Christians in Science meeting, 17th May 2003

RISK

Abstracts

Assessing Risk: Science or Art?

Professor Derek Burke

Abstract of a presentation to the 2003 Christians in Science Sheffield Conference.

There was an excellent Science Minister a few years ago who wanted a 'Richter scale of risk'; an agreed figure that we scientists could give him that would accurately represent risk, and which would be accepted by all. This was an impossible dream. Why? After all, once upon a time, all we scientists had to do was to decide whether a novel food, a novel medicine, a novel technology was safe or not and the public would accept what we, the experts said. We knew best. But times have changed. Because of BSE, because of nuclear power station accidents, because of damage to the environment, science and scientists are no longer trusted as they were. What has happened? Is there anything that we can we do about it? In particular what have we to offer as Christians?

At one time, all we thought we had to do was a technocratic assessment of risk: a purely technical process that arrived at a figure, often a negative power of ten, and expressed all risks on the same scale We very soon discovered that the way that we scientists see risk was different from the way the consumer sees risk, for example over so called GM foods. Value systems are different and since we cannot make decisions for the consumer; we had to widen the regulatory process; consumers had to be involved and were.

Then there were ethical issues. We very quickly found that some risks which seemed perfectly acceptable to scientists were unacceptable to consumers because of ethical concerns. Ways of identifying and dealing with such concerns had to be found, and were.

The next development was the use of the precautionary principle, but the problem there is that it can be interpreted in so many different ways. At its most extreme, it means that no risk however small is acceptable, and that of course means that we would never introduce any new technology. So how do we weigh risks which are as yet undefined? What about "unknowns" and "unknown unknowns"? And how do we weigh risks against benefits?

Finally, we now have to recognize societal influences, so we are in the process of opening up the risk assessment process, widening membership of committees, publishing the agenda, publishing Minutes, meeting in public, using much wider consultation about difficult issues, all to rebuild confidence in the outcome. The process is not easy to work.

Finally what are we to say as Christians? Many of the concerns that face new technologies arise because people think they are "unnatural". There is in society a widespread romantic view of nature which sees everything "natural" as good and any thing tampered with by man as bad. I think that this is because, in an age of widespread unbelief, what is "natural" becomes the "good". We worship the Creator of the natural.

Finally what are we to about the loss of trust - in science and scientists? Society cannot function without some trust. Trust too is central to Christian faith: trust in God and trust in each other is a pillar of faith. We who live in a cynical society have to demonstrate that trust is still reasonable and workable, and live lives of integrity.

Risk in the Scientific Process

Professor Tom McLeish

Abstract of a presentation to the 2003 Christians in Science Sheffield Conference.

Risk in science today enters a many levels. For the working scientist today the most immediate is *not* "will this project work" but, "will my efforts in preparing this grant proposal be commensurate with the likelihood of getting it funded?" The current ethical construction of peer review is shot through with examples of risk making and risk taking, some of them paradoxical in official moves to *enshrine* risk. Doing theology of science is also a risky business. We are far from the texts, but a re-visiting of "science" as "natural philosophy" opens up a richer biblical seam of wisdom literature that inform a process of "reconciliation to the physical creation", including its inherent risk. We find an expectation of pain and failure implicit in this story.

Setting the current research climate against the backdrop of biblical and early-church (we have time for one example - Gregory of Nyssa's *On the Soul and the Resurrection*) material suggests some counter-cultural consequences of the Gospel.

Health, safety and ergonomics

Dr Andrew DJ Pinder

Abstract of a presentation to the 2003 Christians in Science Sheffield Conference

The purpose of this paper is to give an overview of how health and safety professionals deal with risk, to look at how this relates to public perceptions of risk, to give examples from a specific priority area, and to comment on the relationship between the biblical worldview and this view of risk.

