



## Advantage gorilla. Murray to serve

**Anthony Preston** on conditioned reflexes, why we need spin training, and the gorilla on Centre Court that wasn't there

STRANGE to imagine being enraged by one's own feet, but here I am, gazing down at them in disbelief, cursing. It isn't that they're tripping each other up, more a matter of having their own mind: dancing when commanded to stand to attention.

Let me explain: I was testing a new Shadow for CFM Aircraft at Parham airfield in Suffolk. Except it was no ordinary Shadow. It was destined for APT, Aviation for Paraplegics & Tetraplegics at Old Sarum, a charity providing bespoke aircraft for the physically impaired.

There were no rudder pedals. Yaw control was achieved by a modified throttle lever: fore and aft for power, sideways for rudder, so my feet had no idea what was expected of them.

Surprisingly, after a careful introduction, I found it quite natural and preferable even to foot pedals.

The problem lay in the hidden depths of the footwell. With each application of roll right using the stick and coordinated throttle, my foot on that side followed slavishly, reaching forward into space, groping toes pointing like some floating ballerina's.

Similarly, the new microwave in my kitchen provides a reminder of the contest between thought process and conditioned reflex. To open the door of its predecessor, I had to operate a slide for the catch to release. Now with a simple pull on the door, it obligingly opens, unhindered.

Unfortunately, the former action has been subjected to sufficient training to be consigned to the cerebellum, home of the

conditioned reflex: it has become involuntary, swift and without conscious thought.

Thus the pilot-cum-chef ends up with chafed nerves during adaptation to the new, my finger groping with futility for an absent catch. Old dogs, new tricks.

Just as I scowl at the hand as it behaves stupidly, so, with some admiration, I watch my hands and feet in the C42 spring to action when instructor input is demanded in moments of crisis.

Those hands, leaping to throttle and central stick, move too fast to be mine. My conscious mind can't keep up. Disembodied limbs do their involuntary thing, to the astonishment of their detached observer.

Here lies further evidence of the division of labour in the skull.

An instructor also becomes a psychoanalyst, discovering how learning is acquired in different ways. It may come as no surprise to find that those who think more, who find complexity where simplicity suffices, take longer to learn. Age doesn't hinder learning through slower reactions or failing judgement so much as through the desire to comprehend. Older students insist on ▶

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**Above left** I can't believe they missed me – and Harvard students, at that

**Right** Andy realises that the gorilla's just drunk all his barley water

## “ Any gorilla that decides to stroll across Centre Court has no hope of being seen by Andy Murray ”

▷ explanations, whereas the young, driven by youthful enthusiasm, take things for granted and get on with the job.

Theory is for the classroom. It feeds the cerebral hemispheres, at odds with hands-on practice. Learning by rote can't be avoided, but beware the danger of allowing conscious thought to occupy space better devoted to the cultivation of instinct.

Of the five written exams to be passed on the way to an NPPL, the easiest is HP&L. Yet you could argue it's the most important.

It gained the Limitations bit from a recognition that human factors alone don't give sufficient emphasis to the shortcomings of man as bird.

Before we can begin to learn something of birds' astounding capacity for flight, we must start with how the human brain works. How does it differ from birds at a fundamental level and what does it lack? What limitations should we fear?

In our evolutionary journey from ape to man, we have developed far beyond any other mammal in brainpower, but with that growth came both benefits and obstacles.

We gain thinking power, but at the expense of speed of reaction. Recent research reveals the working of the normal brain in conventional tasks and how, with time, we can train it to deal with the unconventional, leading us closer to being equipped like a bird.

Size, for a start, can't be ignored. Nerve signals take less time travelling to and from a tiny brain to tip of a feather than from massive brain to tip of a toe.

We find our first unconventional challenge on the tennis court. When Andy Murray faces a ball approaching him at over 100mph, his conventional brain is incapable of reacting with sufficient speed to get the racket to make contact, let alone at the precise angle required. But he does, and the angle is spot on. Despite the limitation, he can, by hours of training, overcome it through developing a conditioned reflex, bypassing the thought process.

You may recall the invisible gorilla experiment ([theinvisiblegorilla.com/videos.html](http://theinvisiblegorilla.com/videos.html)) which showed how the brain's management system works on the elimination of the irrelevant.

Students at Harvard University were asked to watch the video of two teams passing basketballs to each other, and asked to count the passes by players in white shirts. Half of them counted the passes and missed the man in a gorilla suit wandering across the scene and stopping to beat his chest.

The brain's management system, the thought processor, had filtered out the irrelevant and had prioritised to facilitate the counting task.



Bev Peake with the Mid-Anglia Microlights C42

It's estimated that, on average, every second of brain activity is 95% cerebellum and 5% the massive cerebral hemispheres. In other words, 95% is subconscious, 5% reasoning.

If Andy Murray can train his brain to rely upon total 100% commitment from his subconscious, he stands a better chance of being quick enough to intercept the ball and strike it where he wants it to go. Any gorilla that decides to stroll across Centre Court has no hope of being seen by Andy Murray.

