

# Does the Royal Navy have enough accidents?

The Modern Warship -  
management of safety in war and peace  
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**Abstract** *Individual* risk management is a balancing act in which the potential rewards of a course of action are weighed against potential adverse outcomes. *Institutional* risk management usually focuses exclusively on risk reduction - the *rewards* of risk taking are systematically undervalued.

Different risks are managed differently. It is important to be clear about the nature of the risk one is dealing with. ***Virtual risks*** are products of the imagination that work upon the imagination. The greater the uncertainty, the more important become the perceptual filters through which the world is viewed.

If people take risks there will, ***by definition*** be accidents; but striving for zero risks in an uncertain world will reduce not only accidents, but rewards as well. In peacetime the navy strives to reduce risks to a level that is as Low As Reasonably Practicable (ALARP). In time of war it is much more conscious of the potential reward of risk taking - ***victory***.

## ***Questions:***

Are the safety objectives of the navy in war and peace in conflict?

Is the safety regime of a peacetime navy compatible with an effective fighting force?

Does the royal Navy have enough accidents?

## Can risk be managed rationally?

The background to the current debate:  
the role of the Royal Society

### Risk Assessment

A Study Group Report

The Royal Society 1983



I will begin my contemplation of these questions with a brief look at the recent history of current debates about risk management.

In 1983 another Royal institution - the Royal Society - produced a report that suggested that such questions can be answered "rationally" and "scientifically".

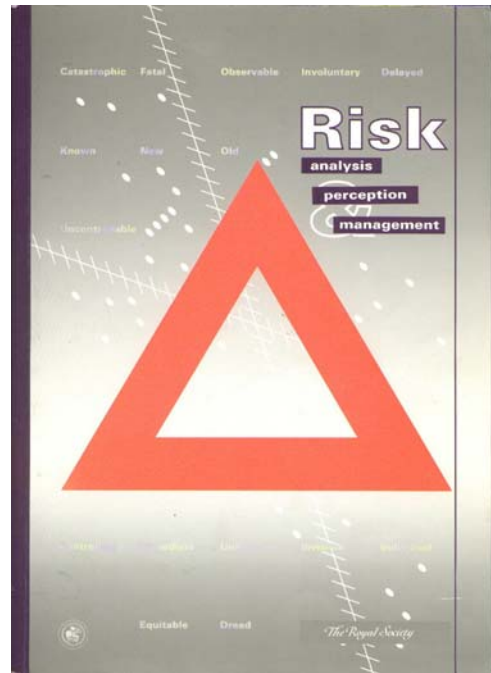
As one would expect of a report emanating from Britain's foremost scientific institution its tone was clear, confident, authoritative and scientific - risk, like the other phenomena that the Royal scientists studied, presented problems that would yield to science

"not a report of the Society"

"a contribution to the ongoing debate"

Risk is "real", "actual" & capable of "objective measurement"

"risk is socially constructed"



Nine years later another working group organised by the Royal Society returned to the subject and produced this document. Many of the same scientists from the working group that produced the earlier report were involved.

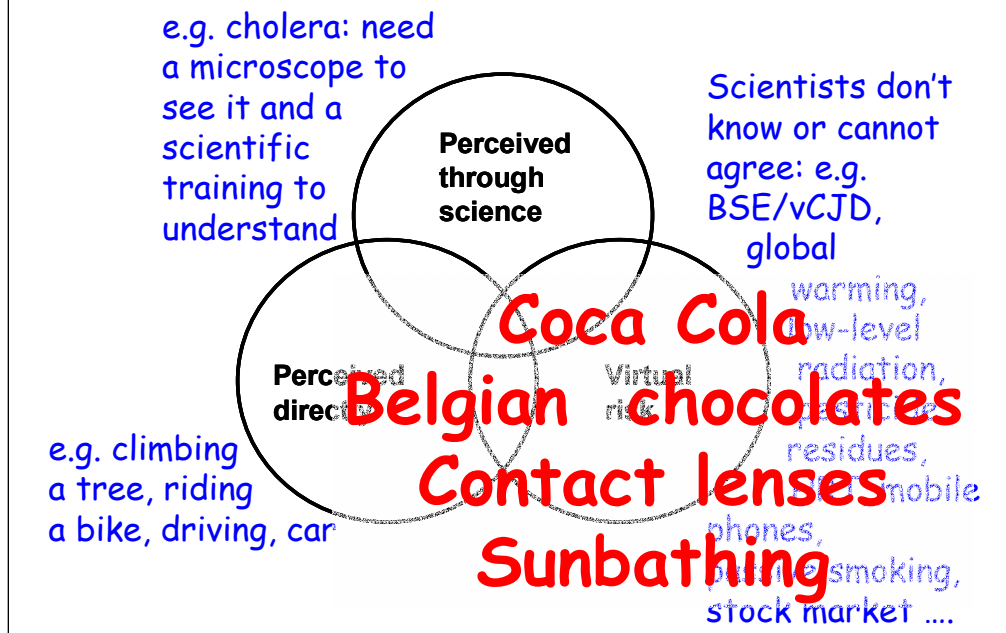
But the result was very different. Despite the appearance of the Royal Society's name on the front cover, the preamble to the report insisted that it was not a report of the society. Rather it was "a contribution to the ongoing debate."

The debate was between the "Royal" scientists and a group of social scientists that they had invited to join their deliberations.

Much of this often acrimonious debate can be made to evaporate if one is careful to be clear about the nature of the risk one is dealing with.

I have found the following distinctions helpful.

# Three kinds of Risk



- **Directly perceptible risk** - eg climbing a tree, riding a bike, driving a car. This category of risk is dealt with instinctively and intuitively. You don't conduct a formal probabilistic risk assessment before you cross the road.
- **Risk perceived through science** - e.g. cholera, you need a microscope to see it and a scientific training to understand what you are looking at.
- **Virtual risk** - the scientists just don't know, or reputable scientists disagree.
- The second category, risks perceptible through science, contained most of the examples deployed by the Royal Scientists in their dispute with the social scientists.
- The third category **virtual risk** is the realm of risk culturally constructed. If science cannot settle an issue it is wonderfully liberating - people, including scientists, are freed to argue from their established beliefs, prejudices and superstitions.
- The list grows unrelentingly, Some new virtual risks that have made the news last summer are Coca Cola, Belgian Choclates, contact lenses and sunbathing.
- I will look quickly at how these three types of risk are managed, beginning with risk directly perceptible

