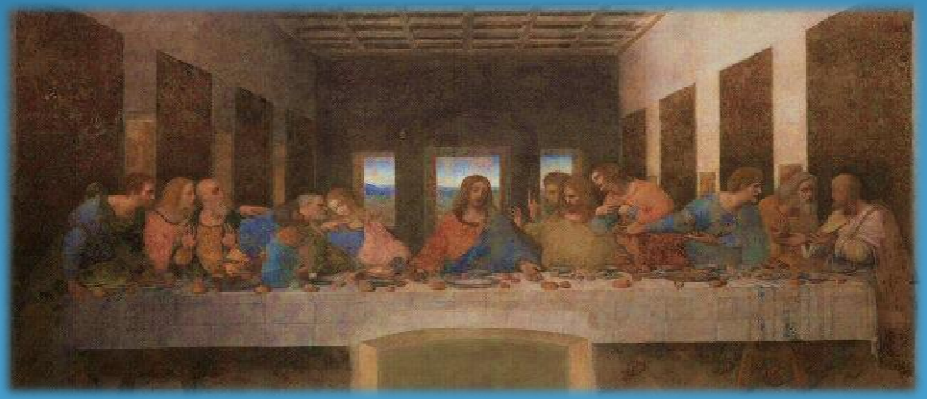
# The Ethics of Radiological Protection: A Focus on Values and Objectives

