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Can Theology Keep up with Science?

# Can Theology Keep up with Science?

- Theology constantly challenged by scientific advances
- How should theology adapt to this?
- What kind of theology would result?
  - We need rules to guide the dialogue
  - We need a sound creation theology as a basis
  - We need to be adventurous

# Creation stories

- All ancient civilizations and current primitive peoples have creation stories
- Bible has two: Gen.2 (900 BC) and Gen.1 (500 BC)
- Common element: primordial chaos (differently described) from which divinity creates
- Gen.2: lifeless desert; Gen.1 formless void, waters, darkness (elements from Babylonian *Enuma Elish*)
- Yet, common Christian creation doctrine is *creatio ex nihilo* (creation from nothing). Why?

## *Creatio ex nihilo*

- In 2nd c. Christian belief threatened by gnosticism
- Gnosticism: evil demiurge creating from pre-existing evil matter. Good God (Father of JC) would put it right.  
Dualism, two gods
- Theophilus of Antioch (c. 180), in his battle against gnosticism, invented *creatio ex nihilo* (creation from nothing)
- Rapidly (and uncritically) accepted and held till now
- But it has five major problems

## Problems with *creatio ex nihilo*

- Conceptual: we cannot visualize nihil --> ‘existing’ nihil  
e.g., Karl Barth, *das Nichtige* (chaos and evil)
- Scientific: science does not know nihil
- Biblical: no reference to nihil
- Theological: no satisfactory formulation of creation from nothing (e.g., Jürgen Moltmann)
- Theodicy: evil then created by God (Satan no solution: if under God’s control, then God still responsible; if not, then dualism)

# Defense of *creatio ex nihilo*, 1

- Job 26:7 (*He stretches out the north over the void, and hangs the earth upon nothing*)
- Rom.4:17 (*God who calls into existence the things that do not exist*)
- Heb.11:3 (*... what is seen was made out of things which do not appear*)
- 2 Macc.7:28 (*God did not make them out of things that existed*)

All four fit equally well with creation from chaos (not a bunch of lego blocks)

Nihil is not a biblical concept

## Defense of *creatio ex nihilo*, 2

‘Explaining’ the problem of evil (*theodicy*):

- ‘*Original sin*’ may explain existence of sin, but not ‘why’
- *Free will* may explain possibility, but not ‘why’
- Augustine’s evil as *absence of good* too soft (holocaust)
- Irenaeus’ *evil within God’s good purpose* compromises God’s omnipotence
- ‘*Soul making*’ (evil meant to make us grow through suffering): compromises God’s goodness

“*Theodicy attempts to justify the unjustifiable*” (Fergusson)

## Defense of *creatio ex nihilo*, 3

Fall back positions:

- *It emphasizes God's omnipotence*

but creation from utter chaos is equally impressive

- *It is a philosophical statement* (e.g., Hans Küng)

but a philosophical statement without biblical or scientific evidence is meaningless

# Initial mystery

- Cosmology **assumes** explosion at  $t=0$  from development of expanding cosmos. Cannot come closer than  $t=10^{-43}$  sec (Planck time).
- Attempt to integrate gravity into quantum theory by means of string theory unsuccessful, no testable data
- Stephen Hawking has abandoned his earlier optimism about possibility of a 'Theory of Everything'
- Biblical creation stories pose an initial chaos but offer no definition
- We may have to accept initial mystery about cosmic origin

# Chaos Theology, 1

I replace *creatio ex nihilo* with creation from chaos

## 1. Initial creation from primordial chaos

biblical: Gen.1 and Gen.2

science: at  $t = 0$  vacuum with quantum fluctuations

## 2. Continuing creation

biblical: Gen.1-11 (incl. flood) full creation story

Mk.13:19 ...*God created until now*

science: cosmic and biological evolution

# Chaos Theology, 2

## 3. Remaining chaos

- In OT symbolized as 'sea'(22x); NT 8x
- God battles remaining chaos
- Rev.21:1 *sea was no more*: chaos abolished