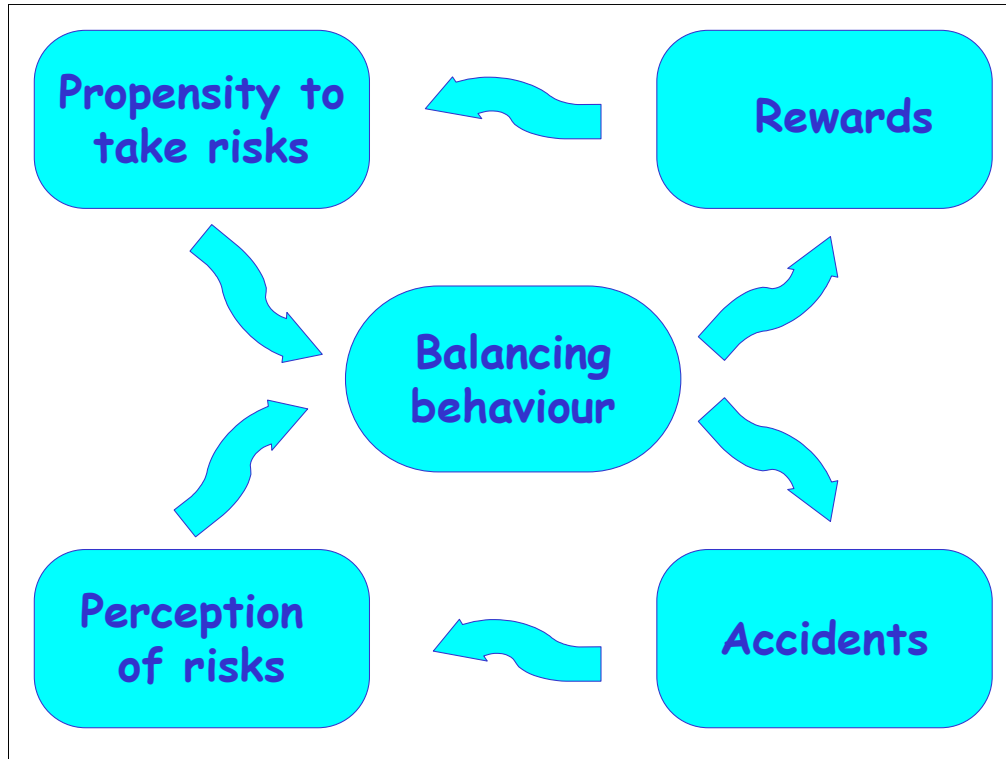
## A successful risk manager



Risk management  
is

- a balancing act
- instinctive
- intuitive
- modified by culture

- I begin with a portrait of a successful risk manager.
- This is an example of primordial risk management
- Anyone who has ever been in the presence of a toddler learning to toddle will be under no illusions about being in the presence of a serious risk management exercise.
- I like this picture because it illustrates a number of attributes of risk management
- **It is a balancing act** - in this case a physical balancing act - but more generally an act in which the rewards of an act are balanced against the potential adverse consequences
- **It is instinctive** - successful risk management has been rewarded by evolution
- **It is intuitive** - we do not undertake a formal probabilistic risk assessment before we cross the road - or toddle across the room
- it is behaviour that is **modified by culture**. This little fellow is clearly performing before an appreciative audience. Desired behaviour is being reinforced.

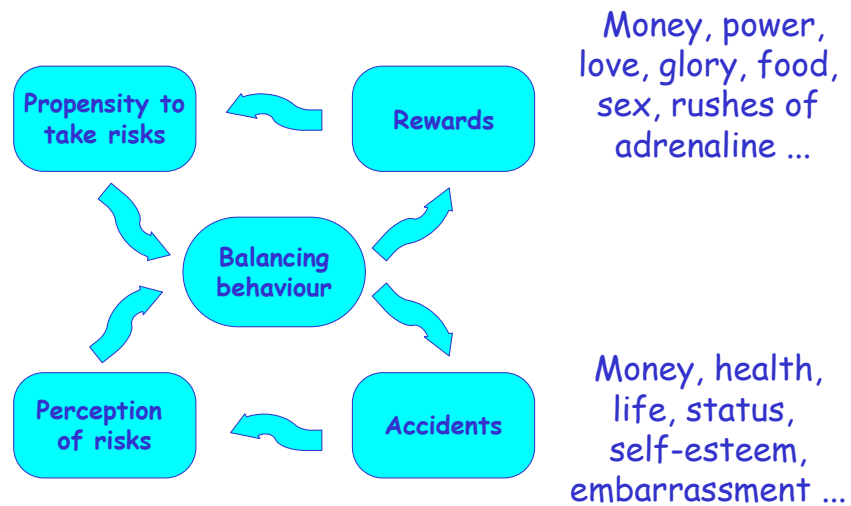


Here we have a more abstract representation of what was going on in the previous slide.

The model suggests

- everyone has a propensity to take risks
- this propensity varies from one person to another
- this propensity is influenced by the rewards of risk
- perceptions of risk are influenced by experience of accident losses -- one's own and others.
- Individual risk-taking decisions represent a balancing act in which perceptions of risk are weighed against propensity to take risks, and
- accident losses are, by definition, a consequence of taking risks; the more risks one takes the greater, on average, will be both the rewards and the losses one incurs.

## The risk thermostat



The model is conceptual, not quantifiably operational.

Both the accidents box and the rewards box contain large numbers of incommensurable variables

# Risk compensation more dangerous & therefore slower

## Groovy, but drivers are unimpressed

WHEN the red lights go out on the starting grid at Melbourne's Albert Park circuit on Sunday, they will herald the start of a season with the biggest change in the sport's technical rules for 15 years.

New regulations introduced this year have opened up a series of doubts about how the racing is going to turn out.

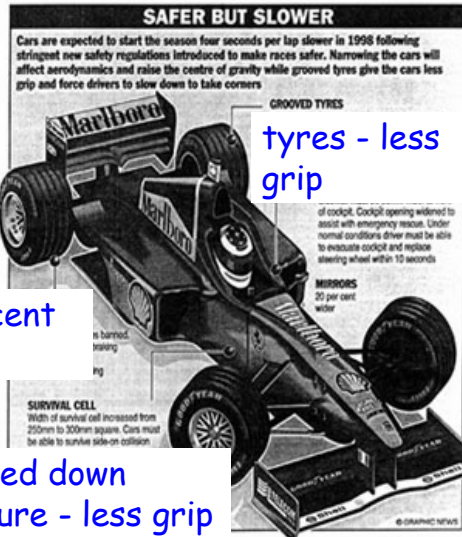
The new cars, which are narrower, have proved to be more of a handful during thousands of miles of winter testing and nobody is quite sure what they will be like when they are racing side-by-side at 200mph.

That is not to say the sport's ruling body have fired a shot in the dark by changing the rules – they had to do something to slow the cars down because, thanks to the Formula One tyre war between Bridgestone and Goodyear, lap times were tumbling by up to six seconds.

The most noticeable change has been the introduction of grooved tyres, which return to the sport for the first time since the late 1960s. The reintroduction will result in less tyre con-

by GORDON HOWARD

less efficient brakes



### SAFER BUT SLOWER

Cars are expected to start the season four seconds per lap slower in 1998 following stringent new safety regulations introduced to make races safer. Narrowing the cars will affect aerodynamics and raise the centre of gravity while grooved tyres give the cars less grip and force drivers to slow down to take corners

GROOVED TYRES

tyres - less grip

of cockpit. Cockpit opening widened to assist with emergency rescue. Under normal conditions driver must be able to evacuate cockpit and replace steering wheel within 10 seconds

MIRRORS

20 per cent wider

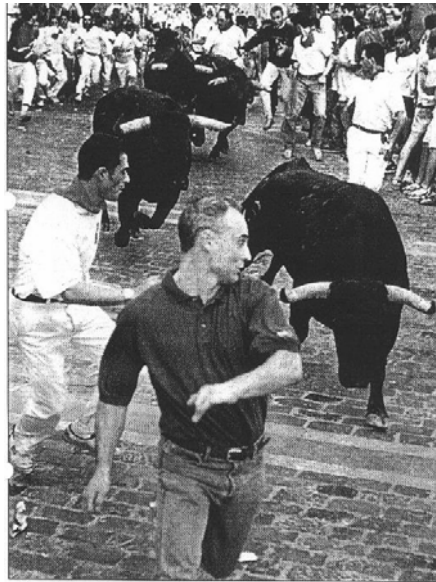
### SURVIVAL CELL

Width of survival cell increased from 220mm to 300mm square. Cars must be able to survive side-on collision

reduced down pressure - less grip

- Let us consider the implications of this way of looking at risk management with a specific example with fairly obvious rewards from risk taking -
- **Formula 1 racing.**
- Since the death of Ayrton Senna there have been numerous changes to the Formula 1 construction rules. Most of these changes, in the terms of conventional road safety policy, have made the cars more dangerous
- The most recent set of rule changes has
  - **made brakes less efficient**, increasing stopping distances
  - **reduced the grip of tyres**, making the car less controllable
  - **reduced the downforce**, also reducing the grip in the road
  - **the sub-heading reads "safer but slower"**
- **I would change this to "more dangerous and therefore slower"**
- The behavioural principle underpinning these changes is known as "**risk compnsation**". The presumption of the rule-makers is that the drivers will notice the change in performance and slow down. The hoped for result is that if they do crash, it will be at a slower, less catastrophic speed.
- This way of looking at risk has profound implications for road safety policy.
- But this is the quick tour, so I will leave you to speculate about what they might be, and move on to my second risk category, **risk perceived through science**