## 1st European Workshop on the Ethical Dimensions of the Radiological Protection System



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ICRP Scientific Secretary

# Philosophy, Science, and ICRP

ICRP develops and maintains the system of radiological protection based on

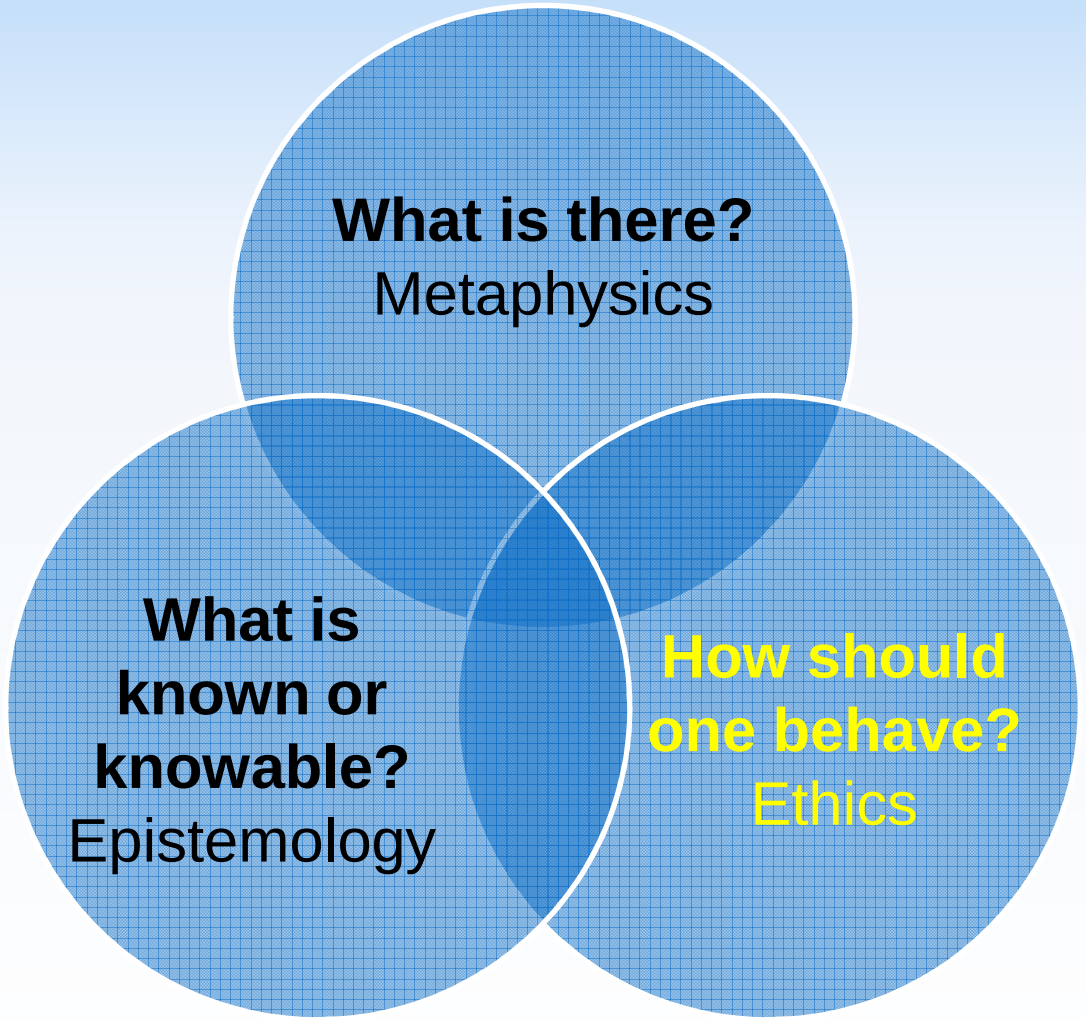
**SCIENCE, VALUES** and **EXPERIENCE**

Scientific and philosophical understanding are fundamental, but as means not ends

ICRP **uses** science and philosophy

# Philosophy

A structured approach to asking and answering questions



# Outline

- Ethics: focus on values
  - Facts vs Values
  - Necessity of value judgments
  - Characteristics of values
  - “Simplifications” for radiological protection

- **Clarifying values** related to the system of protection

- **Clarifying objectives** of the system of protection

***Note: Views in this presentation do not necessarily reflect the views of ICRP***

# Fact and Value

**Fact**

- What **is**
- Questions of science
- Descriptive statements

**Value**

- What **ought to be**
- Ethical questions
- Normative statements

# Fact and Value

**Statements of Fact**

- $^{214}$Bi emits a 609 keV photon upon decay
- Iodine collects principally in the thyroid

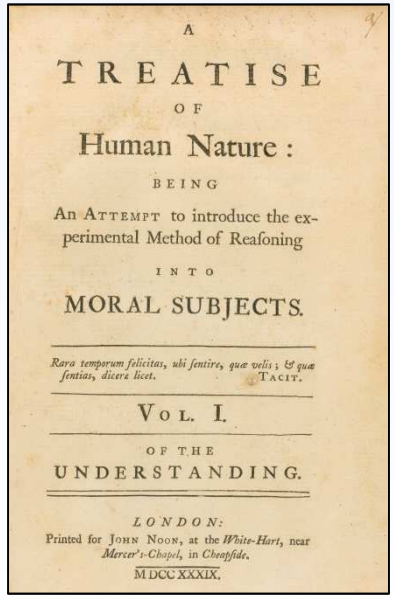
**Statements of Value**

- Children should be protected more than adults
- The environment should be protected

# Hume's Law or Hume's Guillotine

The "is-ought" problem

Described by Scottish philosopher David Hume (1711–76) in "A Treatise of Human Nature" (1739)


A
TREATISE
OF
Human Nature:
BEING
An ATTEMPT to introduce the experimental Method of Reasoning
INTO
MORAL SUBJECTS.
*Rara temporum felicitas, ubi sentire, quæ velis; & quæ sentias, dicere licet.* TACIT.
VOL. I.
OF THE
UNDERSTANDING.
*LONDON:*
Printed for JOHN NOON, at the *White-Hart*, near *Mercer's-Chapel*, in *Cheapside*.
MDCCXXXIX.

It is impossible to derive statements of value (what **ought** to be) from statements of fact (what **is**)

# The Is-Ought Problem

Even complete knowledge is insufficient to decide what ought to be

Knowledge of the effects of radiation is insufficient to develop a system of radiological protection

