A Brief Guide

to

LIVING WITH DANGER

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About the Author

I'm one of those people who finds it difficult to settle down. Getting a degree in astrophysics didn't help. I worked for a while as a research astronomer then the bottom fell out of the jobs market for people with my qualifications. With a family to support, I searched around and found a job in Parliament House (Canberra). That was short-lived and I moved to North Queensland where I worked in public relations and journalism. The Great Barrier Reef was just offshore and it wasn't long before I got involved in the diving industry. That led to other tourist operations. My final venture was to set up a backbacker hostel. I'm now retired and have lots of time for travel and writing. *Mike Dixon, January 2016*

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1.1 Speed Skydiving

Imagine falling off a cliff. You might get the nasty feeling that your speed will go on increasing and you will break through the sound barrier before being dashed to pieces on the rocks below. Be assured you are wrong. As your speed increases, wind resistance increases and a happy state is reached when it matches your weight. When that happens, you will have attained terminal velocity … if the cliff is high enough.

The terminal velocity of a skydiver, lying face down, is about 320 km/h (200 mph). About 50% of this is attained in the first 3 seconds. It takes a further 5 seconds to reach 90%.

Peregrine falcons (photo) streamline their bodies when swooping on prey and get close to terminal velocity much faster.

Competition speed skydivers adopt the same technique and have achieved speeds of over 500 km/h when jumping from aircraft. Far higher speeds have been reached in jumps from balloons.

The current speed record is held by Felix Baumgartner who gained the distinction of being the first person to break the sound barrier in freefall. Baumgartner jumped from a height of 39km in a specially designed suit and reached a speed of 1342 km/h (834 mph).

1.2 Wingsuit Flying

This sport is the exact opposite of the one described in the last chapter. The aim of speed skydivers is to descend as fast as possible. Wingsuit divers aim to descend as slowly as possible.

Wingsuits transform wearers into something that looks a bit like a flying possum. Maybe that's how the early pioneers of the sport got the idea. At any rate, wingsuit diving has been around for a long time.

An early attempt was made, in 1912, by Franz Reichelt who jumped from the Eiffel Tower. Franz tricked the security guards into thinking he was going to test a model flying machine then climbed into it when they weren't looking. His parachute failed to operate when he reached the end of his glide and he made a sizeable hole in the frozen ground. This first recorded wingsuit fatality was captured on film.

Franz's failure did not deter others. Attempts were made to increase horizontal glide but with mixed success. Early wingsuits were constructed from materials such as canvas, silk, wood and whalebone. They were not as effective as those available today. Nevertheless, some early "birdmen" claimed to have glided for miles.

The modern wingsuit was developed in the 1990s. Prototypes were tested in "vertical wind tunnels" and big improvements were made. Descent speeds as low as 30km/h were achieved while gliding horizontally at speeds of over 300km/h.

More recently, jet-powered wingsuits have appeared. One of the earlier models was pioneered by Visa Parviainen who jumped from a hot air balloon in Lahti, Finland, in October 2005. Visa had two small turbojet engines strapped to his feet and achieved horizontal flight with no loss of altitude. Big advances have been made since then including powered flights over the English Channel and Swiss Alps.

1.3 Formation Skydiving

My favorite sport is scuba diving. When I worked in the scuba industry I found myself instructing people whose passion was for other things. One guy was hooked on formation skydiving. He was a comparative novice at scuba when I introduced him to the wonders of the deep.

He was thoughtful when we returned to the surface, comparing the preparations for a scuba dive with those for a parachute jump.

“It’s the same but different,” he said.

“In what way?” I asked.

“You go through the same safety checks. In scuba everything proceeds slowly after that. In skydiving everything speeds up.”

He went on to tell me that, in formation skydiving, you have to lie flat and spread yourself out to increase wind resistance and keep your vertical descent as slow as possible. Then he said something unexpected.

“After that it is a lot like scuba.”

“What do you mean?”

“The air feels like water.”

I took his meaning. Put your hand out of a car window and feel the air as it rushes past. The sensation is like swimming.