Two participants keep a wary eye on the bulls in yesterday's opening Pamplona run

### Briton hurt in Pamplona bull run

PAUL FLEMING, 25, of London, was one of two people injured yesterday on the first day of the annual running of the bulls in the Spanish town of Pamplona. He was treated

no, 31, a Spaniard, was not as lucky. He was gored and admitted to hospital with a 10in gash in his right leg. The nine-day San Fermin festival has an *encierro* (run)

people have been killed in the runs, the last in 1995 when a 22-year-old American, the only foreigner ever to die, was fatally gored. Before 1924, no records were kept of those

- Here we have an example of risk taking "for the hell of it".
- Frequently neglected rewards of risk taking are excitement, assertion of independence, and thumbing one's nose at authority.

## Risk perceived through science

the role of the Royal Statistical society

- “a Richter scale for risk would involve taking a series of common situations of varying risk to which people can relate” (DoT)
- “a simple measure of risk to that people can use as a basis for decision making” (RSS)

- Advocates of a quantitative/scientific approach to risk management have recently been calling for the development of a Richter Scale for Risk.
- Dismayed by the inability of ordinary people to make sense of information presented in the form of probabilities they propose a scale illustrated by familiar risks, so that when novel risks are presented with probabilities attached people will be able to compare them with risks that they know.

Table 1. Risk of an individual dying (D) in any one year or developing an adverse response (A)

Term used	Risk estimate	Example
High	Greater than 1:100	A. Transmission to susceptible household contacts of measles and chickenpox 1:1 - 1:2
		A. Transmission of HIV from Mother to child (Europe) 1:6
		A. Gastro-intestinal effects of antibiotics 1:10- 1:20
		D. Smoking 10 cigarettes per day 1:200
Moderate	Between 1:100-1:1000	D. All natural causes, age 40 years 1:850
Low	Between 1:1000- 1:10000	D. All kinds of violence and poisoning 1:3300
		D. Influenza 1:5000
		D. Accident on road 1:8000
Very low	Between 1:10000- 1:100000	D. Leukaemia 1:12000
		D. Playing soccer 1:25000
		D. Accident at home 1:26000
		D. Accident at work 1:43000
		D. Homicide 1:100000
Minimal	Between 1:100000- 1:1000000	D. Accident on railway 1:500000
		A. Vaccination-associated polio 1:1000000
Negligible	Less than 1:10000000	D. Hit by lightning 1:10000000
		D. Release of radiation by nuclear power station 1:10000000

Source: *On the State of the Public Health: the Annual Report of the Chief Medical Officer of the Department of Health for the Year 1995*, London, HMSO, 1996, p. 13.

- This is an example produced by the former Chief Medical Officer, Sir Kenneth Calman.
- Road accidents usually feature in such scales because
  - they are in the middle of the range, and
  - they are one of the most familiar risks
- How useful are they as a guide to the significance of a novel risk of 1:8000?

### A Richter Scale for Risk?

Risk of an individual dying in any one year  
as a result of a road accident

= 1:8000 (*On the State of the Public Health 1995*)

= 1:16000 (*Road Accidents Great Britain 1995*)

The diagram illustrates the components of the risk ratio 1:16000. It shows a sequence of numbers and multipliers: 100 X 134 X 10 X 20 = 2 680 000. Arrows point from descriptive text to specific numbers in the sequence: 'Young male vs middle-aged female' points to 100; 'Personality disorder vs normal' points to 10; '3am Sunday vs 10am Sunday' points to 134; and '2.5 times over limit vs sober' points to 20.

$$\begin{array}{ccccccc} \text{Young male vs} & & & & \text{Personality disorder} & & \\ \text{middle-aged female} & & & & \text{vs normal} & & \\ \downarrow & & & & \downarrow & & \\ 100 & \times & 134 & \times & 10 & \times & 20 = 2\,680\,000 \\ & & \uparrow & & & & \uparrow \\ & & \text{3am Sunday vs} & & & & \text{2.5 times over} \\ & & \text{10am Sunday} & & & & \text{limit vs sober} \end{array}$$

- Not very.

- This deconstruction of the number suggests that a disturbed, drunken young man on the road a 3am Sunday is about 2.5 million times more likely to be involved in a serious accident than a normal, sober, middle-aged woman driving to church seven hours later.

- **I exaggerate**

the four variables are not independent;  
there are more disturbed drunken young men on the  
road at 3am Sunday

- **or do I?**

the four numbers in the equation are all **averages**.

Further variables must be invoked to account for their  
variances,

**is the car**

big X new X equipped with ABS brakes X insured ...?

**is the road**

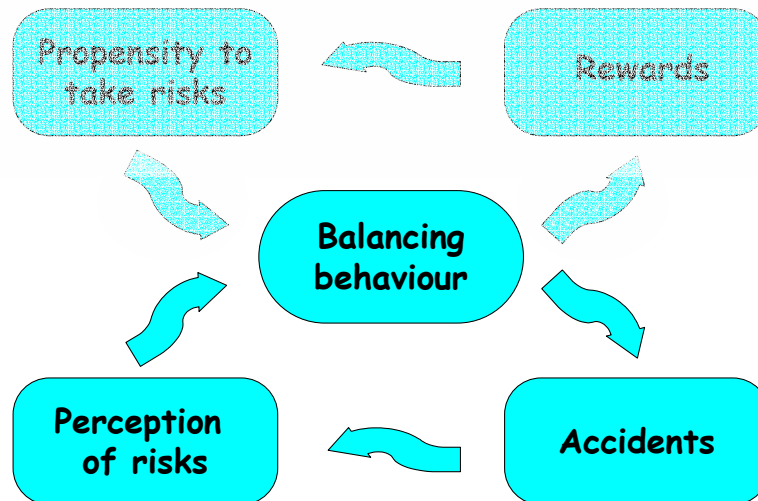
slippery X well-lit X straight ... ?

**is the driver**

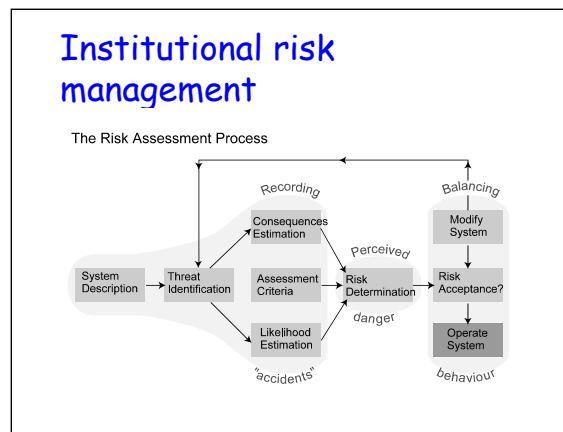
sleepy X angry X on drugs X short-sighted ...?