Science is necessary but insufficient

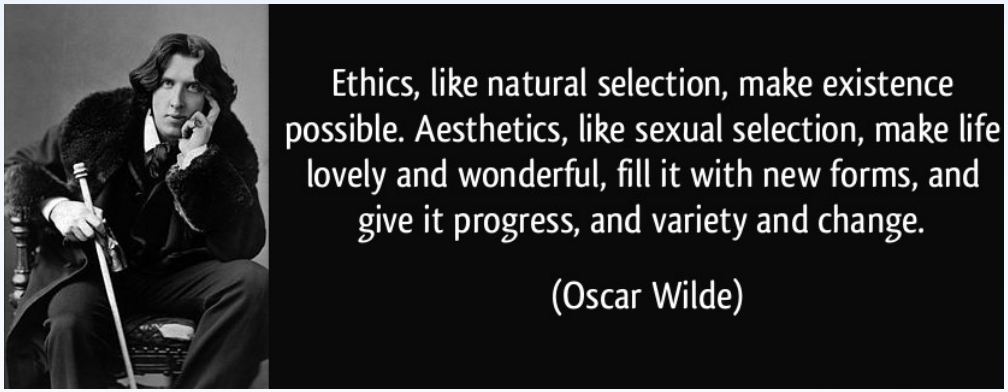
**Value judgments are necessary**

# Value

Axiology is the philosophical study of value and value judgments, including their classification, principally:

**Aesthetics**

- Art, beauty, harmony




**Ethics**

- “Good”, “Right”, and “Virtuous”
- Individual and collective conduct

# Aesthetics

"To create these x-ray artworks serious risks and procedural hurdles need to be managed. The results are worth the hassle. X-ray allows us to see what is normally hidden to the human eye. It reveals the subjects from the inside out and allows us to appreciate what the world around us is truly made of."

"In a nutshell, the work is a statement against society's obsession with superficiality."

**http://nickveasey.com/**

# Ethics and Radiological Protection

- The system of RP is a guide to human conduct, individual and societal, in the domain of radiological protection
- Conduct is about action, so focus on right and wrong action
- Actions can be right
  - Because they produce good (Bentham)
  - Inherently (Kant)
  - Because they arise from virtue (Aristotle)


# Ethics (Moral Philosophy)

*The study of the moral value of human conduct*

***Normative Ethics:*** *Figuring out what is right and wrong behaviour*

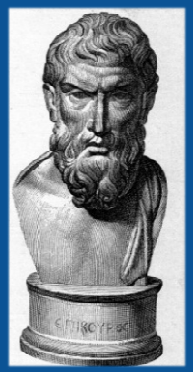
| VIRTUE | DUTY | CONSEQUENCE |
|---|---|---|
| **Virtue Ethics** | **Deontological Ethics** | **Utilitarian Ethics** |
| Focus on habits of character of a person | Actions are judged based on duty or obligation | Actions are judged by their consequences |

# Ethical Theories

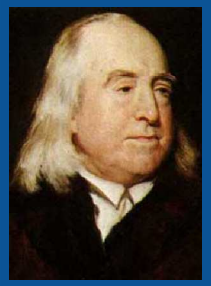

- Kant: actions are inherently right or wrong
- Aristotle: right actions are those that arise from virtuous character
- Bentham: right actions are those that result in good outcomes

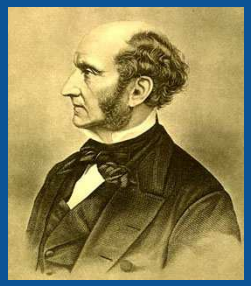
# Utilitarian Ethics

Originates ~300 BC in the work of the Greek philosopher Epicurus



Further developed in 19c England by Jeremy Bentham and John Stuart Mill





## *Actions are judged by their consequences*

- **Consequentialism**: An action is morally right if the consequences of that action are more favourable than unfavourable
- **Utilitarianism**: An action is morally right if the consequences of that action are more favourable than unfavourable to everyone together
- Maximize net benefit to society

"The needs of the many outweigh the needs of the few"

# Deontological Ethics

Immanuel Kant, an 18th century German philosopher, the father of modern deontological ethics

## *Actions are based on duty or obligation*

- Focus on the moral rightness, or intrinsic goodness, of an action
- Actions are right (or wrong), irrespective of the consequences that might follow
- Kant argued there is a single self-evident principle of duty, the “categorical imperative” - act according to rules that you would apply universally

“the needs of the one... outweigh the needs of the many”

