The Ethics of Radiological Protection: Philosophy, Values, and Practical Challenges

1st Asian Workshop on the Ethical Dimensions of the Radiological Protection System

Daejeon, Korea
2013 August 27-28

Christopher Clement
ICRP Scientific Secretary

Philosophy, Science, and ICRP

ICRP develops and maintains the system of radiological protection based on
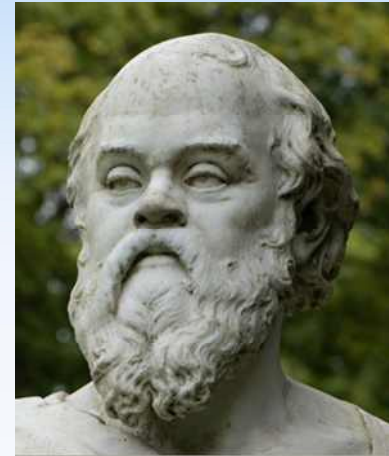**SCIENCE, VALUES** and **EXPERIENCE**

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

ICRP <u>uses</u> science and philosophy

The Ethics of Radiological Protection: Why Worry?

"The unexamined life is not worth living" (Socrates, in Plato's "Apology")

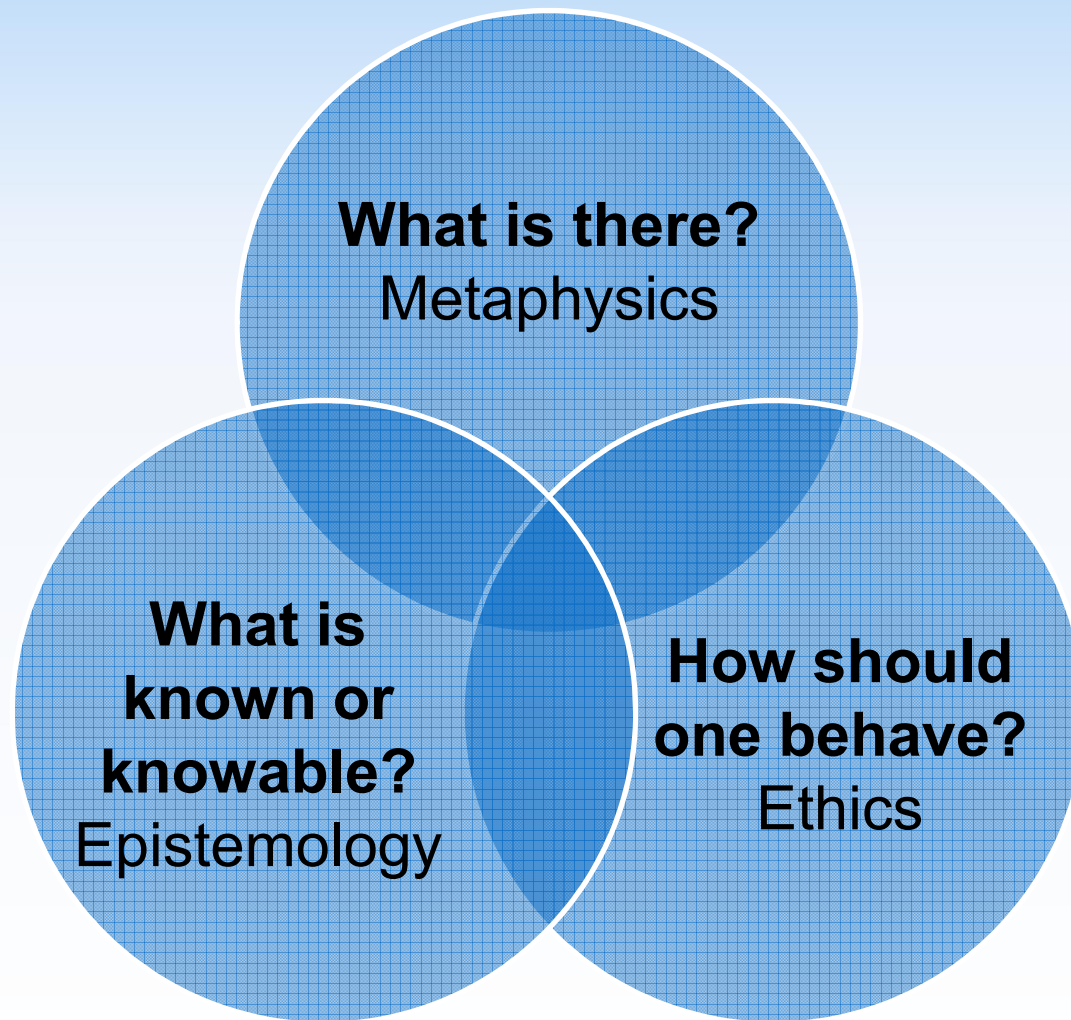Perhaps extreme, but one cannot know if a life is worth living without examining it.

