousand, sixty thousand, reeling off sixty-one thousand. I have left the world. There is only the ship to identify myself with, her vibrations are my own, I feel them as intensely as those of my body. Here is a kind of unreality mixed with reality that I cannot explain to myself. I have an awareness that I have never experienced before, but it does not seem to project beyond this moment . . . And with this adrenalin-inflicted state floats the feeling of detachment.”

This column has been dedicated to showing you the many ways in which a skilled, well-intentioned pilot can wander into an accident. We are tripped up by our assumptions about what the air is doing, by the invisibility of turbulence and shear, by presumption about what other pilots will do, and faith in the accuracy of our (sometimes poorly maintained) instruments. We regularly misperceive distance, shape, motion, and orientation due to the limits and operating characteristics of our senses and our perceptions.

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We fly most safely when we continually are ready to be wrong – this is not a lack of confidence, nor is it safe to be indecisive because we might unknowingly be wrong. We simply need to have that little, quiet advisor standing beside the director's chair in our brain, saying, "What will you do next if you're wrong?" or "Here's something that doesn't fit; let's re-think the situation."

I'm not aware that break-off has ever caused an aircraft accident – perhaps partly because it tends to happen at high altitude, where there's lots of space to recover from an upset and no conflicting traffic – it tends to be more likely when things are boring.

On the other hand, break-off and the giant hand phenomenon are considered by accident researchers to be types of spatial disorientation, and thus are risks for accident. A very nice definition of spatial disorientation is "An incorrect perception of linear/angular position, or of motion, relative to the Earth's surface or another aircraft, *sufficient to affect performance, situational awareness or workload – however slight that effect may be.*" (Matthews, Previc & Bunting; their survey of about 2600 military pilots found that a feeling of detachment was an unusual experience, noted by just over 10%.)

On the safe side of soaring, perhaps we can count break-off and its variants among its many pleasures. When I began soaring, my only goal was to float mindlessly under the cu and take in the view. It was a brief, poignant disappointment to discover just how much learning, planning, and work are necessary in order to possess those occasional fleeting minutes of aeronautical nirvana, the "No worries, mate" moments.

Then I discovered how much delight is encompassed in learning about aerodynamics, weather, technique, navigation, and cross-country performance; mindless pleasure was no longer the goal.

I don't know whether break-off is related to other out-of-body experiences. I'm pretty sure it's not a near-death phenomenon, though with both, people tend to talk only about their pleasant visions. There's no point in frightening the children.

This column is much shorter than usual, for break-off can be described succinctly, and I don't have time this month

to pick the brains of fellow pilots or to write a long, deeply-researched piece, due to extensive new responsibilities at work.

I do wonder whether you have experienced break-off, and what were the circumstances.

References

Bridgeman, William and Hazard, Jacqueline: *The Lonely Sky*. New York, Henry Holt, 1955.

Clark, Brant and Graybiel, Ashton: *The Break-off Phenomenon: A Feeling of Separation from the Earth Experienced by Pilots at High Altitude*. Journal of Aviation Medicine, V28#2, April, 1957.

Matthews, Roger S.J.; Previc, Fred; Bunting, Alex: *USAF Spatial Disorientation Survey* (available via Internet search) 