# Elegant but Flawed

**Utilitarianism**

Consequence is central

***Ignores justice***

e.g. killing one person for the happiness for millions

***Unknowable consequences***

Calculating total utility (good) is as impossible as predicting the future

**Deontology**

Duty is central

***Duty is not always clear***

It does not always seem rational to ignore the consequences

***Duties cannot all be categorical***

In case of moral dilemma, relative stringency must be considered

# Value Judgements in Radiological Protection

## Utilitarian Ethics

- *Actions are judged by their consequences*

- **Justification**
  - Do more good than harm

- **Optimisation**
  - Maximize good vs. harm

## Deontological Ethics

- *Actions are based on duty or obligation*

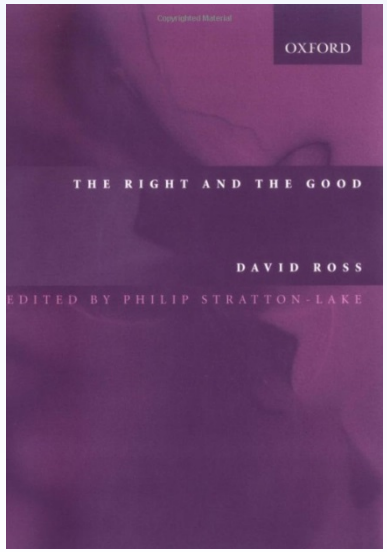
- **Dose Limitation**
  - No individual is unduly harmed

  - Dose Constraints aid optimization & increase equity

# A More “Complex” Alternative

W.D. Ross (1877-1971)
“The Right and the Good” (1930)

- Rejects ideal utilitarianism and Kantian deontology
- Emphasises the complexity of ethical decisions
- Obligations must be **balanced** depending on each circumstance
- Ethical intuitionism



# Ross on Right: Balancing Fundamental Responsibilities (*prima facie* duties)

**Fidelity**
(keeping promises)

**Reparation**
(righting our wrongs)

**Gratitude**
(returning services to those from whom we have accepted benefits)

**Non-maleficence**
(avoidance of the bad)

**Promotion of aggregate good**
(including justice and self-improvement)

# More Broadly: A Matter of Balance

**What is right is a matter of balancing potentially conflicting responsibilities (values)**

# SIMPLIFICATION #1

**Utilitarian, Deontological, and Virtue Ethics**

- Focus less on the differences between classical paradigms, and more on balancing values

# Objective and Subjective Value

**Objective Values**

- Absolute, unchanging, eternal, independent of human thought
- Discovered, not invented
- Plato (428-348 BC) moral realism: truth, good, justice, virtue, beauty


The divided line from Plato's Republic

**Subjective Values**

- Relative to different cultures, subcultures, belief systems
- Constructed by individuals or societies
- Protagoras (c.490 - c.420 BC) "Man is the measure of all things"

*Not mutually exclusive: some may be objective and others subjective*

# SIMPLIFICATION #2

**Objective and Subjective Values**

- Seek values widely accepted internationally today

# Intrinsic and Instrumental Value

Something of **intrinsic value** is worth having for itself, not as a means to something else

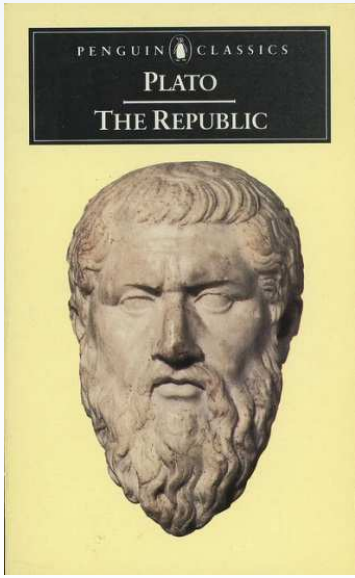
Something of **instrumental value** is worth having as a means towards getting something else good

*Not mutually exclusive*

*e.g. Protection of ecosystems is good because:*

- *Healthy ecosystems are intrinsically valuable*
- *Resources for human use are protected*


Plato (428-348 BC)



# SIMPLIFICATION #3

**Intrinsic and Instrumental Values**

- Don’t worry too much about whether values are instrumental or intrinsic

- Nonetheless, for a deeper understanding seek the intrinsic values which underlie the no less important instrumental values

