

An Introduction to Vertigo

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It's often been said that it is difficult to argue with the laws of physics at 30,000 feet. It is even more difficult to argue with them if the plane that you are in you are in describes a perfect parabola, allowing you to experience 30 seconds of microgravity, sandwiched between two sections of double gravity, and then does it again and again, creating a notion of what it could be like if your body could, actually, fly. This experience, which has been undertaken by more and more non-astronauts, including recently, artists, over the past 40 years (in fact before Gagarin's flight) is the ultimate intersection between hard scientific reality and humanity's age-old fantasy, the dream of flight. The out-of-body experience, the flying carpet, the flying broomstick, shamanic journey and yogic flying all collide with a horrible impact at the sheer brutal flesh and blood experience of the human body, organs and all being lifted out of the bonds of gravity.

To imagine leaving gravity behind it is necessary to do a little visualisation exercise. You are sitting in your chair reading this. You can not only feel the reassuring push of the chair against your bottom, your feet on the ground, but also in the way your arm rests on the table, your stomach positioned above the pelvis, the blood flowing in your veins and arteries gently weighing down on you, this book resting in your grasp. Now imagine all that departing in an instant. What a catastrophe it would be if gravity suddenly were to be cancelled out on Earth.

But it is possible to adapt? Long-staying cosmonauts and astronauts use little tricks to maintain their gravity-dependent selves, like strapping themselves into their sleeping bags so they can sleep with the sensation of the covers pressing down on them. They are constantly having to tie things down, using velcro and other products. They have ingenious uses for all three dimensions. They also learn that you can leave objects floating mid-air, but only for specific lengths of time. They swim around their space stations, MIR and now the ISS, but when they sit down for meals they all face each other the right way up to squirt food and liquids into their mouths. After only a week in microgravity the re-adaptation to Earth gravity becomes a major problem. They have to work out continuously. The trip to Mars may be a one-way ticket unless we take gravity with us. All this is known.

But there is a fundamental reality gap between the experiences of the community of 600 or so astronauts and cosmonauts, members of the exclusive club who have travelled into space, and the general public who live in normal gravity conditions. Some people even imagine that somewhere in NASA or a similar space training facility exists an anti-gravity room, where gravity can be switched off and people float around.. This doesn't exist, although in recent years, experiments in diamagnetism (aka 'the floating frog') now does allow organic matter, even animals, though not yet humans, to be floated using a combination of strong magnets and the weak magnetic force existing in everything. The Dutch Experiment Support Centre in Nimegen now offers this technique to scientists

wishing to investigate the effects of varying gravity on living materials, in some cases in combination with the parabolic flight facilities offered by ESA. This is as close to an anti-gravity chamber we have got, so, devoid of actual experience, the public only has mythology and literary metaphor to work with.

How different is the first zero gravity experience from a typical literary description? An evocative and intelligent recent example is to be found in Paul Auster's 'Mr Vertigo', where the young hero, Walter Rawley, is put through a number of depredations by the Hungarian showman Master Yehudi until 'There were no more tears to be gotten out of me - only a dry choked heaving, an aftermath of hiccups and scorched, airless breaths. Presently I grew still, almost tranquil, and bit by bit a sense of calm spread through me, radiating out among my muscles and oozing toward the tips of my fingers and toes. There were no more thoughts in my head, no more feelings in my heart. I was weightless inside my own body, floating on a placid wave of nothingness, utterly detached and indifferent to the world around me. And that's when I did it for the first time - without warning, without the least notion that it was about to happen. Very slowly I felt my body rise off the floor. The movement was so natural, so exquisite in its gentleness, it wasn't until I opened my eyes that I understood my limbs were touching only air. I was not far off the ground - no more than an inch or two - but I hung there without effort, suspended like the moon in the night sky, motionless and aloft, conscious only of the air fluttering in and out of my lungs'.

An earlier example, significantly from Russian culture, both geographically the homeland of nomadic tribes legendarily harbouring reindeer-powered trance-induced flying shamen, and the actual birthplace of human spaceflight, is this description of 'flying cream' from Mikhail Bulgakov's classic 'The Master and Margarita' : ...Margarita jumped out of her bathrobe with a single leap, dipped freely into the light, rich cream, and with vigorous strokes began rubbing it into the skin of her body. It at once turned pink and tingly. That instant, as if a needle had been snatched from her brain, the ache she had felt all evening in her temple subsided...her leg and arm muscles grew stronger and then Margarita's body became weightless. She sprang up and hung in the air just above the rug, then was slowly pulled down and descended. What a cream! What a cream! cried Margarita, throwing herself into an armchair.'

Interestingly there is little difference between these two descriptions, although the latter is written before many years before the first spaceflight and the former written after.

What are the other analogues to the zero gravity experience? Skydiving, circus acts, deep sea diving all produce experiences that modify gravity in different ways, and all these have been used by artists approaching reduced gravity at different times. It is significant, while perhaps obvious, that the first person to approach space agencies with a view to turning the flying dream into reality, was the determined and highly motivated choreographer and dancer, Kitsou Dubois. Herself influenced by Gaston Bachelard's statements in 'Air and Dreams' and influenced by a meeting with distinguished French astronaut Claudie Deshayes, Dubois set off on a one-woman mission to storm the defences of the carefully-guarded space establishment. Arriving at NASA's Goddard

Space Centre, armed with an introduction, Dubois was nevertheless given short shrift by NASA. 'I was French, I was a dancer, I was a woman'. Undaunted, Dubois managed to get a foot in the door with the the French Space agency, CNRS and in 1993 boarded the Caravelle Zero Gravity plane to become the first artist to intentionally experience zero gravity. (There are pilots and astronauts who have since turned artists, or who were amateur artists at the time. The keyword here is intentional.)