The unexamined system of radiological protection is not worth using

Examining the system of radiological protection we gain a deeper understanding, see if it is serving its intended purpose, and perhaps improve upon it.

Philosophy

A structured approach to asking and answering questions

What is there?
Metaphysics

What is known or knowable?
Epistemology

How should one behave?
Ethics

Philosophical Questions

What is the true nature of existence?

Can anything ever really be known?

Do we have free will?

Are good and right fundamental properties,
or social constructions?

DON'T WORRY
DON'T WORRY
DON'T WORRY
DON'T WORRY

Outline: Focus on VALUE

- Value
  - Why are ethical values important?
  - What makes something good or bad, right or wrong?
  - Characteristics of values

- Examples

- CHALLENGE: A pragmatic way forward

ICRP INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

Fact and Value

Questions and Statements of Fact

- ^{214}Bi emits a 609 keV photon upon decay.
- How does ionising radiation interact with the body?
- Iodine collects principally in the thyroid.

Questions and Statements of Value

- Children should be protected more than adults.
- What is an acceptable lifetime risk?
- The environment should be protected.

Fact and Value

Fact

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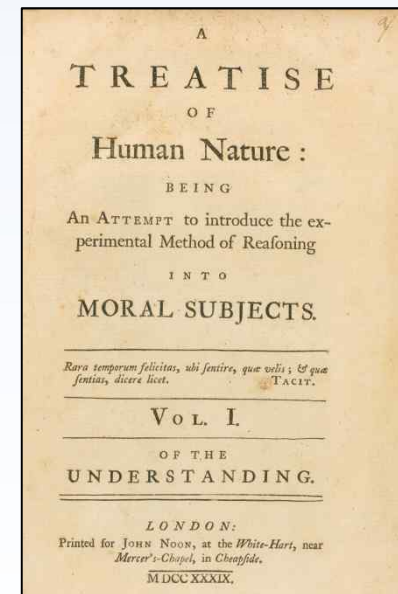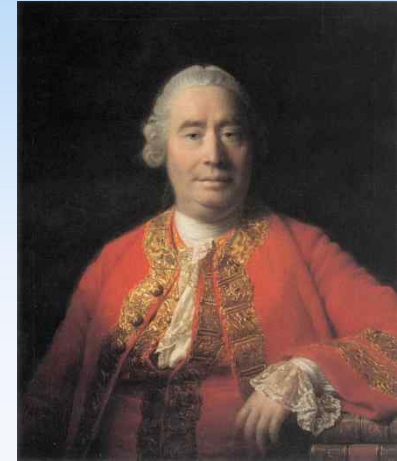
Value

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

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)

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

The Is-Ought Problem

I have been bitten by a poisonous snake.

If I take anti-venom, I will live, if I do not, I will die.

Therefore

I should take anti-venom.

Doses of radiation above 0.5 Gy may result in fatal circulatory disease.

Therefore

People should be protected from receiving doses of radiation above 0.5 Gy.

REQUIRES VALUE JUDGEMENT

REQUIRES VALUE JUDGEMENT

The Is-Ought Problem

Complete knowledge is <u>insufficient</u> to decide what ought to be

Complete knowledge of the effects of radiation is <u>insufficient</u> to develop a system of radiological protection

<u>Value judgments are necessary</u>

INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

Value

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

Aesthetics

- Art, beauty, harmony, taste

Ethics

- "Good" and "Right"
- Individual and collective conduct

Ethics (Moral Philosophy)

The study of the moral value of human conduct

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

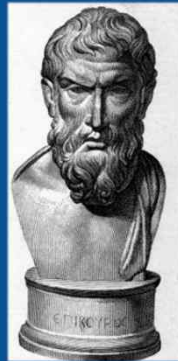| CONSEQUENCE	DUTY	VIRTUE
Utilitarian Ethics	**Deontological Ethics**	**Virtue Ethics**
Actions are judged by their consequences	Actions are judged based on duty or obligation	Focus on habits of character of a person

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
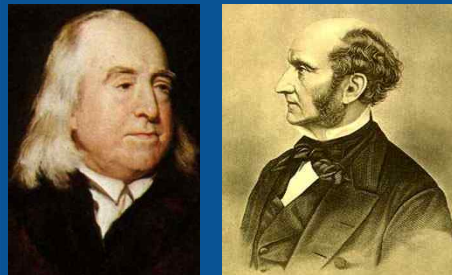
Actions are judged by their consequences