**is the ... .... ?**

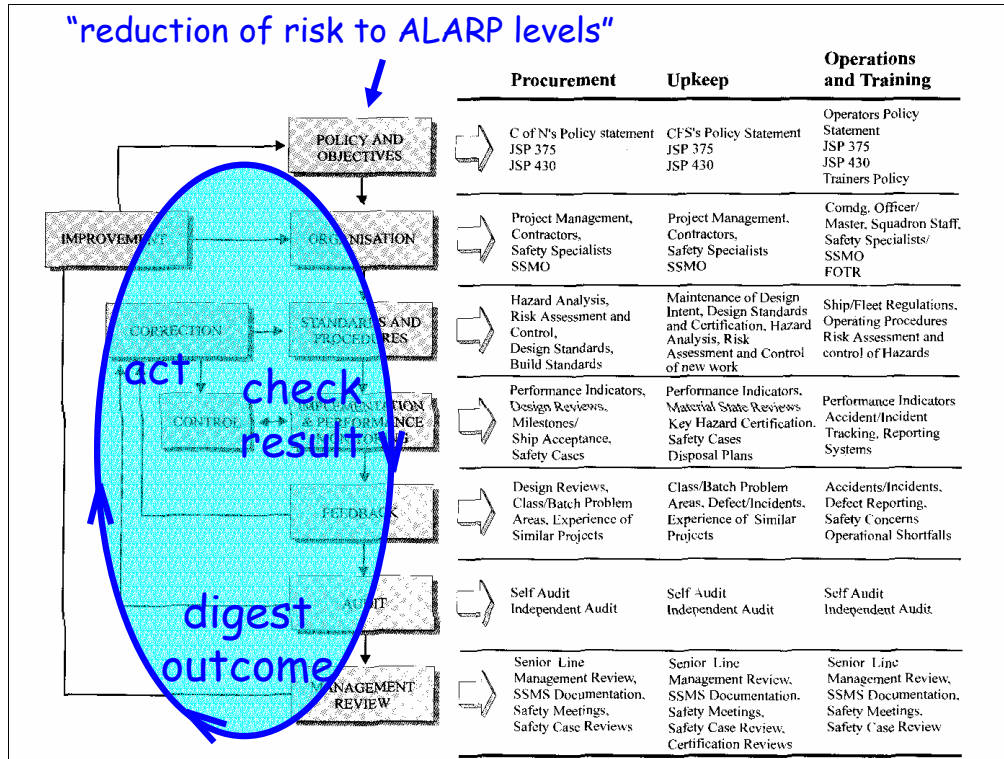
## Bottom loop only



- The individual management of directly perceptible risks - e.g. crossing the road - involves the balancing act described by the risk thermostat model.
- Institutional risk management usually means "risk reduction" - it focuses only on the bottom loop of the model.



- An extremely common problem lies in the way that institutional risk managers define their job or have it defined for them.
- In recent years I have been invited to give a number of seminars to regulators and risk managers working in commerce and industry. Each time before I go I ask them to send me their in-house risk management manual.
- And usually I have been able to find in what I am sent a wiring diagram that looks something like this. The process of risk management is formally set out with boxes and arrows and feedback loops identifying the points in the process at which information is collected and decisions made and the consequences monitored.
- And each time I have been able to demonstrate to them, with my shaded overlays that, in essence, their risk management procedures can be reduced to the bottom loop of my risk thermostat model.
- Risk management, in institutional settings, usually means risk reduction.
- As individuals, we manage risk by balancing risks and **rewards**, but the task of institutional risk managers is to reduce accidents.
- At one seminar when I had this slide on the screen one of the risk managers present exclaimed - "So that's why we were known as the sales prevention department."
- When I ask who in the company is in charge of the top loop, the answer - after a bit of head-scratching - is usually the marketing department.
- And when I ask to see the wiring diagram containing both loops, and identifying the person responsible for the overall balancing act, no one can produce it.
- I believe that this helps to explain why the job of the sales prevention department is not always a happy one. They are charged with managing the behaviour of people who have top loops. **Whenever the safety managers insist on more precaution than individuals judge necessary there is likely to tension, resentment and frustration.**

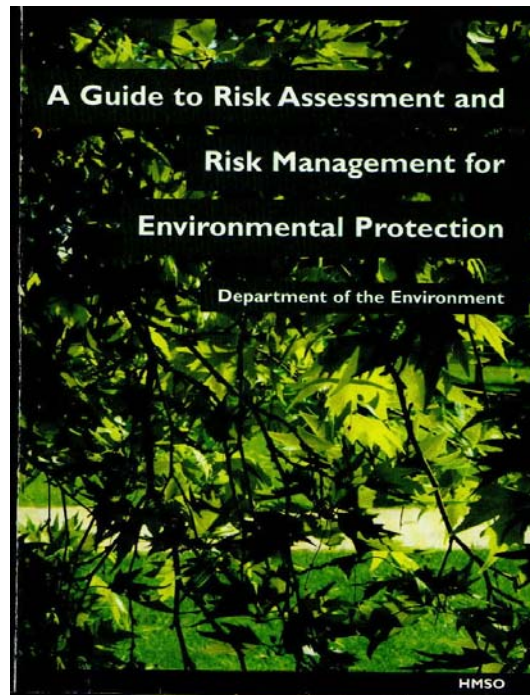


This diagram is taken from the Navy's Ship Safety Management Manual. It also is essentially a bottom loop model.

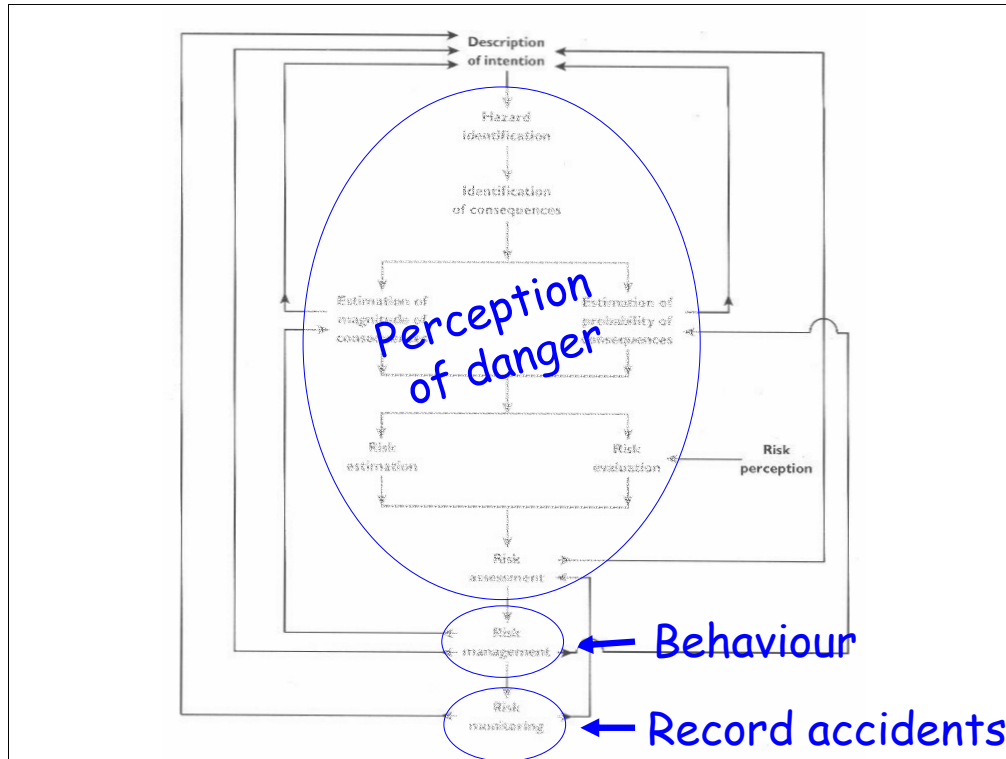
ALARP - As Low As Reasonably Practicable - is the risk target level insisted upon by the Health and Safety at Work Act of 1974.

In peacetime it seems that the Navy requires its captains to run their ships like conscientious factory managers.





Another part of Government that sees risk management as the pursuit of risk reduction is the Department of the Environment.