We discussed our two sports and I developed an immense respect for his. He told me how his skydiving club had put on spectacular performances. He came from Chicago and his club used planes that flew to 90,000ft. That means they went almost 3 kilometres up into the sky before discharging their skydivers.

The logistics of the operation were impressive.

More than a hundred skydivers were frequently involved and a fleet of planes was needed to take them up. No more than two minutes could elapse before the divers came together, in an awe-inspiring embrace, then scattered to make a safe parachute descent to earth.

I had previously thought of this sort of operation as inherently dangerous. When I studied the records, I discovered that is was far safer than I had thought.

1.4 Storm Riding

One of the dangers of paragliding is storm riding. Experts are always on the lookout for spots where air is rising. In competitions, those who are adept at finding them win. They detect an area of uplift and make for it. Sometimes they are too clever for their own good.

The rising body of air might develop into a formidable convective cell. That's what happens when ferocious thunder storms get underway. The air rises to immense heights and the paraglider is carried up with it.

Eva Wisnierska suffered that fate when she was taking part in a training flight for a World Championship Meeting in Manila, NSW, Australia.

The German paraglider survived lightning, pounding hail, minus 40-degree temperatures and oxygen deprivation after she was carried to an altitude higher than Mount Everest.

She passed out from lack of oxygen and flew unconscious for about an hour, covered in ice, at an altitude of 10,000 metres … the cruising height of an airliner.

Eva says she thought she had no chance of survival. A doctor later told her that blacking out had saved her life. Her heart and other bodily functions slowed down and she went into a state of suspended animation.

Eva's top speed of ascent was 20 metre/sec and top speed of descent was 33 metre/sec, as recorded by her personal monitoring computer.

Her injuries were severe. Eva suffered frostbite and bruising from huge hailstones. She landed 60 kilometres away from the launch site and was rushed to hospital.

A fellow paraglider was not so lucky. The body of He Zhongpin was found 75 kilometres away from the launch site. Investigators say he most likely suffocated and froze to death after being sucked into the storm.

1.5 Extreme Surfing

If you want to surf the really big ones then you'll need a buddy with a jet ski or a friendly helicopter pilot. They'll put you down before the approaching monster. After that it's up to you to surf the wave and emerge safely. It's guaranteed to be an adrenaline pumping ride … whatever happens.

Waves can get very big when a deep ocean swell reaches land. They are particularly big when the transition from deep to shallow is abrupt. Many Pacific islands meet this condition and are home to monster waves.

The Hawaiian Islands are famous for theirs. Waves higher that 50ft have been surfed on Oahu during competitions. If that doesn't impress you, take a look at a six-story building and imagine riding a wave as big as that.

It's a risky business. The big danger is "wipe out". That happens when the breaking waves push surfers down under the water. Once they stop spinning around, they must regain equilibrium and decide which way is up.

There's no time to waste. Less than 20 seconds may elapse before the next wave arrives. Surfers have been taken down to such great depths that their eardrums have ruptured. Others have received severe injuries when smashed against the sea floor.

The list of fatalities grows.

1.6 Scuba Diving

I once worked in the scuba industry. That was when I lived in North Queensland and was involved in tourism. The wonders of the Great Barrier Reef were offshore and I was keen to show them to our visitors.

That wasn't easy.

Diving is hazardous. People die when mistakes are made. Here, I shall confine my remarks to the hazards of sports diving. Commercial diving is different and best left to the professionals**.**

The main hazard of scuba is breathing compressed air. That's a basic fact that we, as beginners, must get firmly into our heads, right from the start.

The air comes from a tank strapped to our backs. It is compressed to about 200 atmospheres and delivered to our mouthpiece by a device known as a regulator. It ensures that the air we breathe is at the same pressure as the surrounding water.

As we go deeper the pressure increases. At 10 metres (33ft) it has gone up by 1 atmosphere. At 20 metres it has risen by 2 atmospheres.

Wow! That's what we put in our car tires.

Our body can withstand the harsh treatment because the air pressure in our lungs is balanced by the water pressure on our rib case. Now imagine what would happen if we held our breath and shot up. You don't need a physics degree to realise that our lungs would explode before we reached the surface.

Rule One: Never hold your breath.

Rule Two: Don't stay down too long.