## 4. Evil emanates from remaining chaos

- physical evil: earthquakes, hurricanes, disease, all chaotic
- moral evil: chaotic thinking

Nos. 1-3 biblical, no. 4 my invention

# Evil in chaos theology

- Evil emanates from remaining chaos, abolished on last day (Rev.21:1 - *the sea was no more*)
- Not created by God or demiurge, nor inherited from Adam
- Physical evil: chaotic tectonic forces cause earthquakes and eruptions, chaotic atmosphere causes hurricanes, random mutations cause disease.
- Moral evil: due to chaotic thinking. Paul: *I do not understand my own actions. For I do not do what I want, but I do the very thing I hate* (Rom.7:15). Temptation

# Usefulness of Chaos Theology

- *Creatio ex nihilo* not used in further doctrinal development (Christology, Spirit, salvation, eschatology); unsuitable for dialogue with science
- Chaos theology
  - has none of the five problems of *creatio ex nihilo*;
  - is suitable for dialogue as science knows initial chaos
  - can shed new light on God's action in the world, work of Spirit and Christ, salvation, evil in the world, eschatology

# God's action in initial creation, 1

- Gen.1 has the *Logos* as God's creative agent. Philo (d. 50) and Maximus Confessor (d. 662): *Logos* as God's *energeia*
  - *Logos* brought in energy for 'big bang' ( $> 10^{22}$  kWh), part for kinetic energy of explosion and expansion, part for later conversion to particles
  - Needed to order chaotic explosion: physical laws and fundamental constants, *Spirit* as information carrier
- [In Gen.1:2 *ruach* not Spirit, but *mighty wind*, part of chaos, not creative agent]

## God's action in initial creation, 2

- Quantumcosmology: 1 bit/square Planck distance ( $10^{-35}$  m)
- After  $t = 0$ , but before 'inflation' (brief exponential expansion) started at  $t = 10^{-35}$  sec
- Calculation shows then 10 gigabits possible (10.000 bks), plenty for physical laws and fundamental constants
- Conclusion: *Logos* and *Spirit* are God's 'creative hands' (Irenaeus, c. 180)
- Trinitarian creation theology (Father as creator)

# God's action in continuing creation

- God leaves evolving cosmos and life much freedom as 'trial and error' process, intervenes only at crises
- How? Changing physical laws or fundamental constants would be catastrophic
- Through quantum events or self-organization - unlikely
- Through influencing chaos events described by chaos theory - more likely

Note: in chaos events chaos means *unpredictable*;

in chaos theology chaos means *disorder*

# Chaos theory: chaos events, 1

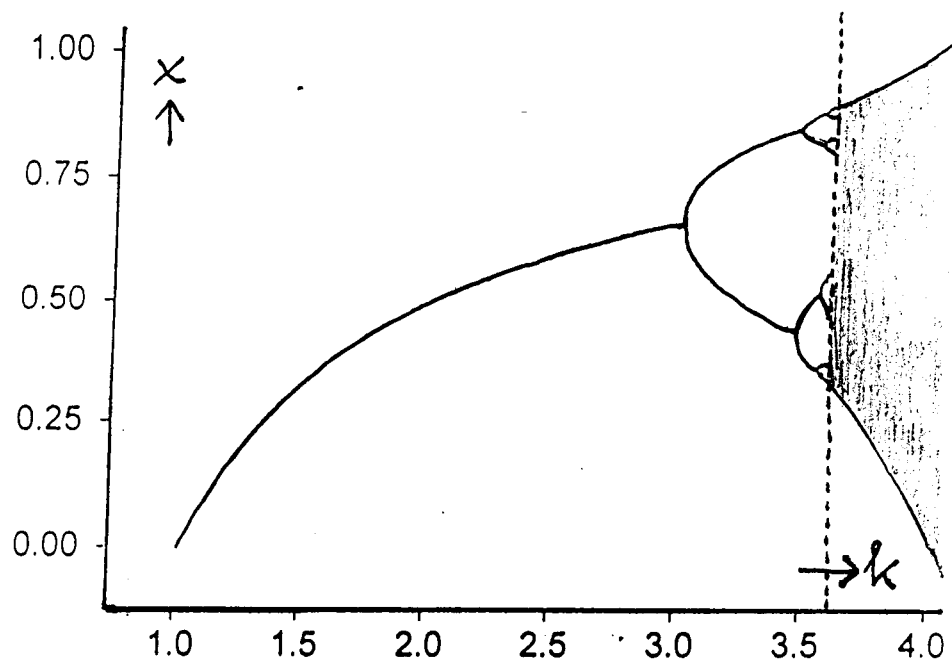
- Biological organisms, solar system, climate etc. obey non-linear dynamics in time, given by equation:

$$x_{n+1} = k \cdot x_n (1 - x_n)$$

- Example: reproduction of moth colony  
 $x_n$  is number of moths in generation  $n$ ,  $x_{n+1}$  in next  
( $1 - x_n$ ) for starvation or disease in very dense colony  
 $k$  represents fertility, slowly increasing
- Requires computer calculation

# Chaos theory: chaos events, 2

Fork at  $k = 3.0$ , two at  $k = 3.45$ , infinite at  $k = 3.57$



## Chaos theory: chaos events, 3

- No energy difference between legs, so equally likely
- System becomes unpredictable (chaotic)
- Influencing possible by 1 bit of information
  
- Observed in laboratory experiments:
  1. turbulent flow of He-3 by lowering temp. from 0.0010 to 0.0007 °K
  2. electron diffusion in semiconductor by adjusting voltage (merely forcing into chaotic behavior)

# Chaos theory: chaos events, 4

- Can God influence a chaos event?

$$\Delta E = \Delta I \times k_B \times T \times \ln 2 \quad \Delta E \times \Delta t = h$$

- Calculation:

$$\Delta E = 0.7 \times 10^{-21} \text{ gcal}, \Delta T = 10^{-14} \text{ }^\circ\text{C}$$

$$\Delta t = 2.0 \times 10^{-13} \text{ sec}$$

- Conclusion: it is possible, but will be undetectable for us (too small, too fast, moment not known)

# God's action in creation summary

## Initial creation

- *Logos* provided energy: kinetic energy of explosion, energy for later conversion to particles
- *Spirit* ordered chaotic explosion: physical laws, fundamental constants. At  $10^{-35}$  sec 10 gigabits possible
- *Logos* and *Spirit* are God's 'creative hands' (Irenaeus)

## Continuing creation

- Cosmic and biological evolution trial and error process  
In crisis God intervenes by influencing chaos event

# God's action in creation objections answered

Objections to application of science

1. *Interventionism*: deism, deterministic course to final goal  
Chaos theory with chaos events shows this cannot be
2. *No First Cause*: where God takes initiative, God is First Cause for the ensuing events
3. *Science cannot speak about the transcendent*: actions in our world are immanent and assumed to proceed according to physical laws laid down by God in the beginning

# Spirit and Information

- Information for creation at beginning and at end
- Life-giving to first living cells and throughout evolution, as well as to each of us individually
- Representing God to us after Christ's ascension
- Revealing God's message in prophecy and preaching
- Unifying and sanctifying the Church
- Transmitting our prayers to God
- Spirit is a crucial and very active member of the Trinity, provides God's permanent immanence in creation

# Spirit and Information 'mechanism'

How does Spirit transmit information?

Pannenberg: Spirit acts as divine field of force (Faraday)

(depersonalizes Sp.; not physical reality but metaphor)

Loder&Neidhard: Strange Loop model, based on *perichoresis*  
idea of Gregory of Naz. (no insight in action of Sp.)