From p39 of *A Guide to Risk Assessment and Risk Management for Environmental Protection* (Department of the Environment 1995)

The Department's Guide contains a diagram of the process of risk management which also can be reduced to the bottom loop of the risk thermostat model.

## A SIMPLISTIC ILLUSTRATION OF THE PRINCIPAL TERMS

**Intention:** to leave Nelson's column in place as it is, unless a risk assessment reveals intolerable risks.

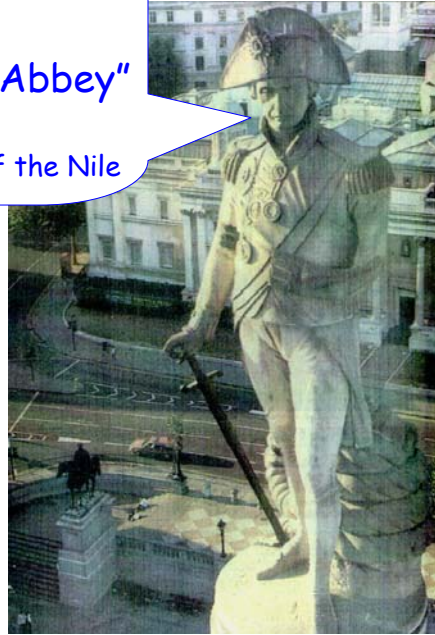
One **hazard** is that stones of a particular size and weight under certain circumstances might be dislodged and fall; a consequence is that a passer-by might be struck and killed or injured by falling masonry.

**Risk estimation** might follow the lines that the probability .... etc

It provides an illustration of the application of its model that has ironic relevance to the navy.

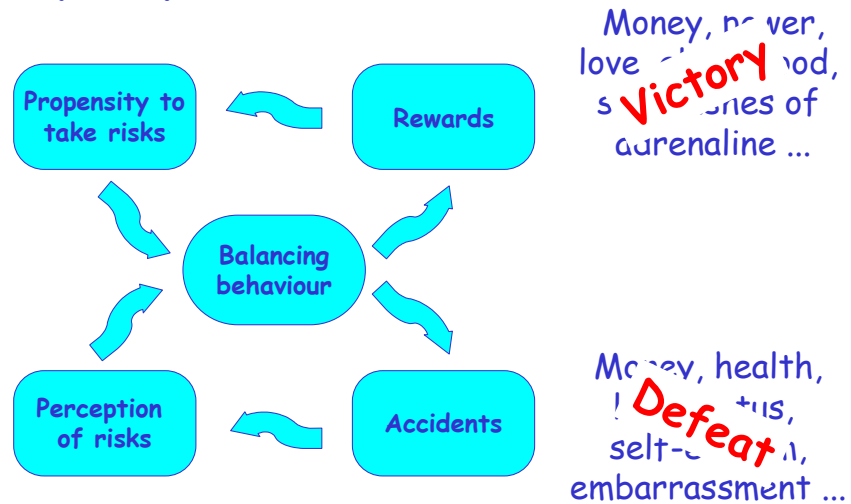
"Before this time tomorrow  
I shall have gained a  
peerage or Westminster Abbey"

Nelson before the Battle of the Nile



Admiral Nelson is Britain's most notorious risk taker. Here he is atop his column in Trafalgar Square - missing an arm and an eye to prove it. He most definitely had a top loop.

## Does the Royal Navy exist only to prevent accidents?



From the Navy's Ship Safety Management Manual one might suppose that the Navy exists only to prevent accidents.

Missing from its characterisation of its risk management problem is the principal reward of risk taking.

"In the event of imminent threat of hostile action or other emergency of similar severity specific safety criteria and principles may be waved if, in the judgement of the responsible authority, the risks or penalties associated with their observance outweigh the safety benefits." (para. 4.71)

The manual does, however concede that there may be circumstances in which other considerations might permit a responsible authority to override its prescriptions.

In war, what is "reasonable" or "practicable" is likely to be redefined.

I paraphrase - "In battle the captain can throw this manual overboard and use his judgement" - in battle the captain is liberated to become a true risk manager - liberated to perform the risk management balancing act.

I will come to the problem of how this balancing act might be performed in a minute - but first I turn to my third category of risk - virtual risk.

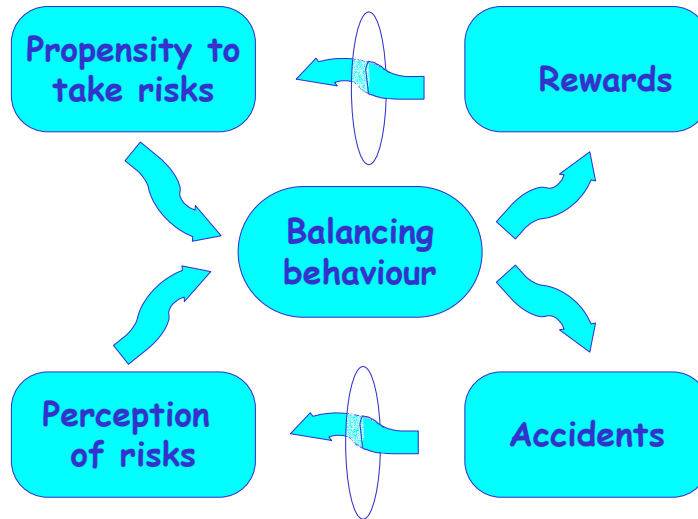
## A virtual risk: vCJD from BSE?

"I have worked in this field for 25 years ... did I go out and eat lamb chops, did I go out and eat lamb brain, sheep brain? The answer was 'no', but it was not based on scientific criteria, it was based on just emotion. ... At a scientific level I cannot give you a scientific basis for choosing or not choosing beef, because we do not know the answers."

*Nobel Laureate Stanley Prusiner  
BSE Inquiry, 6 June 1998*

- Because time is short I will confine myself to a single example - BSE and its possible connection with vCJD.
- A scientific consensus appears to be emerging in support of the hypothesis that vCJD is caused by eating BSE infected meat.
- But this consensus received a bit of a knock last June when Stanley Prusiner gave evidence to the BSE inquiry. Prusiner, by virtue of his Nobel prize for his work on prions, arguably outranks all the other scientists in the debate.
- In his evidence he declared himself unconvinced by the evidence so far produced that a connection had been established.
- He was asked if he had changed his diet since learning of BSE. This is what he said.
- For me, that fact that he has been unable to establish a connection after 25 years looking is reason enough to put it a long way down my personal list of things to worry about. For Prusiner, the possibility seems to be reason enough not to eat lamb.
- So what do we do, what should we do, when confronted with scientific uncertainty such as this?

## Perceptual Filters

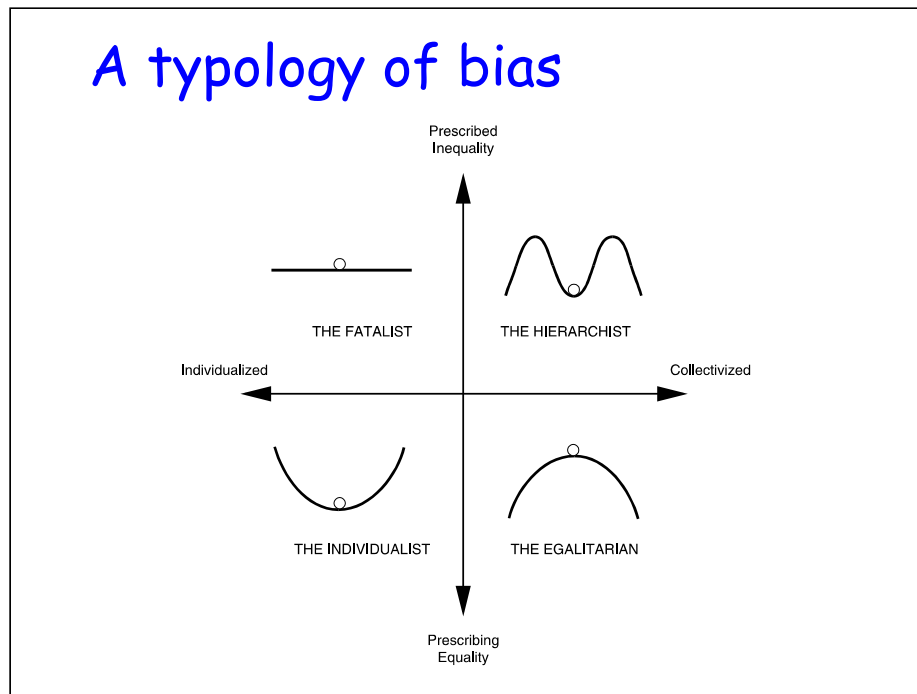


First we should recognise that everyone contemplating a virtual risk perceives it through a perceptual filter.