The ability to train the brain is in all of us, but to varying degrees. We rapidly acquire skill-sets that become so well engrained that crossing the Channel into France presents no more fears than changing to a left-hand-drive car on the right-hand side of the road. I remember in Nigeria how overnight the rule of the road changed from left to right. There were few accidents reported.

However, can the same assumption be made about flying a microlight? Is there a difference of which HP&L should make us aware?

One day at Cromer International Airport, our gaze idly wandering from the veranda in front of the diner; feet up, shooting the breeze, we saw a weightshift lurch gaily into the crop to the left of the northerly runway, where it quietly crumpled. It was so determined I decided it was deliberate, but no, it was a classic case of pilot error.

The young, talented pilot regularly flew both weightshift and three-axis, and until that moment, had shown himself able to transfer seamlessly from one to the other. In his head resided skill-sets unique to both; secure, compartmentalised, instinctive. Yet one important ingredient was lacking: not enough time devoted to isolating each one to the extent that none other existed. That's how discrete each has to be.

Observing your hands responding faster than your thoughts clarifies that their action is beyond the latter's control. The central processor is not in the loop.

We have students who swap mid-course. You sympathise with the struggle to forget in order to learn. You ask yourself how well they will have absorbed adverse foot control on the ground and adverse pitch control in the air, through total, mutual isolation.

There are other ways to enhance the brain's ability to set up a number of discrete skill sets, apart from regular replacement of your microwave. Alternating from manual to automatic, from car to motorbike and from tricycle undercarriage to taildragger; so long as all are practised separately and with regularity, will lead toward compartments in the brain that won't overlap.

An instructor like Mid Anglia Microlights' Gary Taylor has no more difficulty swapping from weightshift to three-axis than from one helmet to another. His mindset for each is unique and reliable. He can change from one to the other several times in a day without giving it a thought.

By now it may be agreed that appropriate, disciplined practice is the only route to competence, and overall pilot competence is the best investment in safety.

How then does HP&L deal with a lethal hazard where practice and even tuition are denied?

Most fatal accidents, through loss of control at low level, result from brutal aircraft contact with the ground. It might seem, therefore, that HP&L would concentrate most on immediate causal factors, but it doesn't. It brushes aside material circumstances in favour of lesser evils, like pilot fatigue or hubris: contributory, perhaps, but not necessarily terminal.

More importantly, it doesn't prepare ourselves for a danger of which we are only too well aware.



I refer to the spin. It's as if pretending it can't occur ensures it won't occur. It's as if by saying microlights don't spin, they never will. Who ever saw an albatross or a seagull in a fully developed spin?

As an instructor I get asked: "How do I recover instantly from a spin when all I have under my belt is Exercise 11?"

A spin can be tamed with ease, but only after benefit of tuition and practice in recovery.

When demonstrating slow flight and incipient spin, the best the keen instructor can do is choose a benign trainer that's known to be spin-resistant like the Ikarus C42 or CFM Shadow.

Exercise 10a in the BMAA NPPL syllabus, slow flight, will allow a fully stalled condition, stick back to the stop, with wings maintained straight and level, by rudder control alone. The experienced instructor undertakes the demo without a qualm, knowing it provides convincing evidence of the need to avoid aileron input: how the latter exacerbates the problem, and why.

However, he is well advised to avoid this extreme and must prohibit his student from attempting it when solo.

The reason is that the yaw must be precisely and instinctively disciplined: correction applied with the speed of reaction of a racing-car driver catching sudden oversteer.

The danger is in overcooking the correction: whipping into yaw (or steering lock) in the opposite direction. It calls for sensitivity, anticipation and conditioned reflex. You can only arrive there through practice.

The sudden wing drop, which results from misuse of roll or incorrect yaw, has no fear if the pilot knows instinctively how to recover from the ensuing spin. If he's only flown microlights, he lacks experience in recovery. He may know it in theory, but theoretical knowledge falls far short.

Placing our trust in Exercise 11 isn't enough. The BMAA syllabus requires practical training in spin identification and instant recovery; telling the difference immediately between spiral dive and spin.

What's the answer? How about some form of dispensation that allows a selected microlight, identified to have aerobatic capability, viz TLAC's Sherwood Ranger, or an adapted C42, in which a BMAA-appointed specialist teaches spin recovery, at various stages, to a standard of proficiency defined in F102M?

The spectre of the spin, shrouded in mystery and feared by many, has to be exposed as the fraud it is, through mastery.


Mastery can only be gained through tuition and practice. Fear of flying is rooted in the unknown. Not only does the spin-conscious aviator become, justifiably, more confident in him or herself, but also their future as a pilot blossoms.

One of my students, Bev Peake, took his friend Hazel Ward-Smith up as his first passenger after qualifying, and she returned with a happy smile.

As Bev said: "She was so thrilled that she couldn't stop talking about it!"

As she gets to know more about her intrepid birdman, realising how his skill increases with each encounter with the sky, and how she begins to fancy following in his steps, so she realises that the unexplored envelope demands attention. It's in their best interests and those of all microlight pilots who have yet to enjoy a spin or two.

Exercise 11 primes the thinking processes; the theory. It neglects what really matters: the marshalling of the forces of unthinking, the conditioned reflex, the resource that can only be acquired through hands-on practice. □



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