- **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 <u>to everyone together</u>

- Maximize net benefit to society

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

Theory of the Good

CHARACTER		ACTIONS		THINGS
Virtue	←	**Right**	←	**GOOD**

- Some things are <u>fundamentally</u> **GOOD**
- Actions that result in good things are RIGHT
- Traits that bring about right actions are VIRTUES

Deontological Ethics

Immanuel Kant, an 18th century German philosopher, the father of modern deontological ethics
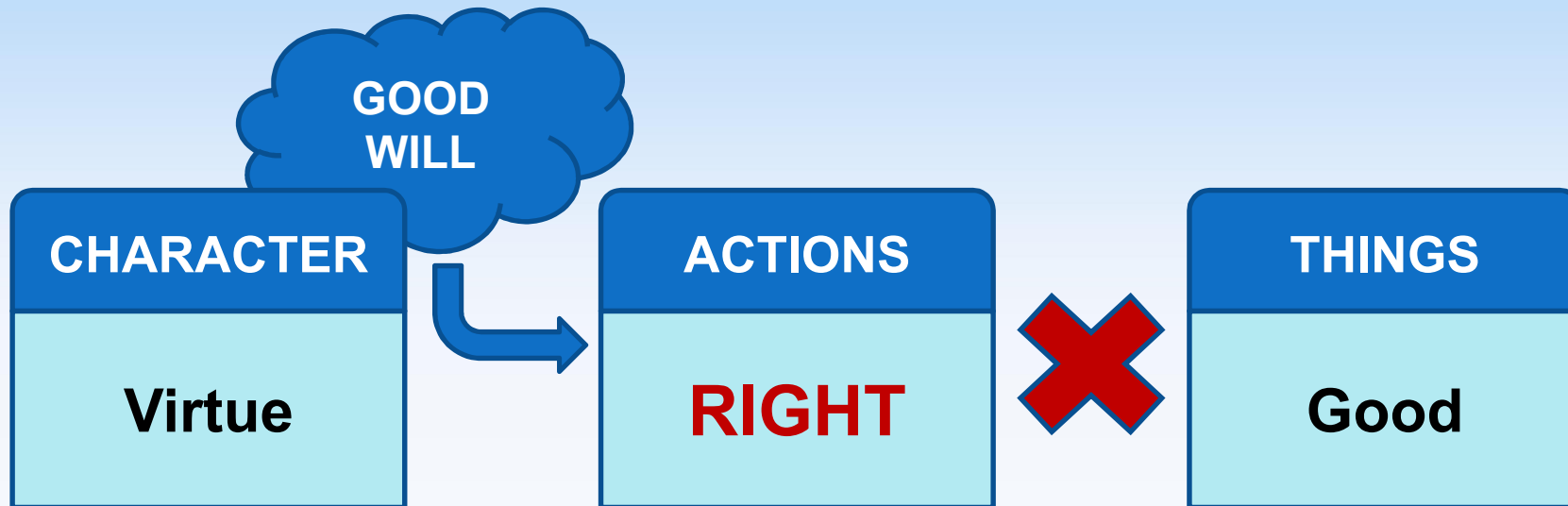
Actions are based on duty or obligation

- 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"

Theory of the Right

```
        ┌─────────┐
        │  GOOD   │
        │  WILL   │
        └────┬────┘
```

CHARACTER	ACTIONS	THINGS
Virtue	**RIGHT**	**Good**

- Some actions are fundamentally **RIGHT**
- The only thing inherently good is the good will
- Consequences of actions are not ethically relevant

Elegant but Flawed

Utilitarianism

Theory of the Good

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

Theory of the Right

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' Ethical Intuitionism

CHARACTER	ACTIONS	THINGS
Virtue	**Right**	**Good**
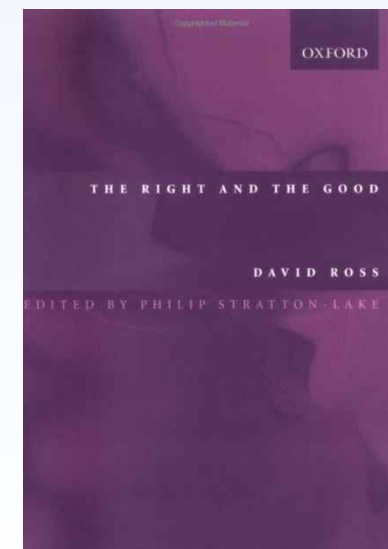
- Right and good depend on a plurality of first principles that may conflict

