XVIII PTBR National Meeting Satellite Symposium

"Applications of low radiation in medical diagnosis and therapy"

Organized by

Polish Radiation Research Society memorial to Maria Skłodowska-Curie
in collaboration with National Centre for Nuclear Research, Otwock, Poland

Kielce 17/18 September 2019

A Summary and Review

Wade Allison, Oxford

- Interest in low dose radiation reaches from physical science through biology to personal application and social science.
- As this meeting has shown, there is much interesting and pretty good agreement among those working in the field. As far as we are concerned there is nothing obscure or controversial about it.
- **There is no reason to treat radiation and nuclear technology differently from any other agency that brings both harm and benefit.**
- We need to know is what is safe, practically and conservatively, as when setting traffic speed limits and crossing the road.
  Separately, we also need to understand its benefits.
  We do that when crossing the road too.
- In the case of nuclear technology and radiation the record shows that the safety is very good, even if the entertainment industry has found excitement that sells well – but it does that with murder mysteries too.
  Murder mysteries should not influence safety standards.

- There are medical and biological studies that are vital for future applications, and we have heard of these at this meeting [Profs Motherskill, Foray, Slonina, Janiak]
- Prof Cuttler's work may not be successful but he should be praised for his enthusiasm and selfless dedication. His ideas have little competition and so bring much hope.
- These developments Maria Skłodowska-Curie would, I am sure, applaud, if she were here at her eponymous meeting.
- On the other hand I am equally sure that she would be horrified at the widespread phobia of low dose radiation with which she worked all her life.
- Her legacy to the world should play a unique role if we are to rule out the use of carbon fuels. The phobia of low dose radiation throughout society obstructs the health of the planet, in spite of a greater tolerance of radiation for personal health. **This collective immorality, a prioritising of the personal over the social good, should be exposed.**

- After the Manhattan Project Mathematical Physics became king. And very beguiling it is.
- Professor Calabrese has shown at this meeting how this unbalanced the proper development of radiation biology, forcing it to emulate physics.
  Mathematics is supreme in a world of axioms, but is rather impotent in the world of evolution where history, that is the past record, is the determining consideration.
- **Why do we need to know the dose response curve that describes the effect of radiation?**
  It is certainly elusive.
  It is not universal and not reproducible in a useful way, because it depends on history. Only the principles are important – the best that can be done is vague, statistical and forever uncertain. Socol et al have shown how these principles can be described.

Comment from a distinguished scientist 40 years ago that remains valid today

Lauriston Taylor (1902-2004), a physicist. Charter member of ICRP 1928. Founder of NCRP and chairman for 48 years.

In a 1980 lecture he said:

Today [1980] we know about all we need to know for adequate protection against ionizing radiation. Therefore, I find myself charged to ask: why is there a radiation problem and where does it lie?

No one has been identifiably injured by radiation while working within the first numerical standards [equivalent to 734 mGy/yr] *set by the NCRP and then the ICRP in 1934.*

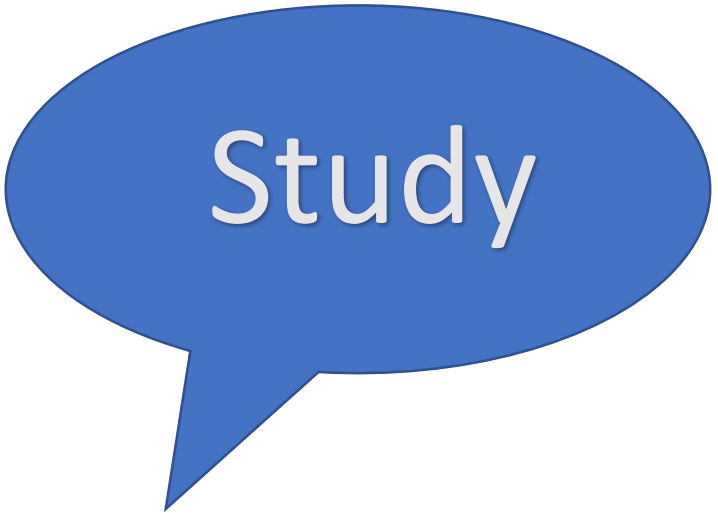
An equally mischievous use of the numbers game is that of calculating the number of people who will die as a result of having been subjected to diagnostic X-ray procedures. An example of such calculations are those based on a literal application of the linear non-threshold dose-effect relationship, treating the concept as a fact rather than a theory. ... These are deeply immoral uses of our scientific knowledge.

