



# TransformationalSafety.Com

“We Exist to Assist”



## A Second on Safety

July 2016



THE  
BLACK SWAN



The Impact of the  
HIGHLY IMPROBABLE



**Have you seen a Black Swan flying around your place – or was it just a Grey Goose?**

Well you could be forgiven for thinking "what's this all about". What do swans, particularly black ones, have to do with Safety? I am hoping that very soon you will be considering the black swan one of the most important birds on the planet.

Had you been wandering around any time prior to 1700 you would not have even thought there was any such thing as a black swan. All the swans in the world were white. It was only after a Dutch explorer (Willem de Vlamingh) turned up off the coast of Terra Australia in 1697 that there is any record of a black swan – or so it was thought.

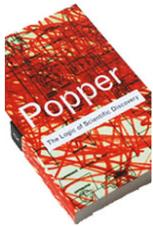


It was then that Willem de Vlamingh took a wrong turn and turned up on the western coast of Australia. In that one moment thousands of years of “thinking” and “belief” were literally destroyed. What confronted Captain Willem was not a black swan, but many hundreds of them. Indeed in his writings he noted he could not find a white one. For the Australian aborigines, who had lived in that part of the country for tens of thousands of years, they would be well suited to saying “as rare as a white swan” – because they had never seen one – all theirs were black.

The main river in Perth (the capital of Western Australia) is actually called the Swan River. You can guess what swan the river was named after. They were more common than grains of sand. Not only that, the premium beer in this part of the world is also named after a swan. Guess which one? Hint – it wasn't white.



So why is this talk of black swans (and white ones) at all important? It goes directly to our understandings around our environment, our method of thinking (inductive reasoning), our understanding of risk (or lack of it) and so many other parts of our experience – and how that directly applies to the safety equation. Whilst I would like to spend some time waxing lyrical about the philosophy of science, and how that feeds directly into our inductive



thought processes regarding statistics, safety, and risk; that is a conversation for another day. Insofar as I can't help myself, and if you are at all interested in exploring this leading edge stuff, take a look at some of the work of [Karl Popper](#) and [Paul Feyerabend](#). Both these guys wrote about scientific thinking decades ago, yet they are as relevant today as the day they published.

So what is a Black Swan Event (BSE)? It is an event that is largely unprecedented, and unexpected, at the point in time that it occurs. Much like when de Vlamingh sailed into flocks and flocks of black swans. What is also often observed is that after considering the surrounding context, subject matter experts, and in many cases just the "ordinary Joe", many will say: "it was bound to happen", or "I knew something like that was going to happen, just not sure when". Even though some factors are likely to differ (such as the event's time, location, or specific type), it is quite common that similar events have happened previously. We just haven't noticed, or filed them in the "never happen again", or "won't happen to me" files.



Hopefully you can now see where the term Black Swan originates from. The long held belief throughout the western world (as it was at the time) that all swans are white. Back then to say that there might be a black swan would be about as likely as when Copernicus suggested that the earth was not the centre of the universe. Utterly preposterous. Let's not forget Galileo and how the "system" treated when he offered up some Black Swan thinking that threatened the status-quo thinking of the day.

Willem de Vlamingh's detour was an unexpected event in (scientific) history, and profoundly changed zoology. After the black swan was discovered, it seemed pretty obvious that black swans had existed all the time, just as other animals with varying colours were known to exist as well. In retrospect, the surrounding context (i.e., the observations about other animals) seemed to imply the black swan assumption (no-one put the numbers together) – empirical evidence just validated it. In other words there were just so many white ones, one could not imagine a black.



The theory around Black Swan Events was introduced by Nassim Taleb in his book "The Black Swan – The impact of the highly improbable<sup>1</sup>". This is arguably one of the most important books to have been published in the last fifty (50) years.

Taleb said a Black Swan Event has three properties that make it so.

*Rarity:* The black swan is a rare event. It lies outside the realm of common experience. A black swan is that million-to-one chance that statisticians said would never happen because it was a million-to-one chance. Yet, million-to-one chances happen 9 times out of 10. That's worth a serious thought or two.

*Extreme impact:* When the black swan strikes, it has a massive impact. It is an explosion at a coal mine killing over three hundred (300+) people. It is the hijacking of a couple of aircraft and flying them into buildings. It is the example of a somewhat middle aged Australian cyclist being struck by a motor vehicle travelling at over 80 km/hr. Not only is the qualitative nature of the black swan outside our "experience" – a single event can dominate over all other factors.

