

Do you own a cat?

Are you one of those pilots who gets kicks doing wingovers, perhaps PG tumbles or HG loops?

Have you been blown back off a ridge a few times, how many times have you had a mishap or injury due to flying?

How many times have you paid a speeding fine, busted a red light or accumulated too many demerit points?

Then you need to ask yourself: Is your cat controlling your brain?

by Rob Holmes

UK New Scientist magazine is often a source of stories picked up by the popular press – particularly ones likely to rouse reader curiosity. A perennial story that is definitely on the quirky side has recently been doing the rounds. This is about a cat/mouse parasite that falls into the weirdness of psycho-parasitology.

Before science had yet thought of such a category (excuse the pun), science fiction writer John Wyndham, famous for his 1950s novel 'The Day of the Triffids' predicting genetic engineering, also wrote the very chilling 'A Scent of New-Mown Hay'. The story is about a bloke who has a strange fungal infection. He develops an overwhelming urge which in the end takes over completely, compelling him to find an exposed hilltop, which is where the story ends. In his last hours, he climbs up the highest and most exposed hill he can find, spreading spores to the wind from fruiting bodies sprouting from his dying body.

Rabies has commonly been regarded as an infection that drives its victim 'mad', causing it to randomly bite other victims – of course the bite is infective, causing a canid victim to bite other canids (foxes or dogs) or more unluckily, a human. What happens is that the rabies virus takes control of the dog's brain – hunting and aggressive behaviours are explosively released, ensuring the dispersal and survival of the virus. The infection even gives the host an aversion to water or the ability to swallow its own saliva – hence the symptomatic 'foaming at the mouth' that increases the probability of the infection reaching the next victim.

A perusal of the scientific literature reveals an abundance of similar behaviours where the parasite commandeers its host's brain, causing

the victim to either commit suicide or behave in a way that benefits the parasite against all the self-preservation mechanisms that evolution has instilled.

There is the fungal-infected grasshopper that is compelled to climb, as in the Wyndham story, to die while clutching the top of a grass stalk, spreading spores from erupting fruiting bodies to other grasshoppers. The lancet liver fluke induces suicidal behaviour in any ant it infects, making it climb to the top of a blade of grass and hold on tightly with its jaws until it is eaten by a passing cow, thus completing its life cycle.

Then there is the subject of this story, the cat/mouse parasite; a single-cell protozoan called *Toxoplasma gondii*. Its adult life is spent in the gut of a cat, then spreading to a secondary host, a mouse or rat via cat droppings. What is especially creepy about *T. gondii* is that invaders like *Toxoplasma*

species get engulfed by white blood cells that would normally chew them up. In the case of the *T. gondii*, the white blood cell is hijacked, making its way to the brain of its host. The infected mouse becomes fearless – an unusually bold mouse being more vulnerable to being caught and eaten by another cat and so completing the life cycle. Studies have found that infected mice even find the odour of cat urine attractive.

This weirdness got scientists thinking of other possibilities other possibilities: Might *T. gondii* have some effect on humans? Worth considering since cats are such popular pets...

Most people infected by *T. gondii* don't ever feel ill or even know that they have an infection. It enters a latent phase forming tiny little cysts, mostly in the brain – sitting dormant, perhaps for years, apparently doing nothing until woken, and deciding then is the time to be eaten by a cat. Except in this case, the host is a human, not a mouse.

An assessment of almost 1300 US students has found that those who had been exposed to the parasite – as evidenced by *T. gondii* antibodies, and invariably cat owners – were 1.7 times more likely to be majoring in business. In particular, they were more likely to focus on management and entrepreneurship than other business-related areas.

Other studies showed that men infected with the protozoan were more likely than uninfected men to disregard rules, or to be excessively suspicious or jealous. Also, infected men and women were found to have significantly delayed reactions compared with uninfected individuals. Car drivers and pedestrians injured on city roads were more than twice as likely to be infected as a comparable group of people living in the same area. As in mice, the parasite appeared to be linked with reckless behaviour. The finding, which has since been replicated by various scientific groups, has encouraged others to question whether *T. gondii* is more harmful to humans than previously imagined.

All this had me thinking: why not paragliders and hang gliders? I know a lot of paraglider pilots who do things I would never consider and occasionally we hear of either serious accidents or fatalities – leaving me wondering, why they would have got themselves into such a situation?

Perhaps they own a cat... 🐾

