

Can a scientist with tools of his science distinguish between chance and purpose or design?

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Can a scientist with tools of his science distinguish between chance and purpose or design?

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What is physics?

The science of physics has developed out of the efforts of men and women to explain our physical environment. The exciting feature of physics is its capacity for predicting how nature will behave in one situation on the basis of experimental data obtained in other situation.

Cutnell and Johnson, Physics, 7th edition, John Wiley, 2007

- deals with physical environment, i.e. a restricted part of reality
- predicts how nature will behave

A Gedanken experiment by John Bell^{*)}

Tossing of coins

possible outcome: either heads “H” or tails “ “

example:

first tossing: head H
second: tail H
third: head H H
fourth head H HH
after some time: H HHHH HH H HH

simulations by computer:

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H HHH HH H H HHHH H H HH H H H H HHH H HHH
HHH H HHHH HHH H H HH H HHHH HH H H H H H HH HHH
HH H H H HH HH H HHHH HH HH HH HH H HH H HH H H H HHH
H H HH H H H H HHHH HH H HH HHHH HHHH H H H H HHH H
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HHHH H HH H HHH HHHH HHH H H HH H H H HHH HHH HHH H
H HHH HH H HH H H HHH HH H H HH H H HHH H H HH H
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^{*)} John S. Bell, in *Mathematical Undecidability, Quantum Nonlocality and the Question of the Existence of God*, A. Driessen and A. Suarez, eds., Kluwer Academic Publishers, 1997.

A Gedanken experiment by John Bell

Tossing of coins

Suppose magic power to turn after tossing certain coins once more, i.e. random character of outcome remains, but a previous head becomes tail and vice versa

result:

before 'magic'

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H HHH HH H H HHHH H H HH H H H H HHH H HHH
HHH H HHHH HHH H H HH H HHHH HH H H H H H H HH HHH
HH H H H HH HH H HHHH HH HH HH HH H HH H HH H H H HHH
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H HHHH H H H HHHH HHH H HH HH H H H HHHH H H HHH HH
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after 'magic'

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H HHH HH H H HHHH H H HH H H H H HHH H HHH
HHH H HHHH HHH H H HH H HHHH HH H H H H H H HH HHH
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Chance and purpose

701chance&purpose.ppt

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Levels of reality

Physical level: ruled by laws of nature

Within physical level: appearance of EPR is matter of chance

**there is no equipment to measure purpose
there is no law of nature involving purpose**

Remains to be proven

Is there beside the physical level something real?

This can not be decided by physics.

Are there hints to assume non-physical reality?

Or with Ockhams's razor: non-physical reality should be excluded?

Need of philosophical analysis

In science:

there is no equipment to measure purpose

there is no law of nature involving purpose

→ need of analysis beyond physics: metaphysics

Two alternatives in a nondeterministic world

1. There is only chance.

2. There is also purpose.

Both are metaphysical statements.

Statement of E. Gilson

Chance is no explanation, it is the absence of any explanation.

Statement of Stephen Hawking

Up to now, most scientists have been too occupied with the development of new theories that describe what the universe is to ask the question why.

On the other hand, the people whose business it is to ask why, the philosophers, have not been able to keep up with the advance of scientific theories.

Stephan Hawking, A brief history of time, Bantam Books 1998.

Statement of De Broglie

As science progresses, it is constrained to introduce into its theories concepts of a metaphysical nature – like those of time, space, objectivity, causality, individuality.

....Science frequently ends up engaging in metaphysics without realizing it, and this is not exactly the safest way of doing metaphysics.

De Broglie, Revue de metaphysique et de morale, 1947, 3, p 278.

Statement of Albert Einstein-1

Every genuine theorist is some kind of occult metaphysician, no matter how much of a 'positivist' he may regard himself to be.

Albert Einstein, in *Ideas and Opinions by Albert Einstein*, Crown, New York 1954, p. 342.

Das ewig Unbegreifliche an der Welt ist ihre Begreiflichkeit.

The eternal un-understandable of the world is its intelligibility.

Albert Einstein, in A.D. Fokker, N.T.v.N. 21 (1955) 125-129.

Statement of Albert Einstein-2

God plays no dice!

**Evidently:
there is playing someone
sometimes dice.**

**On the level of natural causes:
there is chance.**



Statement of Albert Einstein-3

God plays no dice!

**Evidently:
there is playing someone
sometimes dice.**

**On the level of natural causes:
there is chance.**

**There is a higher, metaphysical
level of the first cause:
there is no chance.**



Analysis of causality (based on Aristotle)

The 4 aspects of causality

material

formal

efficient

final

important: all 4 aspects are present in any causal event

example: canon fired during defense of a city

different causes for the ball not reaching the target:

- because of bad quality gun powder,**
- because of wrong construction of canon,**
- because soldier was killed before firing,**
- because soldier was traitor who chose wrong trajectory.**

Final causality

Thomas Aquinas

Each action must have a certain character and should be directed to something. If that direction would be absent, then it would be an action without content, i.e. it would be no action at all. We therefore can state that somebody performing an action does it because of a purpose.

Problem: what about causes without intelligence?

in actions of pure physical and biological systems the final aspects (purpose) are present as they are directed to an aim by somebody else.

Now whatever lacks intelligence cannot move towards an end, unless it be directed by some being endowed with knowledge and intelligence

Thomas Aquinas, Summa Theologica I, quaest.2, art.3.

Final causality

Remarks on final causality in pure material objects:

- **Supposes chain of causality: first, second, thirdcause.**
- **At least one of the causes has to be an intelligent and free being.**
- **Accepting final causality one accepts intelligent and free beings.**

The approach of Scientism:

Restricting reality to pure physical or biological systems, one excludes final aspects of causality.

→ evolution is necessarily blind and directed by chance

→ order, complexity and beauty in nature is inherently un-understandable

The value of the scientific approach

The scientific analysis on its own has its merits and provides the basis of progress in knowledge and technology. Its full capacity, can only be exploited if open to all aspects of reality.

Final conclusion



picture:
Berend Vonk

***Science does not determine uniquely the Weltanschauung
(our view of the world)***

Gerard Nienhuis, University of Leiden

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The end



Fourteen billion years after the big bang.