The second rule is important because nitrogen gets dissolved in our blood when we breath compressed air. If we aren't careful we will be like that bottle of fizzy drink that bubbles when the top is unscrewed.

Bubbles form in our blood stream. The condition is known as *"The Bends"* and is particularly dangerous when the bubbles become trapped in the brain or spinal cord.

The rate at which nitrogen dissolves in blood increases with pressure and therefore depth. I advised divers to stay above 10 metres. The best corals can be seen there.

Not everyone took my advice. Some of my divers got the bends and I had to do my bit as an assistant in the recompression chamber. I stripped off and dressed in the regulation clinical smock. The bends victim joined me and the pressure in the chamber was pumped up to a level where bubbles in blood would dissolve. Then the pressure was slowly returned to normal.

Recompression usually returns bends victims to normal health but not always. Some live with the consequences for the rest of their lives … some die!

Okay. Enough of the scary stuff. I've warned you about burst lungs and the bends. They sound frightening but they are not the main killers.

Most scuba victims drown.

A common cause is fatigue. Divers get up early, drive long distances to their chosen dive site and enter the water from a beach or even over rocks. They are not in top condition when they begin the dive and are near exhaustion when they struggle through waves to get back on land. It's a prescription for disaster.

Another killer is current. Divers are swept away. This is a problem in daylight. On night dives it's far worse. Lost divers are very difficult to find in the dark once their lights have gone out. If you are a beginner avoid strong currents,

Finally, a few words about sharks.

Divemasters tell their charges that sharks eat fish and have not developed a taste for people. That is largely true. Very few scuba divers are attacked by sharks under water. Attacks are more likely when the diver has returned to the surface … but they are rare.

There is, however, one shark that takes divers and that is the famous White Pointer. I have vivid memories of a dive near a seal colony in the cold waters of southern Australia. The playful animals jumped down to join us in the water. It was a great experience. Humans and seals having a great time together. Then the seals made a dash for the rocks.

For a brief moment we were alone. Then a gigantic shark hurtled past. Its white markings are still engraved on my mind. We surfaced and clambered into our rubber boat, aware that the Big White could rip it to pieces in seconds.

Stay out of the creature's territory.

1.7 Breathhold Diving

My photograph is of Herbert Nitsch who has the distinction of diving to a depth of 253 metres (831ft) on a single breath of air. I'll return to him later. First, I'll talk about the sort of things an average person might attempt if they decided to take up breathhold diving as a sport.

Imagine yourself buying a mask, snorkel and flippers. You have an underwater camera and you are keen to get some great underwater shots.

At first, you have difficulty holding your breath for more than half-a-minute. Then you get better. Soon you can manage a minute or more. That means you can go deeper. You reach twenty metres then thirty metres and feel very pleased with yourself. You think you are safe. When your chest starts to heave from lack of air, all you have to do is rocket back to the surface for a quick gasp.

You tell yourself that breathhold divers can do that. They are not like scuba divers who have compressed air in their lungs. If scuba divers rocket up their lungs will suffer terrible injuries when the air expands. You think you can go up as fast as you like whenever you like.

Then you learn about shallow-water blackout.

It can happen when you surface before you are desperate for a breath. Your lungs are taking in enough oxygen from the air for you to feel comfortable. But the air in your lungs is compressed and your lungs are having no difficulty extracting oxygen from it.

At 10 metres the air pressure has almost doubled. That's because the water pressure on your rib case has doubled. At 20 metres it's about three times as great.

That helps you hold your breath. As the pressure increases your lungs are increasingly able to absorb the small amount of oxygen that remains.

The reverse happens when you rocket up for that vital gasp. Your lungs are no longer able to absorb sufficient oxygen as the pressure goes down. Oxygen levels in your blood collapse …and you blackout!

Even if you are still conscious when you reach the surface you are still not safe. You take a big gasp but the oxygen takes time to enter your blood stream … and you blackout!

Founder of the freediving organisation, Apnea International, Erez Beatus, advises freedivers to dive with a safety buddy.

"If something goes wrong, your buddy can be watching you … If you go deeper than 10 metres then the sole responsibility of your buddy is to take care of you all the time."

