Finding New Life

How definitions of life shape faith and science

Lucas Mix
22 November 2013
ASA, Cambridge, MA
How do you use the word?
<table>
<thead>
<tr>
<th>Scientific</th>
<th>Popular</th>
<th>Theological</th>
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<tbody>
<tr>
<td>alien life</td>
<td>Stayin’ Alive</td>
<td>eternal life</td>
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<tr>
<td>life in space</td>
<td>look alive</td>
<td>bread of life</td>
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<td>origin of life</td>
<td>Life of the party</td>
<td>breath</td>
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<td>life and death</td>
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How do you use the word?
Pornography Definition

Justice Potter Stewart

“I know it when I see it.”

Jacobellis v. Ohio, 378 US 184 (1964), Justice Stewart concurring
Pornography Definition

Justice William Brennan

“none of the available formulas... can reduce the vagueness to a tolerable level.”

Inconvenient facts (science)
Value (theology)

Paris Adult Theatre I v. Slaton, 413 US 49 (1973), Justice Brennan dissenting
Justice William Brennan

“none of the available formulas... can reduce the vagueness to a tolerable level.”

Inconvenient facts (science)

Value (theology)

[And vice versa?]

Pornography Definition

Paris Adult Theatre I v. Slaton, 413 US 49 (1973), Justice Brennan dissenting
Biblical Definitions

Genesis

- Ruach רוח
- wind, breath of life, spirit, Spirit

1:2 Wind upon the deep 6:17 breath of life, Noah Num. 5:14 jealousy
Genesis

- Nephesh נפש
- That which has breath, soul

Biblical Definitions

2:7 humans, 1:20, 2:19 animals
Gospels

- Pneuma
- wind, breath of life, spirit, Spirit

Biblical Definitions

Jn 3:6 Flesh is born of flesh, spirit of spirit, Jn 4:24 God is spirit, Mt 5:3 poor in spirit
Biblical Definitions

☞ Gospels
☞ Psyche ψυχή
☞ that which has breath, soul

Mt 16:25-26 what profit... Lk 1:46-47 my soul doth...
Give up the Ghost

- ἐξέπνευσεν
- Breathed his last, commended his spirit
- Contrast Acts 5 and 23 ἐξέψυξεν

Zoe

- ζωή
- Mt. 4:4: But he answered, ‘It is written, “One does not live by bread alone, but by every word that comes from the mouth of God.”’
- Contrast Deuteronomy 8:3

Biblical Definitions
Aristotle’s Definition

De Anima (On the Soul)
- ψυχή, ενεργεία
- nutritive soul – plants
- motive/sensitive soul – animals
- rational soul – humans

Hylomorphic compounds
Aquinas’ Definition

**Summa Theologiae**

- *anima*
- rational soul – intelligence – Plato
- sensitive soul – senses – Aristotle
- Separable and created separately
Aquinas’ Definition
Aquinas’ Definition
Aquinas' Definition
Particles and Forces
- Lucretius
- Gassendi and Descartes
Mechanical Definition

Awkward Patch: Unmoved Mover, Mind/Soul
Hierarchical Comparison

Bible / Breath

God

Salvation (Xn)
Reason (human)
Motion (animal)

Existence
Hierarchical Comparison

Bible / Breath
- God
- Salvation (Xn)
- Reason (human)
- Motion (animal)
- Existence
Hierarchical Comparison

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Biology: Can we do without the patch? Theology: Can we do without the line? Value?
Mechanical Biology?
- particles and forces
- Hard questions
- purpose versus function
- (telos, proper end, goal, activity)
- value?

Mechanical Definition
Evolution

- systems capable of adaptation
- chemical?
- detection?

Mechanical Definition

Mechanical Definition

Evolution
- systems capable of adaptation
- chemical?
- detection?

“Fitness of the adaptive”
Mechanical Definition

Evolution

- systems capable of adaptation
- chemical?
- detection?

Purpose Redux
Mechanical Definitions

Maintenance
- Locally anti-entropic
- metabolism
- detection?

Schroedinger 1944
Mechanical Definitions

- Maintenance
  - Locally anti-entropic (systems capable of avoiding decay?)
  - metabolism
  - detection?

Schrodinger 1944
Mechanical Definitions

- Maintenance
  - Locally anti-entropic
  - metabolism
  - detection?

Schrodinger 1944
Mechanical Definitions

- Chemical
  - CHNOPS
  - Miller/Urey

- Biochemical
  - Nucleic Acids
  - Polypeptides
  - Carbohydrates
  - Sugars

Viking Labeled Release
Mechanical Definitions

**Chemical**
- CHNOPS
- Miller/Urey

**Information**
- complexity/order
- semantics v. thermodynamics
- Walker Davies 2013

**Biochemical**
- Nucleic Acids
- Polypeptides
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**Mechanical Definitions**
Mechanical Definitions

Chemical
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- Miller/Urey

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Forms
Teilhard de Chardin
Haught
Mechanical Definitions

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- **Vital Force**
  - Bergeson 1907
  - Teilhard 1955
  - causal closure?
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  - Walker Davies 2013

- **Maintenance**
  - Locally anti-entropic
  - Oparin 1924
  - Haldane 1929
  - Schrodinger 1944
### Mechanical Definitions

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<tr>
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<th>Information</th>
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<td>Troland 1917</td>
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<tr>
<td>+ Value</td>
<td>- Value</td>
<td>++ Value</td>
<td>- Value</td>
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<tr>
<td>+ Exceptionalism</td>
<td>- Exceptionalism</td>
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<tr>
<td>+ Science</td>
<td>+ Science</td>
<td>? Science</td>
<td>++ Science</td>
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<tr>
<td>- Dualism</td>
<td>- (Form?)</td>
<td>- Life/Non-life</td>
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- Value: Positive
- Exceptionalism: Negative
- Science: Mixed
- Life/Non-life: Mixed
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- **Bible/Breath**
  - ++ Value
  - - Exceptionalism
  - ? Science

- **Aquinas/Soul**
  - + Value
  - + Exceptionalism
  - + Science
  - - Dualism

- **Aristotle/Activity**
  - - Value
  - - Exceptionalism
  - + Science
  - - (Form?)

- **Mechanical**
  - - Value
  - - Exceptionalism
  - + Science
  - ++ Science
  - - Life/Non-life

- **Adaptation**
  - Does value = success?
  - Is evolution progress?
  - Is competition evil?

- **Maintenance**
  - Is life futile?
    - (Dualism)
  - Are there individuals?

Hidden
(unavoidable?)
value questions
Thank you!

This work was made possible through the support of a grant from the John Templeton Foundation. The opinions expressed in this work are those of the author and do not necessarily reflect the views of the John Templeton Foundation.

David Haig and the Department of Organismic and Evolutionary Biology at Harvard.

Thea Keith-Lucas and the Lutheran Episcopal Ministry at MIT

For more information:

http://sciencespiritscripture.wordpress.com/

http://dacalu.wordpress.com

lmix@fas.harvard.edu

Science and Religion Reading Group @ MIT