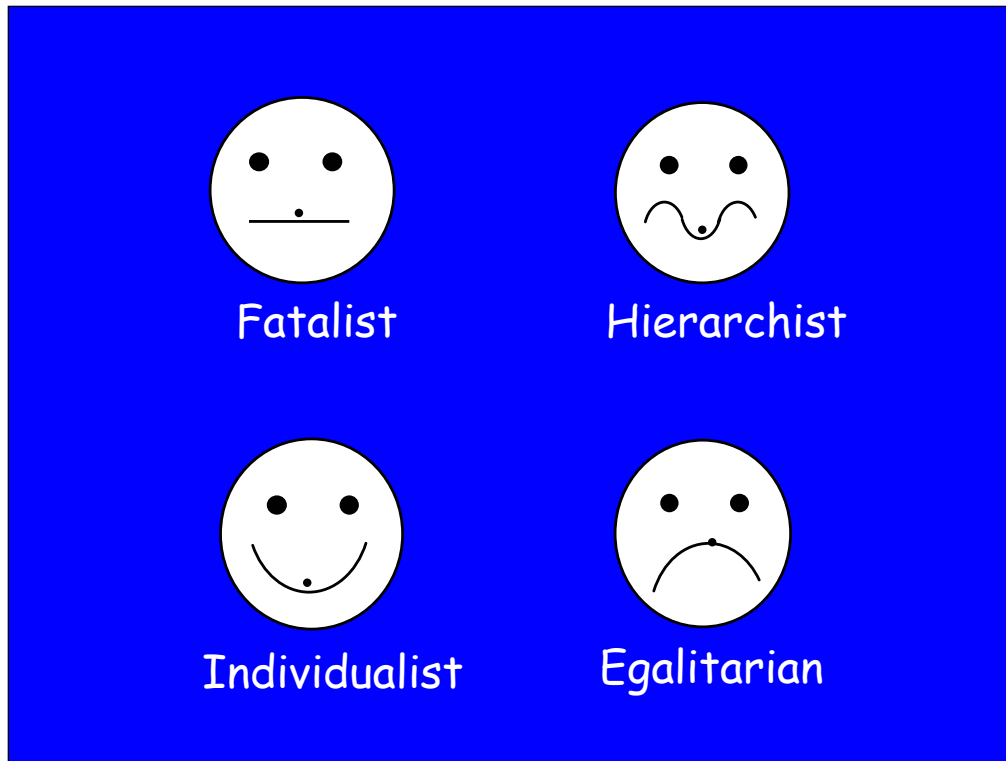
The less certain the science, the more important becomes the influence of the filter in determining what is actually seen.



# A typology of bias



- This is a typology that I have borrowed from a friend, Michael Thompson, that I have found extremely useful in trying to make sense of debates about virtual risks.
- Time is short so I will take you through it very quickly.
- First the icons. In the lower left hand corner we have a ball in a cup. You can shake it about and the ball always comes back to rest safely in the bottom of the cup. This icon represents **the myth** of nature benign, nature stable, nature robust.
- In the lower right we have a ball balanced precariously on an overturned cup. This represents the **myth** of nature fragile and precarious.
- Top left we have nature unpredictable.
- Top right represents nature trustworthy and reliable **within limits** - but be careful not to knock the ball over the rim.
- These are referred to as four **myths** of nature - to stress the point that, in debates about virtual risks to health and the environment, we frequently cannot be sure which to believe.
- There is a **cultural typology** that Thompson showed maps on to this rather neatly. On this graph, toward the left, **cultures** become more individualistic; toward the right, more collectivist in ethos; toward the top, more governed by inherited status and prescriptive rules; and toward the bottom, more democratic.
- In the lower left we find a character known as the individualist
- In the lower right the egalitarian
- Top left the fatalist
- Top right the hierarchist



- These are caricatures, but nevertheless recognizable types that one encounters in debates about risks. With a little imagination you can begin to see them as personalities.
- The **individualist** - optimistic, confident, pragmatic - a gambler because you are likely to win more than you lose. Not much concerned about threats to the environment
- The **egalitarian** - or environmentalist - treads lightly on the earth and invokes the precautionary principle at every turn.
- **Fatalists** - have little control over their lives - *que sera sera*
- **Hierarchist** - here we find the institutional risk managers; big business, big government, big bureaucracy. They employ all the people in white coats to work out where the critical thresholds lie, and economists to devise optimal strategies for living within them.
- The **Hierarchist** sees nature as something to be exploited for his benefit; the **Egalitarian** sees nature as something to be obeyed and respected and interfered with as little as possible; the **Hierarchist** sees nature as a management problem. And the **fatalist** ducks if he sees something about to hit him
- They are certainly recognisable in the debate about BSE. Lets look at a few examples in the form of quotations that I have abstracted from the debate.



## Egalitarian

- Feeding dead sheep to cattle, or dead cattle to sheep, is “unnatural” and “perverted”.
- “It is the full story of the beginnings of an apocalyptic phenomenon.”
- “Great epidemics are warning signs, symptoms of disease in society itself.”

- The egalitarian sees BSE as punishment for unnatural, hubristic methods of industrial agriculture.
- The last two quotations come from the foreword to Richard Lacey's book on BSE
- The problem is embedded in an apocalyptic societal context.
- **If you cannot prove beef is safe, assume it is dangerous.**



## Individualist

- “The precautionary principle is favoured by environmental extremists and health fanatics. They feed off the lack of scientific evidence and use it to promote fear of the unknown.”
- “It is clear to all of us who believe in the invisible hand of the market place that interference by the calamity-promoting pushers of the precautionary principle is not only hurtful but unnecessary.”

- The individualist views industrial agriculture as a boon to mankind, and CJD as an extremely rare disease whose connection with BSE is unproven.
- Hostile to regulation. Publish everything you know and let the shopper decide.
- **If you cannot prove beef is dangerous, assume it is safe.**



## Hierarchist

- “We require public policy to be in the hands of elected politicians. Passing responsibility to scientists can only undermine confidence in politics and science.”
- “I have not got a scientific opinion worth listening to. My job is simply to make certain that the evidence is drawn to the attention of the public and the Government does what we are told is necessary.”

- In the case of BSE the ball has gone over the rim. The hierarchy is acutely embarrassed.
- The ball has become a hot potato, to be passed on to someone else as quickly as possible.
- The second quotation is Stephen Dorrel explaining that he was only obeying orders.
- **Whatever you do make sure you adhere to precedent and obey the rules.**

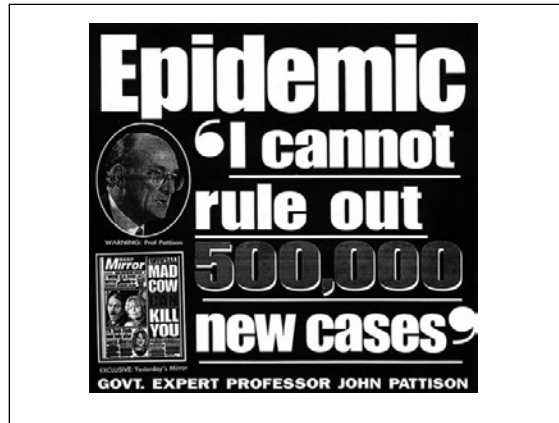


## Fatalist

“They should shoot the scientists, not cull the calves. Nobody seems to know what is going on.”