Note of Caution: Safety buddies should use scuba gear for deep dives. However, they must be aware of the dangers of sharing their scuba mouthpiece with a breathhold diver. When the breathholder takes in the compressed air from the scuba supply, his lungs will expand. Fatalities have occurred when breathholders have returned to the surface not realising that they must breath out. Whenever air is shared the usual scuba safety procedures must be followed.

Finally, A few words about Herbert Nitsch: He is one of a small group of people who have seemingly defied the laws of nature by diving to immense depths on a single breath of air. Their amazing feats have given rise to an immense body of clinical research. I'll not go into it here. If you are interested, search the internet using tags: *freediving, record, Herbert Nitsch.*

1.8 Shark Feeding

People say that something is dangerous and you don't take them seriously. You've done it so often you're blind to the dangers.

When I was in the diving industry we used to feed sharks. It was part of our service and very popular with customers who craved an adrenalin high and wanted some stunning photographs to show the folks back home.

The sharks liked it too. They enjoyed a free meal and soon caught on. When they heard the sound of our engines they would congregate around the feeding stations.

We'd arrive and find them waiting for us. It was all very convenient and predictable ... or so it seemed.

The regular diners were reef sharks, of the white-tipped variety, with fine physiques and good table manners. They didn't crash in for a quick bite. The white tips took time to assess the situation and decide when it was safe to take the tempting morsels that we were handing to them. It wasn't difficult to see why they had survived the Permian Extinction and gone on to see the demise of the dinosaurs.

Admittedly, they got a bit agitated on occasions. That was when bronze whalers and tiger sharks appeared. We got used to the whalers but the tigers continued to spook us.

In a sense, we got it half-right.

Reef sharks are safe but whalers and tigers should be treated with caution. We worried about the whalers and tigers. If we had thought more carefully, we would have worried about hammerheads. One day a mob of the weird-looking sharks appeared and went on the rampage.

Bags of fish were snatched from our hands and a leisurely dinner party degenerated into a feeding frenzy. Divers panicked and fled for the surface (dangerous). Others froze (wise). One guy received cuts to his hand. Blood streamed from the wound and that was scary.

We left the scene and got back to our boat, relieved that no one was seriously hurt. After that, shark feeding was dropped from our list of activities. Other operators continued to offer the service and it still goes on despite the occasional mishap.

My advice is to avoid shark feeding unless you are in an iron cage and well out of reach of the sharks. Shark viewing is quite different. Sharks are often around when you go for a dive. There's no need to ignore them.

1.9 Extreme Rock Climbing

I was once a member of a mountain rescue team. We went to the aid of climbers who had run into difficulties. On two occasions we were asked to retrieve dead bodies. In both cases the climbers were unroped and climbing solo. They were not a pleasant sight.

I developed a considerable distaste for climbers who take extreme risks. But, I have great admiration for climbers who undertake extremely difficult climbs and do so safely.

Kevin Jorgeson and Tommy Caldwell are two of my climbing heroes. They recently scaled the 3000ft Dawn Wall of the El Capitan rock formation in the Yosemite National Park, California (photo, above).

The pair did so as free climbers. That is to say, they didn't use any aids to climbing. In particular, they didn't support their weight on ropes when climbing.

But, they did use ropes for safety. The photograph shows what I mean. A rope is trailing behind the climber. Its sole purpose is to protect him should he lose his grip and fall.

The two men worked their way up the sheer rock face by jamming their hands in cracks and clasping onto minute holds with their fingertips.

The climb extended over 32 pitches — 32 climbing rope lengths. The pair followed a strict rule: If one of them fell then they must return to the start of the pitch and start all over again.

The climb took two-and-a-half weeks. At night they retreated to their tent and rested, ready to start climbing again the next day.

1.10 Extreme Skiing

There was a time when a 60-degree slope was regarded as the ultimate in skiing. Then, during the 1980s, those dull days passed. A new breed of skier came on the scene and realised that the sky was, quite literally, the limit.

The ultimate dream is to be taken to a remote spot by helicopter and lowered onto a high peak. Skiing on fresh powder snow, on a slope of 70-degrees or more, is full of new and exhilarating surprises.