*Retrospective predictability:* This property explains the concept of "black swan blindness" or "black swan denial". It is the illusion that we can actually see things coming. This is because of the narrative fallacy; our ability to construct a sensible story using only the pertinent information, happily discarding the information that wasn't actually useful in the end. This can only be done with the benefit of hindsight — failing to understand this makes you more vulnerable to their effects.

<sup>1</sup> Taleb, N.N. (2007), "The Black Swan – The impact of the highly improbable", Random House, NEW YORK, UNITED STATES

## The Christmas Turkey



One of Taleb's best stories about Black Swan Events is that of the turkeys that are lovingly raised for Christmas dinner<sup>2</sup>. If a turkey considers its own history, it can consider itself pretty lucky. Seems to have the best of everything. Certainly a better life than those chickens across the aisle that just laid a few eggs. The turkey is fed on only the best natural grains, and provided with fresh water every day. It seems that the owners are doing all that they can to provide a salubrious stress free existence. No indication from these past events suggests that it shall ever be any different. One day is as good as the other – certainly no improbable events here. The turkey never seems to notice that mom and dad, plus a whole generation of aunts and uncles are nowhere to be seen. There are a few warning signs, but nothing bad seems to be happening, so the turkey just keeps on “gobbling” and all is sweet. The turkey notices nothing.

One day though everything changes. The owner arrives wearing an apron and gloves, wielding some sort of silvery edged implement. The turkey has no idea it is about to be the centrepiece on the family Christmas table. However, after the event (assuming the turkey lives at least to the point where it finally figures it out – if they ever do?) it becomes “obvious” that it was being raised for “the chop”; all that protection and the vaccinations were to keep it healthy, the excess food was to fatten it up. In short, after the event, the “experience” becomes clear.

Until the head left the shoulders, the turkey would have no idea. Our natural psychological state (not much different from a turkey) prevents us from recognising “the “black swan”. The turkey's belief that every day would be fantastic is being reinforced by the fact that every day has been fantastic. The accumulation of supporting information (because that is all the turkey is looking for) doesn't just reassure the turkey, but also actively destroys its ability to think about what it doesn't know. As a result the turkey undergoes a terminal revision of belief – It's a bit late then.

The moral of the story; do not be a turkey.



## Good and Bad Swans

Taleb also speaks to what he calls “good” and “bad” black swans. Yes, the swan has a “conscience” of sorts. Examples of good Black Swan Events might be the personal computer (even though we know IBM had no idea about that one). Another might be considered the Internet – subject matter experts were still saying it would amount to nothing as recently as the 1980's. There are, of course, many others. Of course, good and bad Black Swans can also be a matter of personal and cultural perception.

Sadly, we often don't find it difficult at all to identify bad Black Swan Events. The First World War would have to be considered a Black Swan Event. The two key personal protagonists were first cousins. Then we have its sequel, The Second World War. Even with all the “preparations”, we still saw Neville Chamberlain alight from an aircraft espousing “peace in our time”. Less than a year later the world was embroiled in a conflict that resulted in countless losses, both on the battlefield, in the “death camps”, and under the bombs, culminating in the absolute horrors of Hiroshima and Nagasaki in Japan.

Good and bad swans don't have to be on that almost limitless scale. We do seem to have a tendency to think “big”.

Consider for a moment the story of Owen Scholes. At 08:36am I received a telephone call from the safety officer for Maitland<sup>3</sup> City Council (Australia). He was in tears and I shall never forget his words “Dave we need you, we've just killed someone”. As a trauma psychologist I immediately travelled to the scene, and later at the depot was involved in psychologically triaging his workmates. This was a disaster that involved one (1) fatality. The impact on the organisation was significant. The impact on Mrs Scholes was beyond horrific. BTW



<sup>2</sup> Does not have to be a turkey though. Consider any other animal we might raise for the table. I know some lambs that have it pretty good – at least for a while?

<sup>3</sup> Just happens to be the city in Australia that I live in.

she was eight (8) months pregnant the day her husband died. The Transformational Safety.Com approach to what constitutes a disaster is a little different to that originally proposed by Taleb. We believe that a “disaster” is also measured by its qualitative impact on an “individual”, as much as it might be measured against a “collective”.

So one of the key questions about Black Swan thinking is whether or not the traditional understandings about risk have any role to play.

My own view is that “risk” is an over-rated term that is actually very poorly understood.

How many major accidents (quantitative or qualitative) have occurred as a consequence of there not having been a risk assessment completed?

The answer is very, very few.

What some people will say, and I get sick of hearing it, is that the risk assessment was obviously flawed.

Why is that?

Because there was an accident.