Risk is a concept that means different things to different people. The Health and Safety Executive uses the slogan “Reducing Risks - Protecting People”. In this context, ‘risk’ is defined as the probability that someone will be harmed by a hazard. Less precisely, it is often used to mean both the hazard and the harm. In principle, risk can be quantified but, in practice, it is often almost impossible to do so. However, hazards can often be ranked in order of severity of the consequent harm.

The levels of risks that we accept are variable and depend on perceptions of the nature of the hazards and the magnitude and nature of the consequences. In some circumstances we will accept only negligible risk (nuclear power, trains, fairgrounds). Broadly acceptable risks are those which are generally not questioned (e.g., low back pain). Tolerable risks are accepted because the perceived benefits outweigh the perceived costs (e.g., road transport). Other risks are deemed unacceptable (e.g., variant CJD from beef on the bone).

Ergonomics is the study of the relationship between people and the working environment. One aspect deals with issues of health and safety and therefore of risk. One current priority is the area of musculoskeletal disorders. These account for approximately one third of the over 3 day accidents reported to HSE and are a major economic cost. In particular, industrial manual handling is associated with an increased incidence of low back pain. However, 60 - 80% of the population will suffer from an episode of low back pain at some point in their life. Fortunately, it is low severity since most cases get better within a few weeks but it is often recurrent. (It is a curious fact that there are no cases recorded of Jesus healing anyone with simple mechanical low back pain.) Most of the current methods of assessing the risks of manual handling are subjective. The more objective models either estimate risk relative to a standard task or sum absolute risk scores derived from the intensity of particular risk factors.

The Bible does not deal with risk in the way that it is currently understood. However, there are important themes such as dealing with danger and the hazards and costs of being one of God’s people. Unfortunately, there is considerable scope for confusion due to misapprehensions that faith is risky, ranging from the popular cliché “faith is spelt R I S K” to the philosophical arguments of Pascal’s wager and Kierkegaard’s “leap of faith”.

Disclaimer:The views expressed are those of the author and not necessarily those of the Health and Safety Executive".

Risk, Creativity and Innovation

John Ling

Abstract of a presentation to the 2003 Christians in Science Sheffield Conference.

The assessment of "risk" in general and technical management is important. In multinational corporations, educational systems, in meteorology and in the domestic arena, risks are constantly assessed and reassessed.

Huge costs are associated with the failure to manage risk properly. The collapse of WorldCom, Enron and the Mirror pension fund under Maxwell have vividly highlighted the risks that are taken and the importance of assessing in whom we can reasonably put our trust. The recent Higgs report on boardroom governance has highlighted recommendations for reform in the British boardroom in order to manage risk, asserting the need for newly defined roles for non-executive directors.

The development of new and emergent technologies continually brings issues of risk into technology management, for example, legal and commercial factors as well as moral, ethical and spiritual concerns. Increasingly the way these issues are considered has global impact. Companies like Monsanto, who have sought to develop genetically modified foods, have paid a heavy price for the perception of "risk".

It is often said that change involves risk. However the risks of not changing need also to be considered. For example, it is self evident that in recent years there has been a rise in the use of computers and information technology. Therefore it makes sense to include these areas in the traditional school and university curriculum. In the area of meteorology the Kyoto declaration has clearly gone some way to address the risks of standing still and has persuaded many of the need for active management where this is achievable.

Creativity and innovation are closely associated with change. This is because creativity is often seen as value generative. However it is inherently difficult to measure the value of creativity at any given time. It is also clear that not all creativity is helpful or timely. Optimism would dictate that innovation, that is, creativity leading to change in action, might be more useful. Reality, however, more usually informs that the uptake of innovation is dictated by market demand which can be fickle, unprincipled or uneducated. It is therefore argued that the process of taking an idea through development to marketing and commercialisation requires good political and social governance if it is to find a sustainable basis.

The Christian may reasonably assert that they have a moral frame that has lasted the test of time and which follows Christ's example of integrity and discipline. They look, through the hopeful expectation of grace, to implement these principles for sustained, good governance exercised in the spirit of love for the benefit of all nations.