Your presence can trigger avalanches. You must outrun them and avoid any crevasses that might appear. Hidden rocks are a menace. They are all part of the adrenaline-pumping fun that makes your downhill rush so unforgettable and rewarding.

The final triumph comes when you reach the cliff at the end of the slope. It provides a perfect platform for a base jump. You launch yourself and your parachute opens.

If all goes well, your buddies in the helicopter will have filmed your escapade and you will soon be watching it on U-tube.

If it doesn't …

2.1 Mass Extinctions

The last mass extinction was bad news for the dinosaurs and good news for the mammals. It happened, about 65 million years ago, when a comet arrived from outer space and blasted a big hole beside what is now the Yucatan Peninsula in Mexico. We can be fairly certain of that because the hole is still there and distinctive debris, from the impact, accumulated as a thin layer in geological deposits.

The debris spread all around the world and can be seen almost everywhere. Below it, there are bones of dinosaurs. Above, the dinosaurs have gone. All that remains of their lineage are their distant cousins … the birds.

Mammals were around before the comet arrived and survived the deadly impact. Living with dinosaurs had been difficult. The big beasts could tear you apart with their fearsome teeth or knock you flat with a swish of their mighty tails. The best tactic was to remain small and insignificant.

All that changed with the coming of the comet. The dinosaurs vanished. The mammals could now grow as big as they liked, subject only to the laws of nature and an adequate food supply.

Sabre-toothed tigers evolved from tiny cats when conditions were favourable and shrank back down when conditions changed. That has happened many times during the 65 million years since the arrival of the comet.

The tiger was a danger to other creatures but not nearly as dangerous as the creature that emerged from the African jungle three million or so years ago. It left the rainforest and roamed the grasslands that were encroaching on its ancestral home.

An ape came down from the trees and began to walk on its hind legs. As one generation gave way to another it became more upright and, by about a million years ago, it looked very much like us.

In time, it became proficient in the use of fire and began to fashion tools. Cousins formed groups and went their separate ways. Some left Africa. The Neanderthals were one and their remains are found in Europe and the Middle East. The Denisovans are another. They lived further to the east.

We (Homo sapiens) came on the scene relatively recently and our arrival was bad news for the cousins. There was something about us that made us very difficult neighbours. We entered their territory and replaced them everywhere on planet Earth.

Forensic experts have construct detailed models of the Neanderthals. Enough skeletal remains survive for us to be confident that they provide a good likeness, right down to hair and skin colour.

The models show that our Neanderthal cousins were strongly built, with light skins, fair hair and prominent brow ridges. Their brains compared favourably in size with our own.

Dress one up in modern clothes and send him off down the street. Few would stop to take a second look. The Neanderthal would blend in. Enough of us have similar features.

Yet, we replaced (or almost replaced) the Neanderthals and the other cousins. There was something dangerous about us and it has not gone away. Our presence on this planet has been bad news for other creatures, great and small.

There are those who believe that the Earth is facing another mass extinction and we (Homo sapiens) are the cause. Each year, the list of species facing extinction grows bigger. Our exploitation of the Earth's resources is taking a terrible toll and not just on cuddly animals.

The extinction of pandas would be tragic. Let's not forget the things we cannot see. Tiny microbes, vital to basic life processes, are being poisoned by the ever expanding cocktail of toxic substances produced by our chemical and pharmaceutical industries.

I mentioned that we did not entirely replace the Neanderthals and Denisovans. They live on as part of us. Our ancestors interbred with the cousins.

If are of European ancestry, there is a chance that as much as six percent of the DNA, that makes you human, comes from Neanderthal forebears. If your ancestors lived in South-East-Asia, then there is a similar chance that you are related to the Denisovans. If you are of entirely African ancestry, then the chances are far less.

If you want to know more about your remote ancestry then you can join the half-million people who have participated in National Geographic's ground-breaking Genographic Project.

They will supply a DNA Ancestry Kit. Amongst other things, you will discover if you have any Neanderthal or Denisovan ancestry. Go to:

https://genographic.nationalgeographic.com

2.2 Earthquakes