Why does society at large not appreciate the benefits? What should we do?

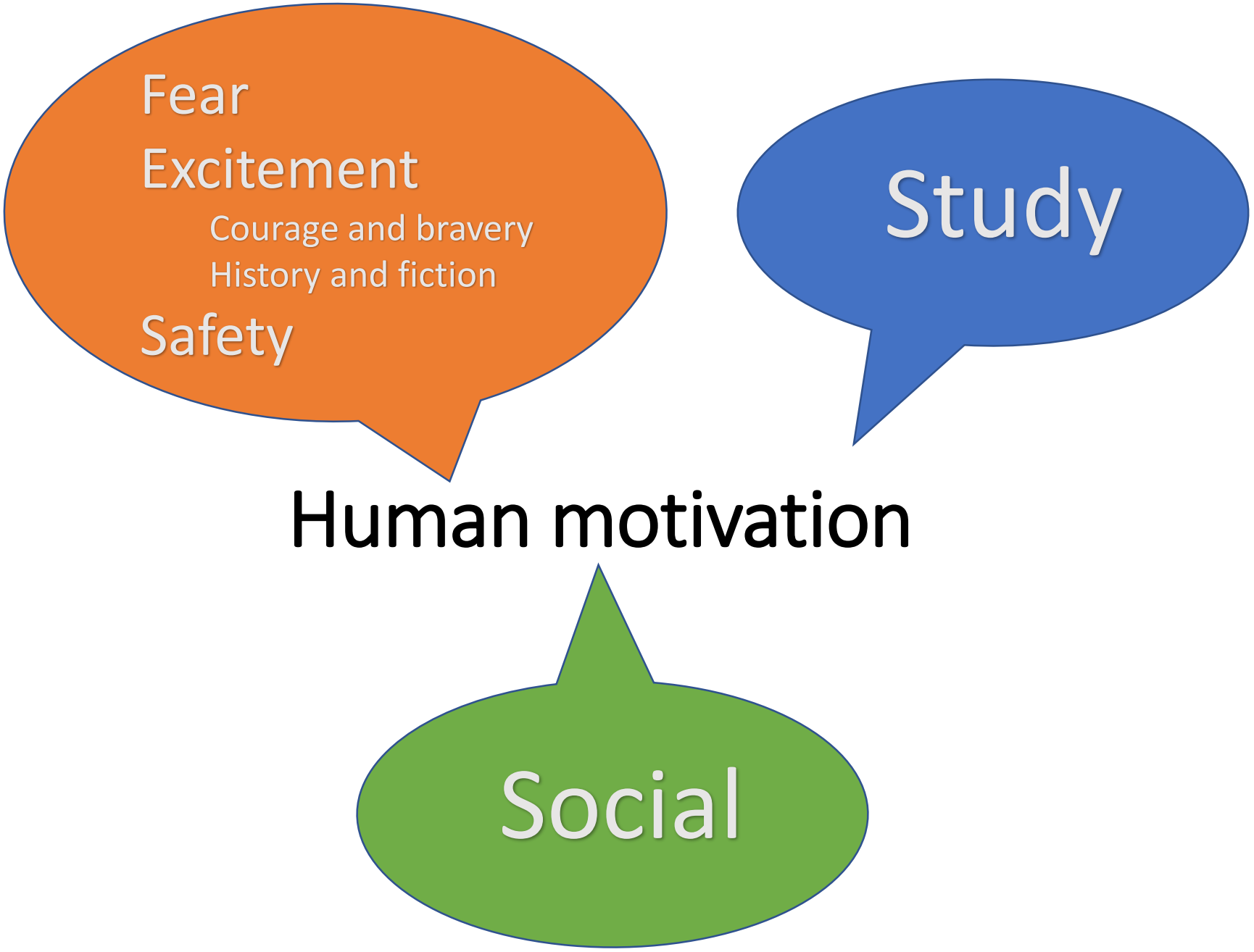
APPLICABILITY OF RADIATION-RESPONSE MODELS TO LOW DOSE PROTECTION STANDARDS

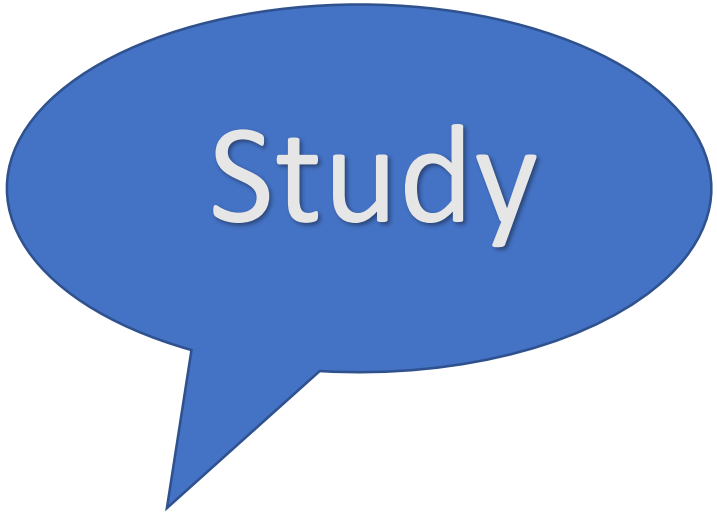
AMERICAN NUCLEAR SOCIETY & HEALTH PHYSICS SOCIETY
JOINT TOPICAL - SEPTEMBER 30 - October 3, 2018
TRI-CITIES, WASHINGTON

SARIans at the 2018 ANS-HPS Convention



Human motivation


Fear
Excitement
Courage and bravery
History and fiction
Safety
Study
Human motivation
Social