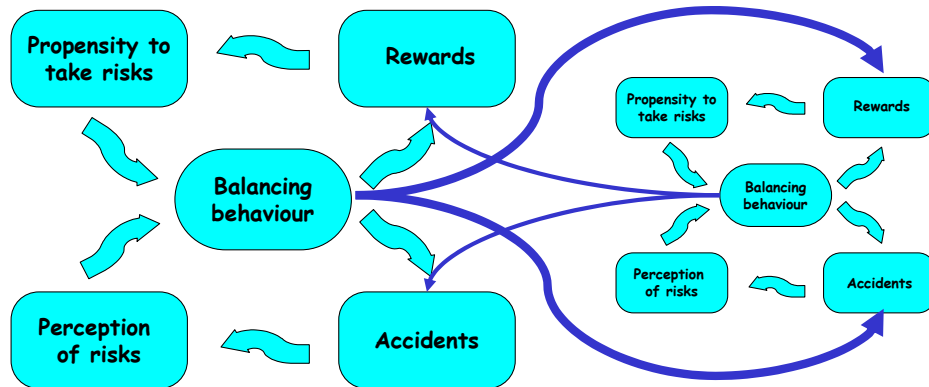
- **“Charles won’t pay for Diana’s briefs”**  
Main headline in *The Sun* on 21.3.96, the day every other newspaper in the country led with the BSE story

- A dairy farmer on the verge of bankruptcy.
- The Sun is **the** fatalists newspaper.



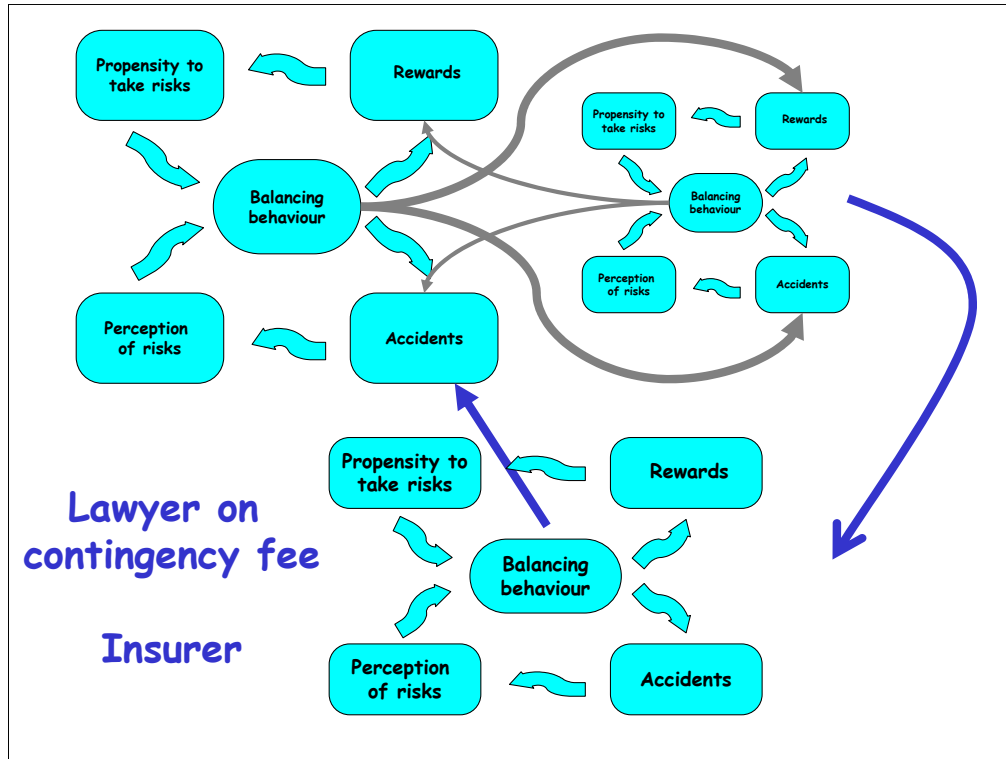
- Some scientists, such as Richard Lacey, offer us very alarming hypotheses, others are much more reassuring.
- A scientist, such as Prof Pattison, saying "dunno" in the face of great uncertainty, and contending hypotheses is a bit like one of those Rorschach ink blots that psychologists used to use. Some will look at "dunno" and see a happy smiling face, and others will see one that is dire and threatening.
- How well do these categories fit the Navy?
  - All armed services are notoriously hierarchical and hierarchies are notoriously risk averse. They place great emphasis on rules and adherence to them, and on clearly defined chains of command for their enforcement.
  - Most of the famous heroes of military history - like Nelson - have been individualistic risk takers - routinely at odds with the hierarchy.
  - Most conscripts - especially those in the trenches during WWI - incline to fatalism.
  - Egalitarianism does not fit comfortably with the militaristic ethos. Egalitarians are occasionally recognised for acts of altruistic heroism, sometimes are pacifists or conscientious objectors, and sometimes provide the ideological justification for war, but they do not respond readily to either the demands of the hierarchy or the charisma of individualistic leaders. Their preoccupation with procedural "fairness" is usually swept aside in times of conflict, but in peacetime - as in the modern German army - can produce challenges to military tradition.

## The lorry driver and the cyclist



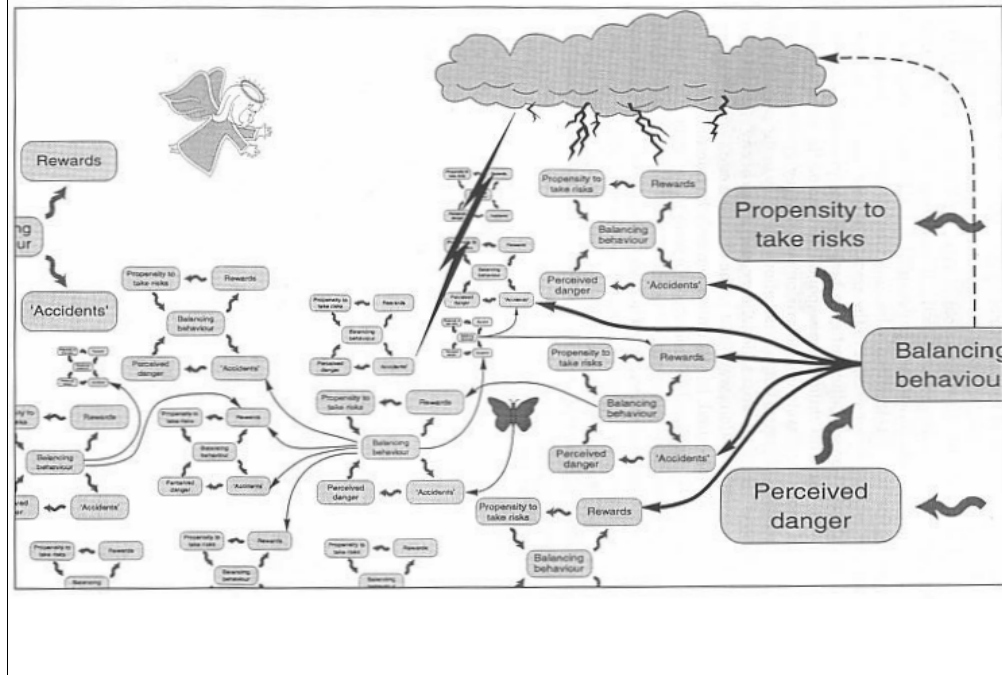
- Up until now I have been discussing risk management as though it involved an individual pitting his wits against his environment. But risk is almost always an interactive phenomenon - and frequently the interaction is not between equals.
- And in war the interaction is between risk managers who are actively seeking to harm "the enemy".



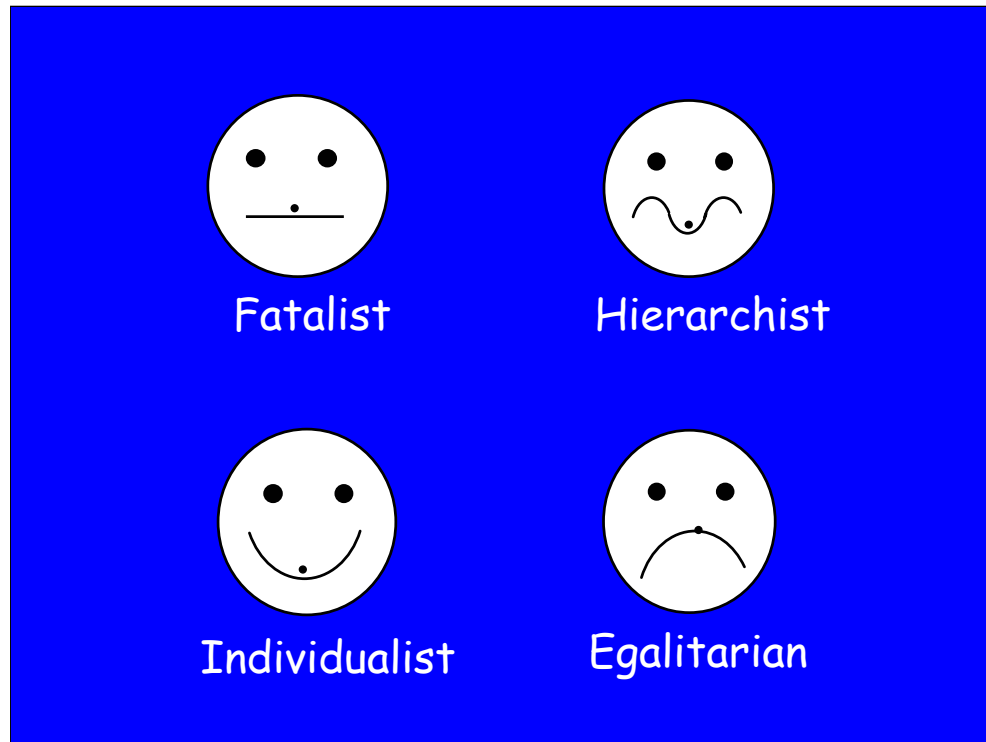


- An added complication in peacetime is the increasing litigiousness of society - increasing the pressure to ensure that War Games are casualty free.
- Reality, of course is vastly more complicated.

## The Dance of the Risk Thermostats



- In the world today there are now 6 billion risk managers - 6 billion thermostats.
- They range from presidents and CEOs of multinational companies to small children chasing balls across streets. They are all part of a highly complex and reflexive system.
- Over hanging all of them are natural hazards - storms, floods, earthquakes, asteroids ...
- Fluttering amongst them is the Beijing Butterfly spreading Chaos.
- The angel represents the belief of many in divine intervention in human affairs - a belief which, despite its unverifiability - has a significant effect by virtue of the fact that large numbers act upon it.
- Amongst them are also found armies, navies and airforces, terrorists and free-lance psychopaths - risk managers pursuing agendas that are frequently in conflict.
- Virtually all of the risks that they are managing belong to my virtual category - i.e. characterised by great uncertainty. They resist reduction to problems that can be modelled by computers.
- This is perhaps why the great strategists of military history were brilliantly intuitive, rather than punctiliously bureaucratic.



- Let's try using this typology for considering our starting questions

*Are the risk management objectives of the navy in war and peace in conflict?*

*Is the risk management regime of a peacetime navy compatible with an effective fighting force?*

*Does the royal Navy have enough accidents?*

Conventional, peacetime, risk management appears, from my reading of the Navy's Ship Safety Management Manual, to be the preserve of the "sales prevention department". It is hierarchical and highly risk averse.

In wartime more risks must be taken, and the risk-management skills and aptitudes in greatest demand are those of the *individualist*: the hot-shot pilot, imaginative strategists and tacticians untrammelled by conventional rules,

The management of the bottom loop does not appear to be systematically related to the top loop - the pursuit of the reward of victory.

# Not ALARP but

## Groovy, but drivers are unimpressed

WHEN the red lights go out on the starting grid at Silverstone's Albert Park circuit on Sunday, they will herald the start of a season with the biggest change in the sport's technical rules for 15 years.

New regulations introduced this year have opened up a series of about how the racing is going out.

The new cars, which are expected to be more of a test and nobody is quite sure they will be like when they are side-by-side at 200mph.

That is not to say the sport's body have fired a shot in the air: changing the rules - they have something to show the cars because, thanks to the Formula 1 tyre war between Bridgestone and Goodyear, lap times were tumbled up to six seconds.

The most noticeable change has been the introduction of grooved tyres, which return to the sport for the first time since the late 1960s. The restriction will result in less tyre in con-

by GORDON HOWARD

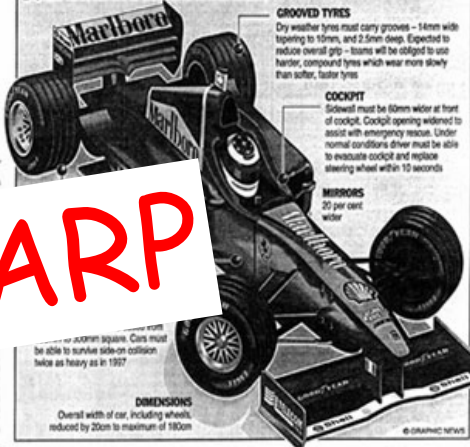
tact with the track and therefore less grip. The narrower

# AHARP

front wing, which was widened last year, when Michael Schumacher tried to drive Jacques Villeneuve off the track, he said, "what is the point of making the cars and trucks a lot safer and spending all this money when drivers are going to crash into each other deliberately?"

### SAFER BUT SLOWER

Cars are expected to start the season four seconds per lap slower in 1998 following stringent new safety regulations introduced to make races safer. Narrowing the cars will affect aerodynamics and raise the centre of gravity while grooved tyres give the cars less grip and force drivers to slow down to take corners



There is no such thing as a successful Formula 1 driver who does not regularly have accidents in pursuit of victory - both in practice (peacetime) and while racing (at war).

Are the safety constraints applied to the navy in peacetime equivalent to insisting that Formula 1 teams strive never to have accidents in practice?

In war is ALARP exchanged for AHARP? That Formula 1 racing and war involve risks is obvious. Is the risk level that the participants settle for in pursuit of victory As *High* As Reasonably Practicable - with Reasonably Practicable being some level just short of suicidal?

### Further thoughts

Beaven's keynote address to this conference suggests that the application of the ALARP principle to the activities of the MoD is a relatively recent phenomenon. Does risk aversion increase as the duration of peace lengthens?

The reluctance of the American Government to expose its personnel to the possibility of any casualties during its activities in Kosovo suggests that we now have a new concept - "The Peacetime War" - a war conducted under the ALARP banner.



Napoleon, like Nelson, had a top loop. He had a preference for generals who were lucky. Confronted by virtual risk one should

**Be careful!** But above all

**Be Lucky!**