

# What Lessons Can Disasters Teach?

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At a conference I attended last year, a Tokyo University philosopher revealed that he had considered suicide following the Fukushima Disaster



Rene Descartes

Because his beliefs (or certainties) about were so badly shaken by the tsunami and its aftermath

He also criticized the STS community for not using its expertise to make better sense of the disaster

I was (and remain) surprised and disturbed by the philosopher's comment.

So I've asked myself:

What is my 'expertise'? And how can I use it make sense of the disaster?

I'm an historian

Historians learn to have few certainties or beliefs about the possible directions of human events

*Historians of science & technology* learn to have few certainties about natural events or our attempt to understand them (science) and control them (engineering and medicine)

*Historians of Japan* have many, many examples of unpredictable events to draw on



History is grounded in *skepticism* (questioning everything; believing little)

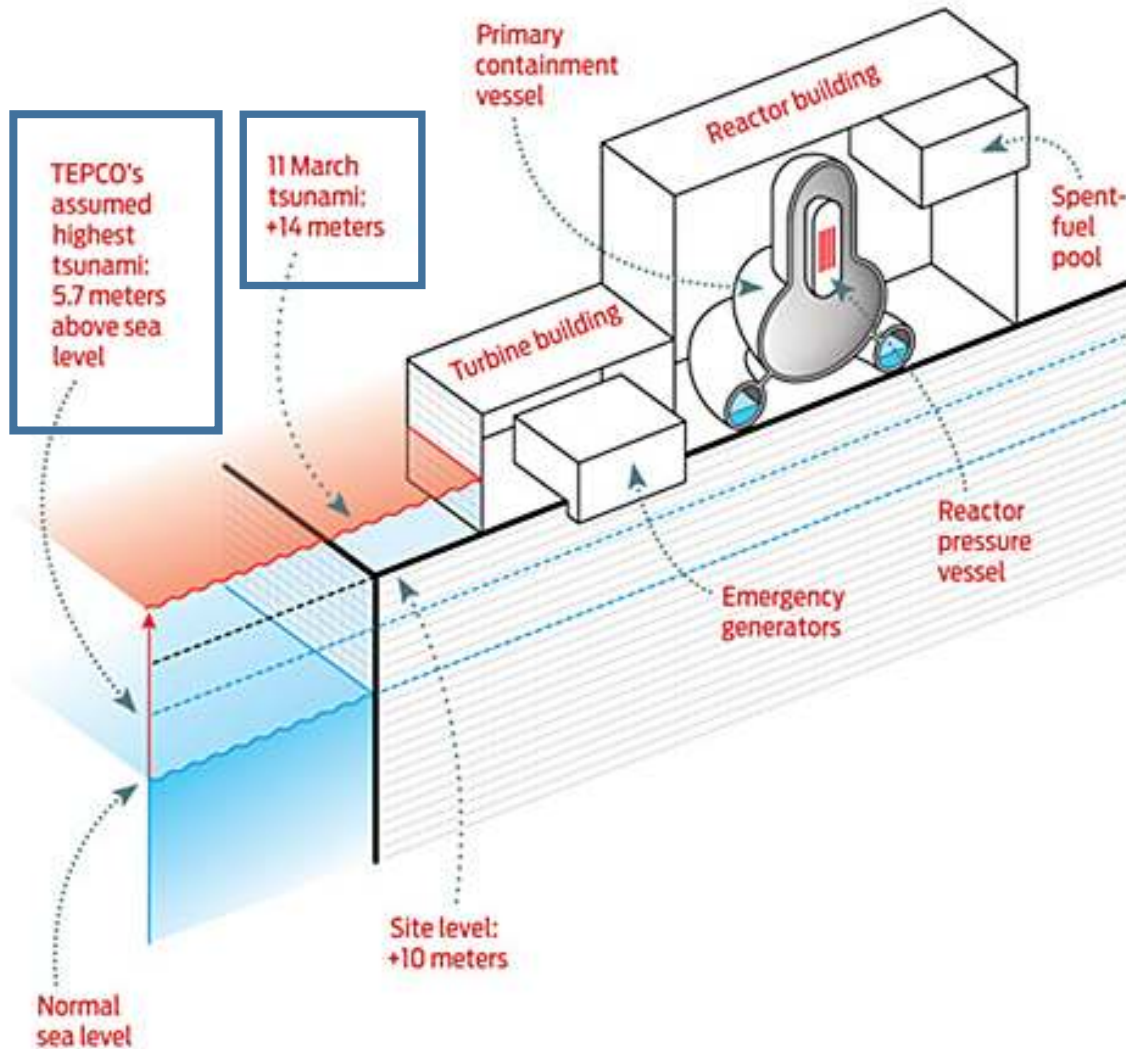
Philosophy is also grounded in skepticism, but without historical examples to draw on, philosophers (and scientists, and social scientists) can fool themselves into seeing the world as a series of *models*