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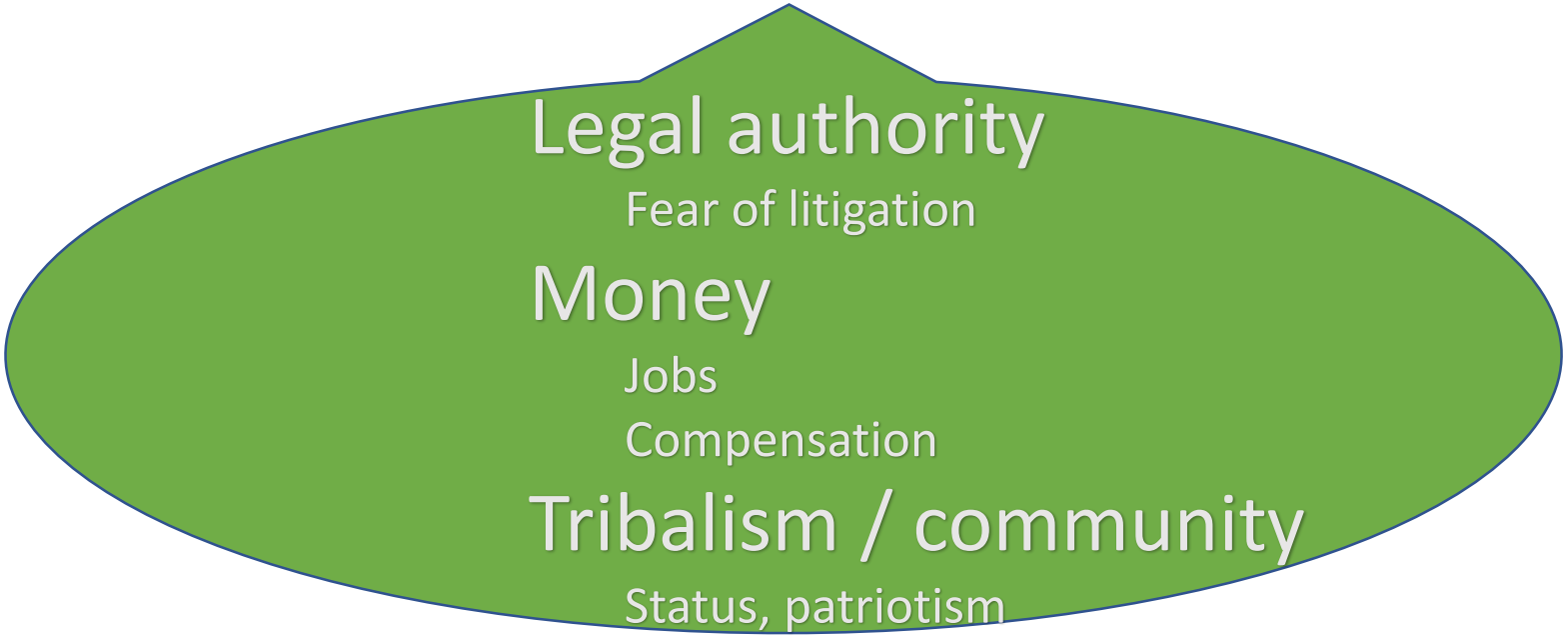