# Clarifying the Values Related to the System of Radiological Protection

# A Pragmatic Way Forward

**Seek a set of values:**

- Relevant to the system of radiological protection
- Common (or at least acceptable) to the widest possible range of cultures today
  - International recommendations must be broadly applicable
- That stand the test of being applied to current and foreseeable problems, with sensible results

# Clarifying Values
## (Responsibilities/Duties/Obligations)

- Values? Responsibilities? Duties? Obligations?
  - Underlying the system of protection
  - Important in developing the system of protection
  - Important in implementing the system of protection

- Emphasize **BALANCING** potentially competing responsibilities
  - Promotion of aggregate good
  - Non-maleficence
  - Fidelity
  - Gratitude
  - Reparation
  - …

# Many to Consider

- Accountability
- Accuracy
- Adaptability
- Benevolence
- Candor
- Charity
- Clarity
- Compassion
- Competence
- Confidence
- Consistency
- Correctness
- Credibility
- Decisiveness
- Dignity
- Effectiveness
- Efficiency
- Empathy
- Environmental protection
- Fairness
- Fidelity
- Gratitude
- Harmonisation
- Honesty
- Human health
- Individual autonomy
- Individual benefit
- Integrity
- Justice
- Knowledge
- Leadership
- Logic
- Mercy
- Meticulousness
- Modesty
- Non-maleficence
- Open-mindedness
- Partnership
- Paternalism
- Peace
- Practicality
- Pragmatism
- Precaution
- Promise-keeping
- Promotion of aggregate good
- Protection of animals
- Protection of children
- Protection of future generations
- Privacy
- Rationality
- Reasonableness
- Reparation
- Responsibility
- Human rights
- Scientific correctness
- Significance
- Simplicity
- Sincerity
- Social benefit
- Societal autonomy
- Soundness
- Stability
- Timeliness
- Tolerance
- Trustworthiness
- Truth
- Understanding
- Usefulness
- Vision
- Wisdom

# Clarifying the Objectives of the System of Radiological Protection

# Aim of ICRP Recommendations

Contribute to an **appropriate level of protection for people and the environment** against the detrimental effects of radiation exposure without unduly limiting the desirable human actions that may be associated with such exposure

# Objectives of Protection: A Balancing Act

# Objectives

**People**

Prevent deterministic effects (harmful tissue reactions)

Reduce to the extent reasonably achievable risks of stochastic effects (cancer or heritable effects)

**Environment**

Prevent or reduce deleterious radiation effects on biota to have a negligible impact on:

- biological diversity
- conservation of species
- health and status of natural habitats, communities, and ecosystems

# Questions

- Which people?
  - Children, elderly?
  - Men, women?
  - Smokers, non-smokers?
  - Current generation, future generations?
- Absolute prevention = 0% incidence?
- Reducing to the extent reasonably achievable
  - In relation to what? (without unduly limiting the desirable human actions that may be associated with such exposure)
  - What risks are acceptable? Tolerable?

# WHO Definition of Health

**Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.**

- WHO Constitution (entered into force on 1948 April 7)
- The definition has not been amended since 1948

# Objectives of Protection

(for people)

**Promotion of health* in relation to radiation exposures**

*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity

# Clarifying Objectives

- In many circumstances, promotion of health → managing risk of “disease or infirmity”
  - Preventing the preventable (?)
  - Managing risks of the unpreventable

- In some circumstances (e.g. post-accident recovery) this is much more complex

# Clarifying Objectives

## an incomplete list of thoughts (2)

- Promote the health of current and future generations
- Provide a reasonable level of protection for all people:
  - Recognising the special status of children
  - Acceptable for all, but not necessarily equal for all
  - Separate treatment for the very small segment of society suffering from specific and rare medical conditions

# Clarifying Objectives

## an incomplete list of thoughts (2)

- A reasonable level of protection is:
  - for medical exposures of patients, one that optimises the benefit to the patient
  - for occupational exposures, one that ensures risk is no greater than work in other safe industries, and optimised
  - for public exposures, one that keeps exposures well within the range of natural background, and risks well below those of everyday life using prudent assumptions, and optmised

# The Challenge

➢**Clarify values** (responsibilities, duties, obligations ?)

which helps…

➢**Clarify objectives**

in order to…

- better **understand;**
- better **communicate; and,**
- **improve**

the system of radiological protection

www.icrp.org