I am hoping that is sounding maybe a tad familiar? For goodness sake, that’s about as valid as the Turkey.

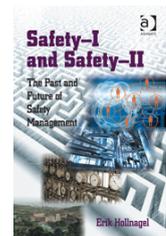
There is one aspect of Black Swan thinking that we should spend some real time considering:-

- What you “don’t know” is way more relevant than what you do.

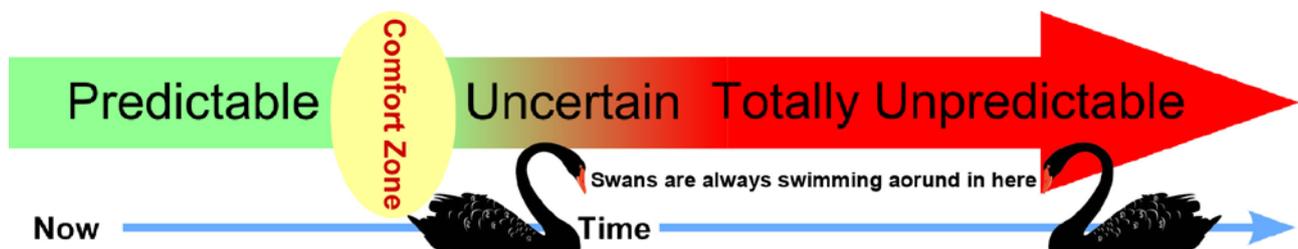
What this all means is that the BSE is the culmination of limitations in our understandings about likelihoods, probabilities and risk.

It can also be a consequence of our unwillingness to consider options that might come from other sources. It is not only limitations, but also can be a product of distortions with regard to “knowledge”. Many of us would be surprised at how easily we can have our “knowledge” distorted – both deliberately and otherwise.

The biggest mistake we make in safety (in fact there are many “big” ones) is around this whole world of prediction based upon what we “think” we “know”. We get this wrong way more than we get it right. When something “bad” does not happen we accept that as validation that our “prediction” had been correct<sup>4</sup>. Anyway this misplaced “validation” just further reinforces the fallacy of prediction that has become part of what we think we “know”.



We seem to have been hard wired to be predictive – or so it appears.



Black Swan Events swim/fly amongst us just often enough to show that we should not be “comfortable” in our personal predictive fogs (comfort zones). Guess what happens though? In no time at all we place ourselves back in that fog. It is way more comfortable to fumble about thinking that we “know”, rather than acknowledging overtly that just maybe we don’t?

<sup>4</sup> This is when you should be reading Erich Hollnagel's very recent work on Safety II.

Now we do need to have a sense of predictability to our lives and organizations. Surviving too long in a soup of randomness would be almost impossible. We get this sense of predictability from what is called “inductive reasoning” – now you wished you read those references to Karl Popper? The problem here is that whilst we can’t live without inductive reasoning, we can’t live perfectly with it either.

There are a number of “traps” that just come along with “induction” – most of us have no idea. Well, in actual fact we do, we just don’t realize, or are unwilling to listen to that nagging little voice that provided the warning. We see that Black Swan in the corner of our eye and pay scant attention. We probably just thought it was a grey goose?



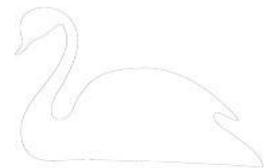
The very nature of the Black Swan Event (BSE) says that there is little value in just investing more and more and more time on trying to improve our ability to predict. By definition no matter how good we are at predicting (or think we are) BSE’s are still going to happen. Remember they don’t have to happen often, but when they do they have these massive consequences. Now please remember “massive consequences” does not necessarily mean number of dead people. Consequences are entirely relative. One injured person may well be a “massive consequence” if it is your relative etc. Remember Mark Scholes?

What we have to do is actually be willing to spend way more time seeking out (hunting) the Black Swan. So how do we do this?

- We discard the obsession with risk assessment and prediction.
- We replace it with a willingness to instead look closely at the robustness of the “knowledge” we think we have.
  - That means we have to be willing to understand error and our proneness toward making them.
  - There are certain environments where errors are more likely to be made.

In the August edition of A Second on Safety I shall spend some time exploring the simplicities of error and how they may collectively contribute to a culture that may become blind to the Black Swan.

Have you ever heard the statement “if all you have is a hammer everything looks like a nail”. Oh how so very true. If you remain constrained by the limitations of your risk based predictive mind-set the only swans you shall ever see shall be white.



What a tragic circumstance for us all

With my kindest regards

*David G Broadbent*

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