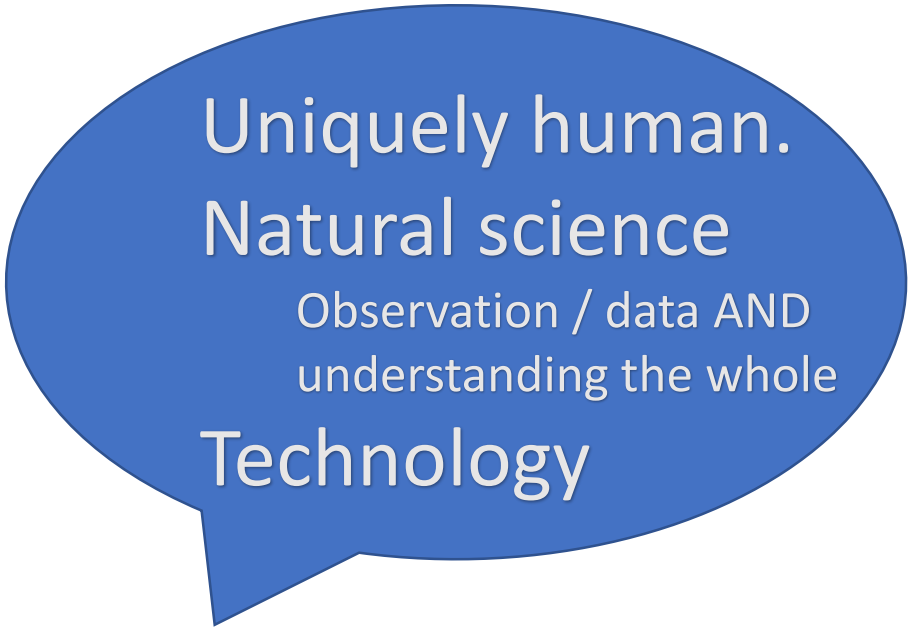
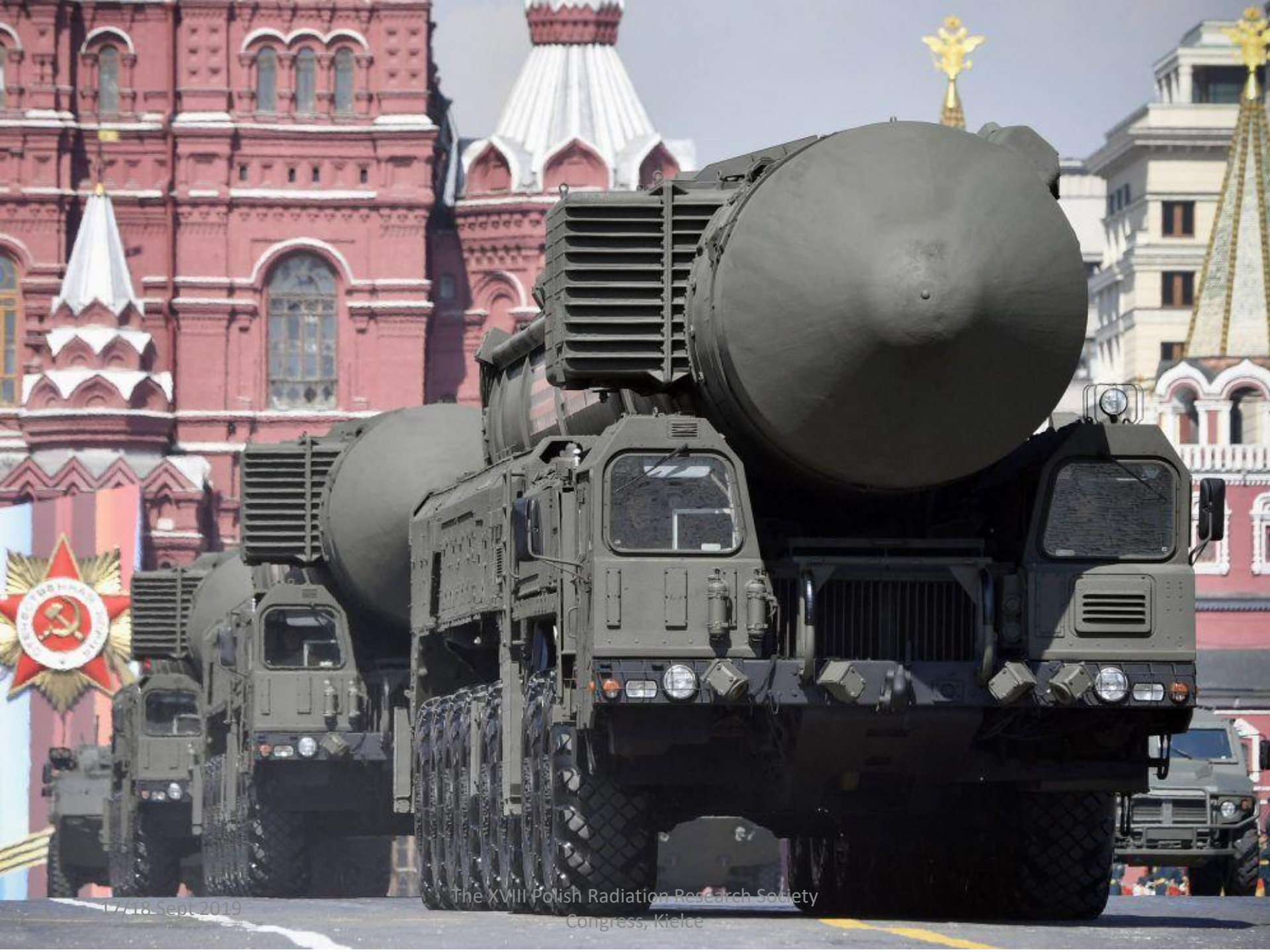


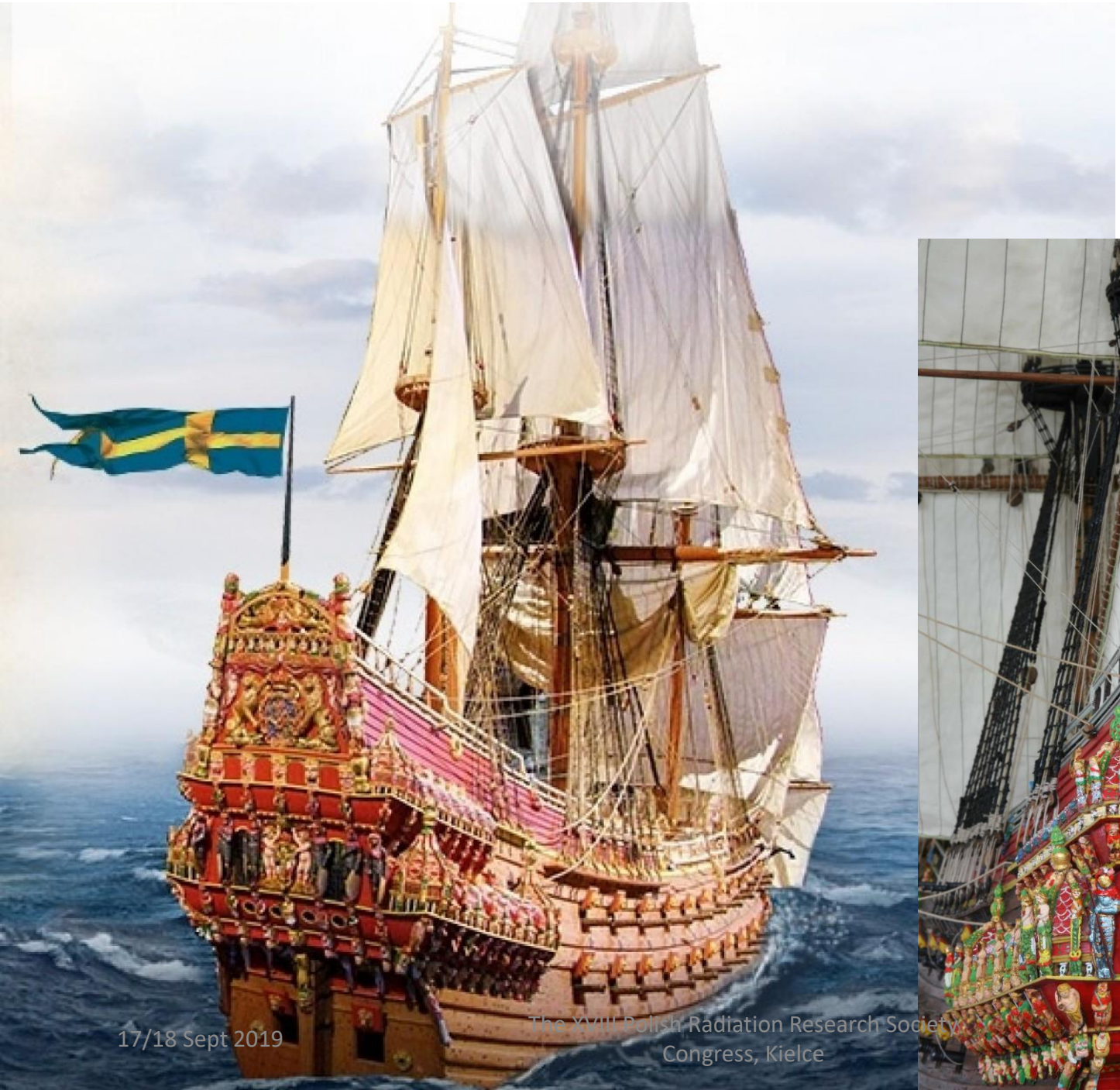


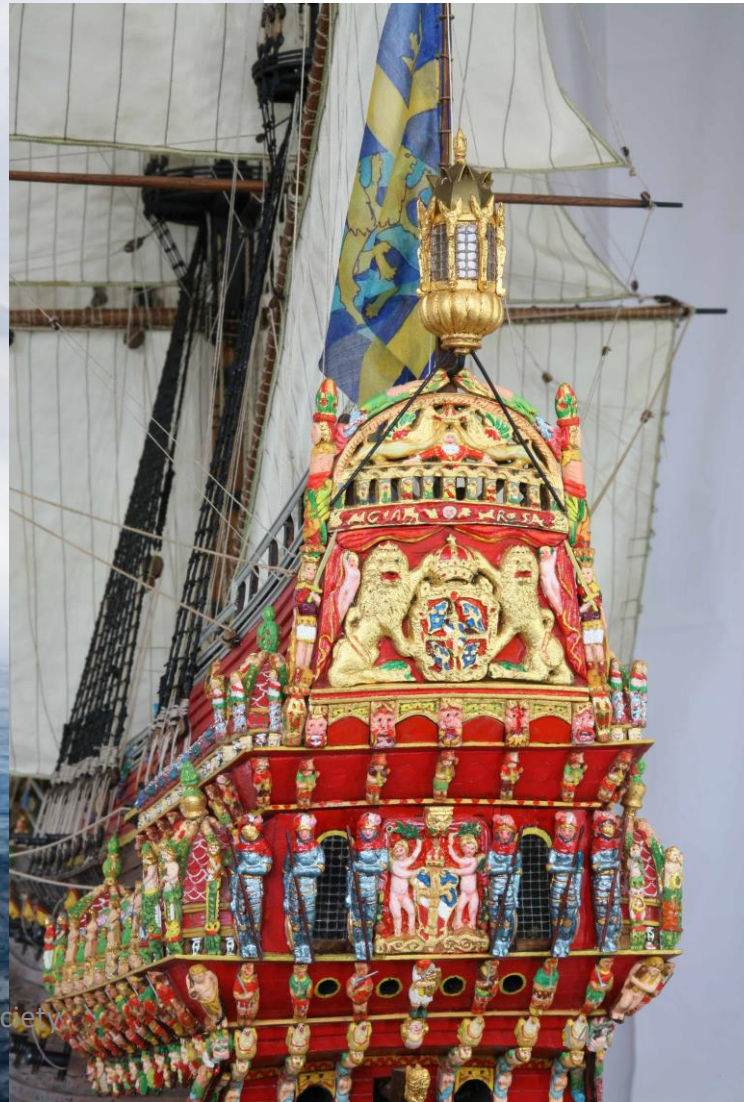
Human motivation

Fear of nuclear has been self sustaining

- Instilling fear is a relatively cheap way to **military success**.
- In the **Cold War** 1945-1989 it worked – universal fear of nuclear.
- For 70 yrs **international authorities** have tried to appease fear.
  But using excessive precaution they have simply increased fear.
  They cling to their jobs and status.
  They neglect scientific evidence and they should be curtailed.
- The **media** thrive on fear and excitement, such as stories like Fukushima – but the radiation there did nothing.
- **Industry** accepts lucrative contracts for pointless safety work.
- The **medical profession** fears regulations and litigation.
- **Public** never hear the truth.
  They are not taught it at school and do not understand
  "Basic nuclear is too difficult for me" – but that is untrue!
  They are told that it is complex and "sophisticated" – it is not!







Battle, fear vs. science, is not resolved by votes or laws

Max Planck: *A new scientific truth[a] does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die.*

Many think they already know and their minds are made up

Tolstoy: *The most difficult subjects can be explained to the most slow witted man if he has not formed any idea of them already; but the simplest thing cannot be made clear to the most intelligent man if he is firmly persuaded that he knows already, without a shadow of doubt, what is laid before him.*

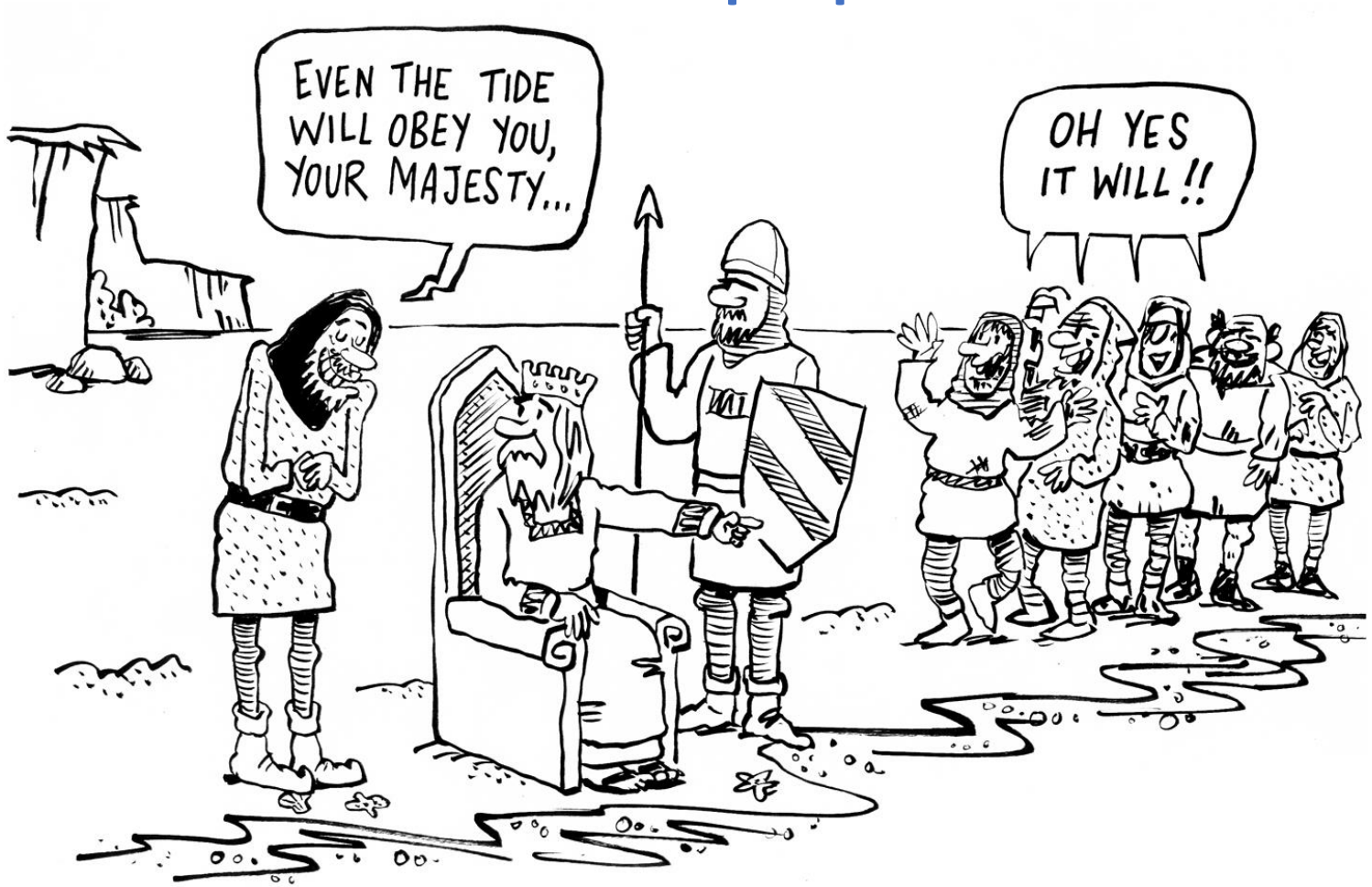
Others are in employment that depends on the status quo

Upton Sinclair: *It is difficult to get a man to understand something when his salary depends on his not understanding it.*

But times are changing!

- We should welcome concern about Climate Change.
- People are asking questions about nature again, not just the safety of their personal employment and skills
- Tight international oversight over ionisation safety regulations is less logical than it would be over sunbathing [Waligorski and more]
- Vested interests in ionisation safety that show no respect for scientific evidence should be disbanded. The regulations for which they have been responsible should be replaced.
- All children should more learn about the natural world, including the dangers and benefits of sunbathing.
- And for chemical and nuclear energy too in the way that they do about fire and crossing the road, and about earthquakes and tsunamis in Japan.
- Familiarity, practice, discussion with advancing age. If they can live to 100, education should never cease or become over-specialised as now.
- They are asking questions in the Arts

We understand the science - we still have to educate the people



As the story of King Canute relates the tide ignored the King's command
Science and the laws of nature are deaf to the authority of governments, to the UN, to any legal decisions, majority votes and the influence of money

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