Moltmann: gives Sp. near-monopoly in creation, but refers  
only to life-giving action of Sp. (neglecting 9 billion yrs of  
creation before life originated)

# Spirit and Information

## my metaphor, 1

Spirit acts like cosmic Internet: virtually instantaneous, world-wide transmission of information (text, numerical data, images, voice) in digital form

Life-giving action: like remote activation of apparatus

Unifier: like message posted on Internet leading to concerted action of many people

Prayer: like e-mail message transmitted to addressee anywhere in the world

# Spirit and Information

## my metaphor, 2

Receptivity to Spirit: for wireless connection to Internet  
‘airport card’ in computer must be tuned to phone or cable  
modem to receive and send messages.

Evil spirits assumed in some of Jesus’ healing acts can be  
compared to ‘spam’ entering our computer.

Interaction of spiritual ‘information’ with our mind: triggers  
nerve impulses in neuronal networks in specific areas of  
the brain. Meditation: frontal cortex to limbic system,  
parietal lobe deactivated. Serotonin affects spirituality

# Cosmic Christ and reconciliation, 1

- Traditional focus on human reconciliation is wrong
- Paul (2Cor.5:19) and John (Jn.3:17): Christ is reconciling the world (Gk. *kosmos*) to God, not just us
- Supported by cosmology: “*we are made of stardust*”  
Early stars produced from H all elements, in supernova explosion ejected into space as cosmic dust, later accreted to form Sun and Earth, all living beings formed from these elements through food chain. Thus humans, incl. Jesus of Nazareth, in union with entire cosmos
- Hence: Jesus’ saving work comprises entire cosmos

## Cosmic Christ and reconciliation, 2

- Through the incarnation Jesus becomes the cosmic Christ
- God battles remaining chaos for 13.7 billion yrs already
- Is a cosmic drama, not only a human predicament
- But sinfulness of those created in God's image is serious, has even led to the crucifixion
- Jesus died *through*, rather than *for* our sins; reconciliation through *resurrection* rather than through *crucifixion*
- Humans are the only creatures that have to say Yes or No to share in Christ's cosmic reconciliation (cf. NDE panoramic judgmental review)

# Eschatology, 1

- Sharp conflict between science and theology accounts
- Cosmology: in 24 billion yrs complete degradation, in final b.y. galaxies and solar systems break up, in final 30 min stars and planets disintegrate, in final sec molecules and atoms break up and evaporate to cold photon cloud
- In 5 b.y. Sun turns into red giant, touching Earth, 1300 °C, all earthly life ends
- Steven Weinberg: "*The more I understand the universe, the more it seems to me to be pointless.*"

# Eschatology, 2

- Biblical account is hopeful: chaos abolished, new heaven and earth, eternity life after our resurrection
- Before last day catastrophes, drought, starvation, disease, warfare (ecological crisis, conflicts about oil?), but not even the apocalyptic stories predict complete degradation of cosmos.
- When last day?: before irreversible harm has occurred
- Why conflict with cosmological prediction? *closed* (no energy and information coming in) vs. *open* universe

# Eschatology, 3

- Biblical view assumes open universe, open to God
- Christ, the incarnate *Logos*, will provide the energy, Spirit the ‘physical laws’ needed for the new creation [now no delay because present universe is large]
- Not evolutionary, but revolutionary transformation
- Not through our work, but through God’s work
- We may erect signs through fighting ecological crisis, armed conflicts, injustice
- We need only say Yes to be part of this new world

# Conclusions

Chaos theology shown to be useful in understanding:

- God's action in creation, initial and continuing
- Work of the Spirit
- The presence of evil
- Cosmic Christ brings cosmic reconciliation
- Eschatology: conflict with scientific predictions resolved

Yes, theology can keep up with science, if they engage in dialogue

## Further reading

*Creation and Double Chaos*

Fortress Press, Minneapolis, 2005

website:

[www.chaostheologie.nl](http://www.chaostheologie.nl)