The Tokyo philosopher was despondent because his *model* of the world (what it is and how it works) had collapsed

He had not considered that a gap exists between our *models of the world*, and *the world as it actually is*

Disasters/Accidents teach us precisely this lesson  
*They reveal the existence of this gap, which is usually invisible to us*

# The 8.3 Meter Gap





After a disaster, most people prefer to perfect existing models, or create new ones, rather than question model-making itself



Mr. Goh Chok Tong,  
former Prime  
Minister of  
Singapore  
Speaking in 2011



“I am not saying we shouldn’t do anything about the flood. But the amount of noise you made with just sporadic flood compared to the Japanese. I saw them on TV. Very stoic looking . . . this has happened, just get on - that’s the kind of spirit you want to have”



(Mr. Goh is an engineer)

“This has happened, just get on” pre-supposes that disasters and accidents are fixable technical matters, and should not shake a citizen’s faith in expert knowledge. Things should return to normal.

Two mirror-image “lessons” after a disaster:

The Tokyo philosopher: “Everything I knew and believed about the world has collapsed; we cannot carry on (unless we build a better model)”

The Singaporean engineer: “Everything I knew and believed about the world was (almost) right; let’s carry on by improving the current model)”

A Third View or Lesson:

A disaster invites us to stop thinking we know more (or can know more) than we do, and particularly to see the limits of model-making

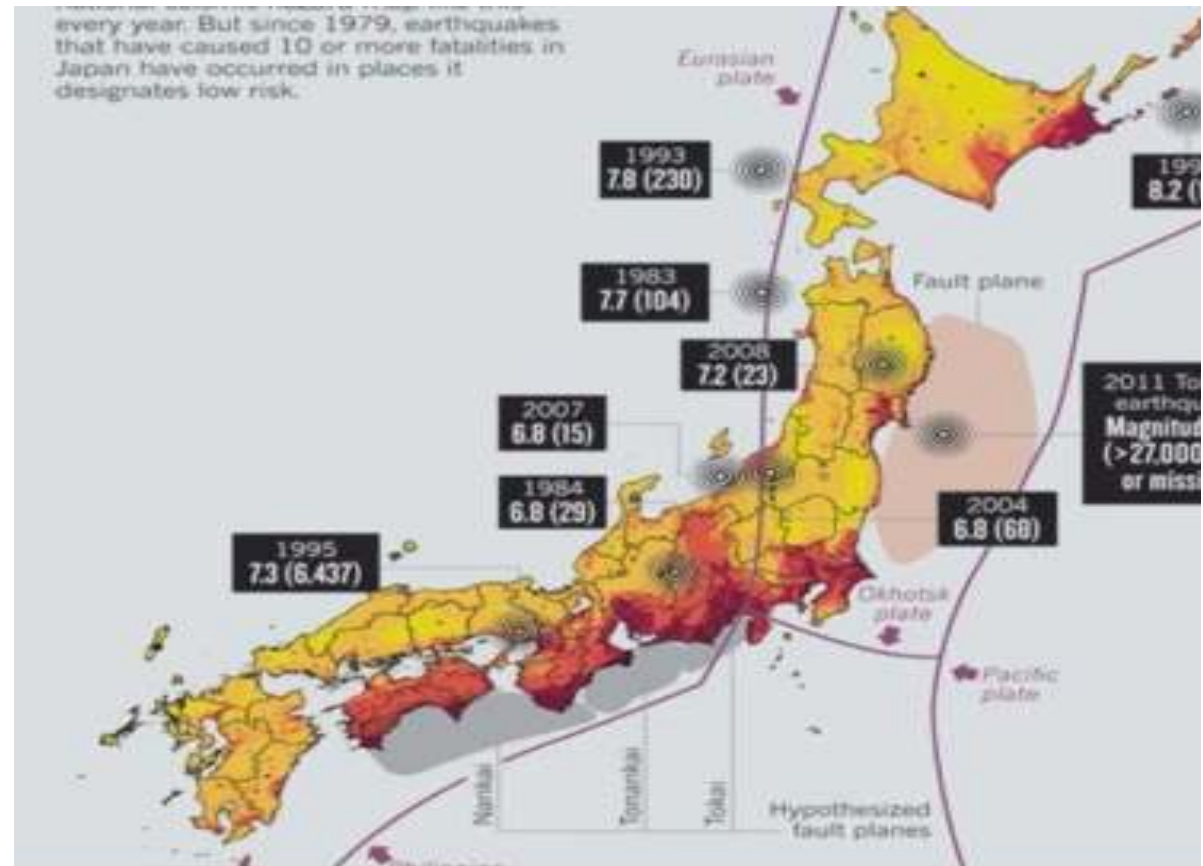
# Mathematical Models

“Once numbers are presented, society believes that a scientific basis has been established. . . .However, those numbers are undependable.”

- scientist Ishibashi Katsuhiko



“Scientific Progress” might mean less faith in predictive models



Scientist Robert Geller, Tokyo University

These are not my unique ideas.

Let me introduce a few books that explain this better and more clearly than I can today . . .

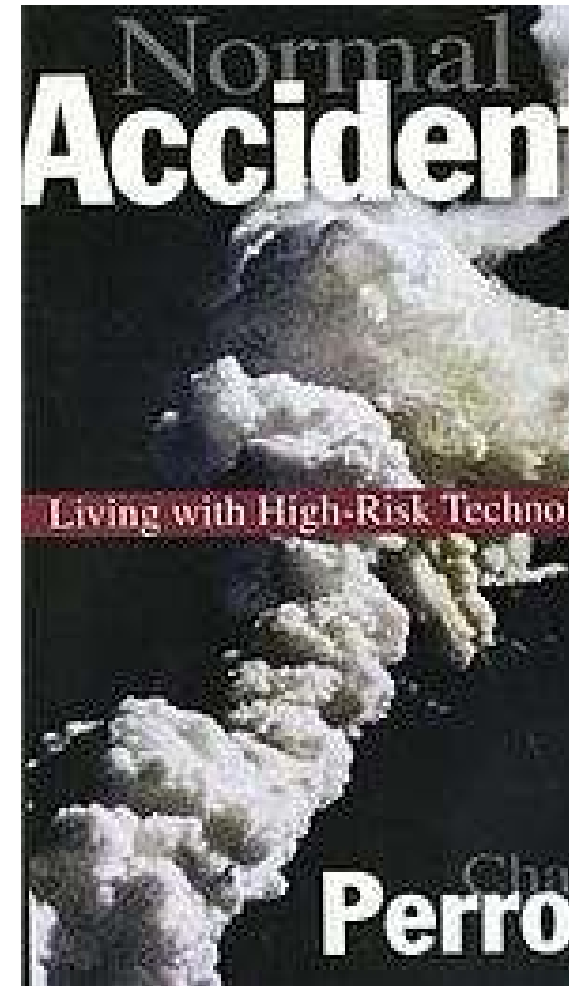


## Charles Perrow's Normal Accidents (1984)

Complexity itself ensures eventual failure

The more complex a system, the more parts, and more people. Hence, the more opportunities for 'component failure'

As our world becomes more high-tech, we should expect more, not less, catastrophic failure

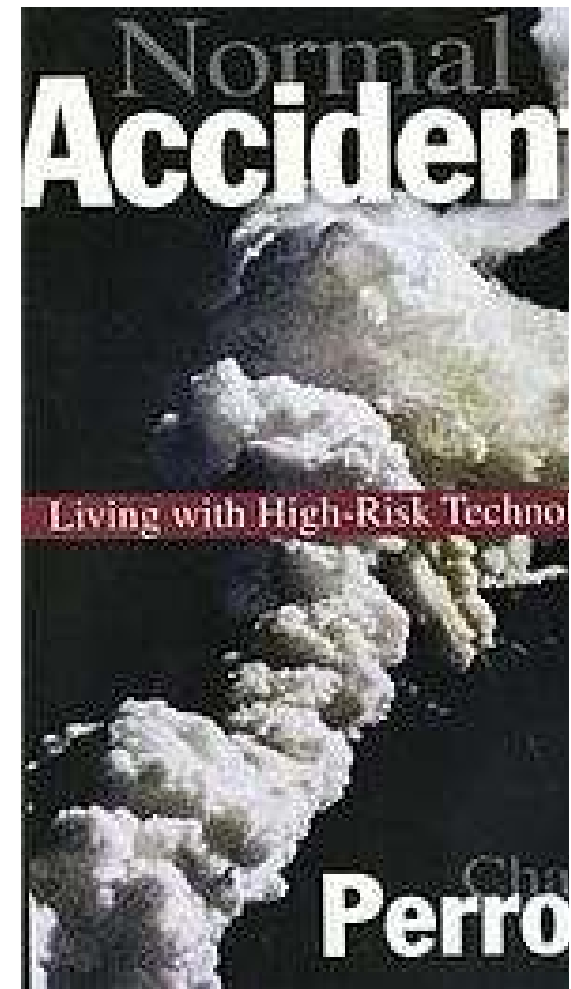


Perrow (cont.)

Human error is more common than we want to believe

Large disasters have small (sometimes invisible or mundane) beginnings

Failures in organization(s) are even more common than failures in technology

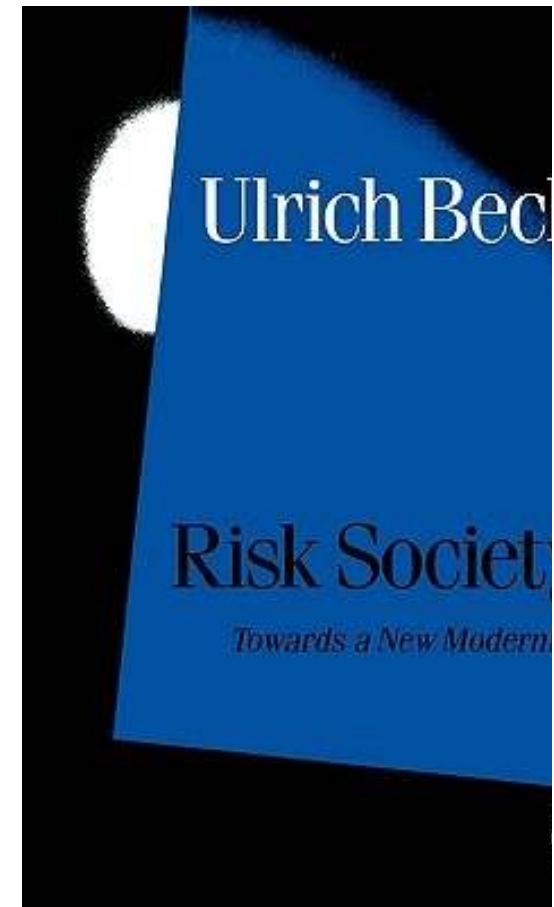


# Ulrich Beck's Risk Society: Toward a New Modernity (1992)

In pursuing predictability, modern society  
has created the notion of 'risk'

Post-modern 'hazards' were translated into  
modern 'calculable risks'

But as risks increase, protection decrease  
(there are too many, and they cannot be fully  
controlled)

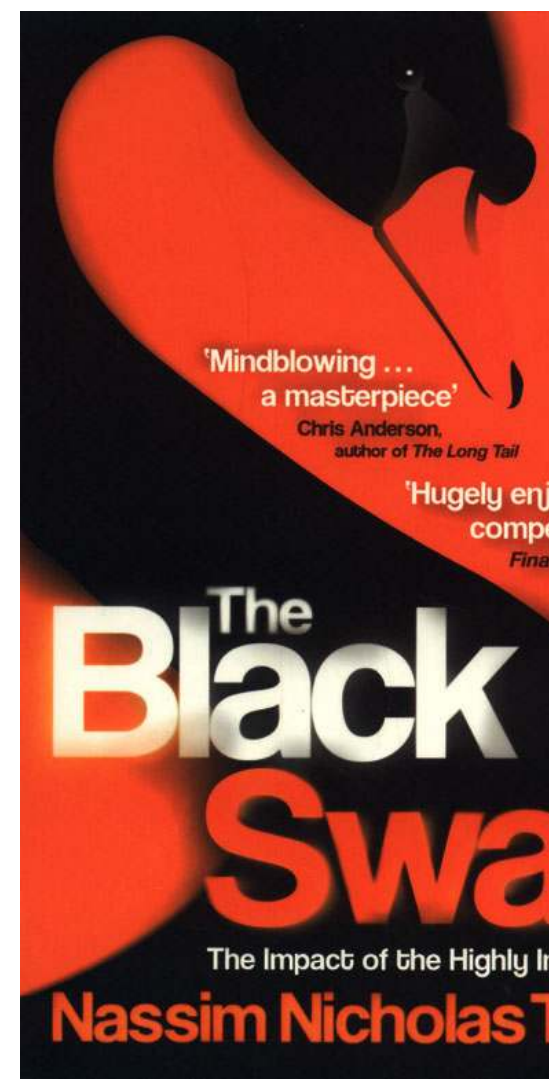


Nassim N. Taleb's The Black Swan (2007)

A black swan is an event “outside the realm of regular expectations, because nothing in the past could convincingly point to its possibility”

Human nature makes us concoct explanations for its occurrence after the fact, making it (retrospectively) explainable and predictable” [but its

history is driven by “black swan events” [low probability, high impact]



# Examples of Black Swan Events



NATURAL



MAN-MADE

Almost any book by a good historian will teach the same lessons, as will many novels

Is this degree of skepticism useful in a medical curriculum?

How predictable are epidemic diseases, or pandemics?

When victims/patients question our (incorrect) predictions, are they 'naïve' ?

Has model-making in science and medicine gone too far? What are the alternatives?

Thank You