Watching those first video records of Dubois' first 'birth' into microgravity is both haunting and instructive, as you see her initial joy at flying for the first time being slowly replaced by her putting into action her dance training in this new environment. The first moments of the zero G experience in a parabolic flight can for some, be both traumatic and revelatory. Putting aside the well-known side-effect of nausea, usually experienced after four or five parabolic sequences of weightlessness, there is an aspect of disorientation, in which all the senses are discombobulated, the inner ear loses control and you are forced, as the Russian instructors in Star City put it, to 'test your emotional stability'.

My own first experience of flying in the Russia Ilyshin MDK 76 craft back in 1999, six years after Dubois' first flight was not helped by a complete state of unpreparedness and a mild problem of vertigo. I had been called to Star City, the former secret cosmonaut training base, near Moscow with three days notice (Get visa! Get medical!) by the explosive and charismatic Slovenian theatre director Dragan Zhivadinov who later was to mount the first full-scale theatre performance, complete with audience, on the Ilyushin. (Zhivadinov had made a solo flight as part of a cigarette company sponsored 'space training' competition the previous year in the new free-for all Russia.) My impromptu invitation had come through Marko Peljhan, a friend and long-time collaborator, who had also come in at the last minute to fire-fight the chaotic Zhivadinov's plans to mount a test flight for his actors. Peljhan had also had had contact with the Russian space agency through a live phone-in with the MIR station.

Arriving after a whirlwind of last-minute preparations we arrived at the gate of Star City in an aged 'cosmonaut bus'. We were clearly in unknown territory, waiting for over 3 hours to find someone in charge. A variety of officers in greatcoats and the characteristic Russian military big hats came back and forth with contradictory messages, but the Slovenian team, all Russian space buffs, kept spotting space legends entering and leaving. There's Leonov! And Krikalev! I remember feeling a mixture of anxiety and disbelief that we would ever be allowed to actually take off, but in what seemed no time at all we were lined up like squaddies with parachutes, after an apparently cursory medical exam and taking off in what seemed, in retrospect, a rather creaky but enormous jet plane, smelling of oil, jet fuel and feeling as if I hadn't missed the second world war and conscription in my lifetime after all. To my bemusement and even further disbelief my trainer for the flight was none other Yuri Gidzenko, another legendary long-duration MIR cosmonaut and later to command the mission to build the International Space Station.. Sergei Krikalev (the Last Soviet Citizen, stranded on MIR during the fall of communism) also joined us for the ride.

The first moment of zero gravity is one of those 'wake-up' moments where you feel like you have been dreaming for the rest of your life. Nothing quite computes, you feel as if you are somehow a character in a strange movie. I felt a sharp tingling of the blood around my extremities, followed by a massive panic attack. Time to test my emotional stability. In one direction to the left of my field of vision flew one of the Slovenian actors, stage-diving, hair flying, laughing. Gidzenko hovered solicitously upside down near me-'Are you OK' I nodded, stiff upper lip operational, as he flew off diagonally to play a game of 3 dimensional tag with Krikalev. 'It's the most expensive drug in the world' Zhivadinov said later, and seeing the cosmonauts get their fix, I could see why. Coming to terms with the effects of the drug myself, I could begin to see the disadvantages of my lack of preparedness. I could, for example have taken part in one of the training courses in movement in microgravity Kitsou Dubois now gives in warm swimming pools. Instead, I controlled myself with deep breathing and performed a vague yogic flying posture for two parabolas. Later I even tried to fly. Peljhan said afterwards it looked like the first attempt by anyone to crawl in zero gravity.

Coming to the ground, despite feeling as if I had either overdosed or escaped a fatal road accident, and having survived the traditional post-flight vodka toast, it became apparent however that this was a procedure that most healthy people could undertake. My colleague in the Arts Catalyst, Nicola Triscott, for example, took to zero gravity like a duck to water in the first flight we organised on realising it was possible to work in Star City. This marked the start of the first sustained zero gravity programme for artists in the world. Since then. in the last 5 years the Arts Catalyst has enabled over 50 people to experience microgravity, undertaken over 8 artists projects, 4 scientific projects, a radio broadcast, a short science-fiction film and flown a robot..

At the same time, there have been 2 flights, undertaken with some difficulty with NASA by artists from the San Francisco Art Institute, led by Frank Petronigro and Lorelei Lisowsky, although they were not allowed to describe their work as art projects. These artists now form the core of the Zero Gravity Arts Consortium, which aims to run affordable civilian flights for artists using a Boeing 737 owned by a new commercial body, the Zero Gravity Corporation. At the time of writing their first flight had yet to happen.

The reality gap between the public perception of flying the human body and the private world of the astronauts and cosmonauts has been closed a little. There are whole areas of spaceflight training that remain closed to artists, or any other civilians for that matter. The next area of interest could be Mars gravity, partial gravity, moon-walking, or to use a mythological metaphor, travelling with seven league boots. The use of the centrifuge as a spaceflight simulator has yet to be explored, although a non-human art project has taken place in Star City. Artists are also getting interested in diamagnetism. If you can float a frog, what else can you float?

We may not have 'flying cream' or antigravity chambers yet, but the chance of exploring different gravities is now a reality for artists who might be inclined to follow that path.