- Principles are balanced to decide right and good

- We know directly ("intuitively") what is right and good

Ross on Good

Three simple ultimate goods

➢ **Virtue**

➢ **Pleasure**

➢ **Knowledge**

One irreducible complex good

➢ **Justice** - *distribution of happiness in proportion to merit (virtue)*

All other good is derivative

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)
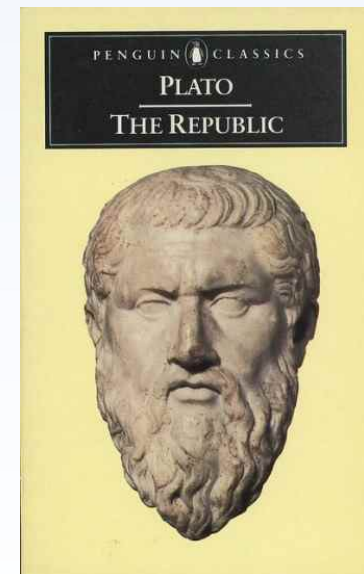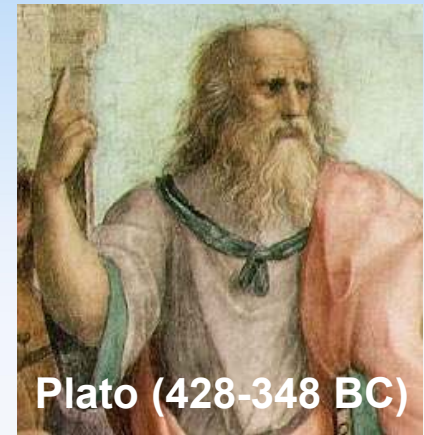
Intrinsic and Instrumental Value

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

Something of **instrumental value** is worth having <u>as a means towards getting something else</u> 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)

A Pragmatic Way Forward (1)

Good and Right: Focus less on the differences between classical paradigms, more on <u>balancing values</u>

Intrinsic vs. Instrumental Values: Understand nature of values, seek intrinsic values which underlie the no less important instrumental values

Objective vs. Subjective Values: Seek values widely accepted internationally today

Transparency: Be clearer about values that shape the system

ICRP INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

A Pragmatic Way Forward (2)

Seek a set of values:

- <u>Relevant</u> to the system of radiological protection

- <u>Common</u> to the widest possible set of people and cultures today
  - International recommendations must be broadly applicable

- That stand the test of being applied to current and foreseeable problems, with sensible results

Values to Consider

- In developing the system of radiological protection
- Underlying the system itself

- 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

Examples of Relevance to Radiological Protection

- Setting dose limits
- Balancing benefit and detriment in optimisation
- Using 'generic' reference values to calculate doses to individuals
  - Adults vs children
  - Smokers vs non-smokers
- Using dose rather than risk as the basis for managing protection

- **EVERYWHERE!**

Risk vs. Dose

For protection of workers, is it right to limit and optimise an approximation of risk (e.g. dose) instead of risk itself?

Some values to consider
- Effectiveness
- Efficiency
- Fairness
- Fidelity to scientific understanding
- Justice
- Non-discrimination
- Protection of human health
- Simplicity
- Usefulness

INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION

Risk vs. Dose

- **Justice** ≈ fairness ≈ non-discrimination (concerning the distribution of risks and benefits)

- **Protection of human health** (intrinsic)
  - Effectiveness (instrumental)
  - Efficiency (instrumental)
  - Simplicity (instrumental)
  - Usefulness (instrumental)

- **Fidelity to scientific understanding**

Risk vs. Dose

Fidelity to scientific understanding

- Risk estimation difficult at low doses / dose rates and for specific individuals
- With uncertainty, other values (precaution?) need consideration

Protection of human health

- Risk of health effects is a fundamental consideration
- Protection must be practical to be useful
- Simplicity and efficiency are aids to practicality
- Difficulties in risk estimation → simpler / more efficient quantity e.g. dose

Justice

- When dose is a 'reasonable' indicator of risk, ensuring a fair distribution of dose ensures a fair distribution of risk - consider were dose is not a 'reasonable' indicator

A Pragmatic Way Forward:
The Challenge

Examine values (responsibilities?) and how they should be balanced

- Consider specific questions of radiological protection
- With people representing a wide variety of cultures and experience
- Include people outside the usual RP community (ethicists, decision makers, citizens)

Document and share results

- Produce annotated set of values describing relevance to the system of protection
- Clearer descriptions in ICRP publications of how values are applied

Continue to evaluate ethical influences on the system of protection

www.icrp.org

ICRP INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION