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CONFLICT BETWEEN SCIENCE AND CHRISTIANITY

Classic Conflict Model: (Brooke, 33-42)

Facts vs. faith; science never wrong, theology never right, in warfare between them
Approach of Draper, White, Huxley

Complementarity Model:

Science and religion each answer a different set of human needs
Main problem is each getting on other's turf; should be kept separate
This is somewhat like Howard Van Till's position

Interaction Model:

Certain religious beliefs are conducive to the practice of science
Interaction between science and religion can work for the advantage of both
A. N. Whitehead and R. K. Merton favor this approach

Analysis:

Conflict approach is currently being panned by a number of historians of science;
See Colin Russell, J. H. Brooke; but want to avoid overreaction in other direction

What constitutes "science" and what "theology"?
(why should we expect theologians to be good scientists if scientists aren't good theologians?)
-- method: methodological naturalism/atheism?
-- goal: to find out how things really are?
-- content: what is known currently in various fields?
-- sociological: what scientists do?

Sociology of knowledge - desire for the truth not the only, often not even the main driving force behind group human endeavors; see this is true for various groupings within Christianity: denominations, congregations, schools, etc.; but also true in science, see Thomas Kuhn, *The Structure of Scientific Revolutions*

What is in Conflict?

Do we compare "science" with "Christendom" or "theology" or "evangelicalism" or what?

Compare "Bible" with "nature" (data)

Compare "theology" with "theoretical science" (method)

Compare "exegesis" with "experimental science" (interpretation)

Method or Goal?

Do we define "science" as a method?

explanation without recourse to miracle?

Do we define "science" as a goal?

trying to understand what actually exists?

Methodologically "science" and "exegesis" are very similar; in fact, no distinctive method divides various scholarly disciplines in such a way as to make science unique

Historically, as Brooke shows, the situation is a complex mixture of these various models of conflict, complementarity, interaction.

Is Theology Never Right?

This is somewhat unfair, as general revelation provides enormous detail, where Bible does not; and general revelation keeps exposing new pages every generation, while we have all the Bible and have for centuries

Still, if Bible is what it claims to be, and God of Bible really put together universe, then we should see some evidence it is right about nature, too

The Case of Matthew Maury (1806-1873): U.S. Navy oceanographer

First to recognize ocean as circulating system of currents involving interaction of air and ocean

Got idea from biblical figure of "paths in the sea" (Ps 8:8)

Thinking through what a path does on land (makes travel easier, faster), decided to investigate travel time by sea

Massive examination of ship's logbooks led to construction of charts for winds and currents

Maury came to be called "the pathfinder of the seas"

Jean Sloat Morton, *Science in the Bible* (Moody, 1978), 119-121.

Charles L. Lewis, *Matthew Fontaine Maury: Pathfinder of the Seas* (U.S. Naval Institute, 1927).

Christianity as a Basis for Modern Science

See R. Hooykas, *Religion and the Rise of Modern Science* (Eerdmans, 1972), 161-

162:

> Without claiming any intellectural superiority for the scientists of the Renaissance and Baroque periods over their ancient and medieval European predecessors or over Oriental philosophers, one has to recognize as a simple fact that 'classical modern science' arose only in the western part of Europe in the sixteenth and seventeenth centuries .... from this point on, anyone with the necessary talent may help build up science on solidly established foundations. Scientists from nations whose own culture did not give birth to anything like modern science have already made valuable contributions to it. Western people who have lost all contact with the religion of their forefathers continue in their scientific activities the tradition inherited from them.
> ...
> The confrontation of Graeco-Roman culture with biblical religion engendered, after centuries of tension, a new science. This science preserved the indispensable parts of the ancient heritage (mathematics, logic, methods of observation and experimentation), but it was directed by different social and methodological conceptions, largely stemming from a biblical worldview. Metaphorically speaking, whereas the bodily ingredients of science may have been Greek, its vitamins and hormones were biblical.

Creation and Modern Cosmology

See Robert Jastrow, *God and the Astronomers* (Norton, 1978), closing paragraph (p 116):

> For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been there for centuries.

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THE HERMENEUTICS OF BIBLICAL DESCRIPTIONS OF NATURE

Ramm's Characteristics of Biblical Language:

Popular rather than technical
- Actually have little knowledge of what technical terms existed in classical Hebrew; NT uses some Greek technical terms (e.g., Hobart, *Med Lang St Luke*)
- Presumably Bible designed for a general audience rather than specialists, and (from God's perspective) for multiple centuries and cultures

Phenomenological rather than mechanical
- e.g., "sun rises," "seed dies," etc.
- "Mechanical" not good term, perhaps theoretical; in any case, this is strongly linked to next item

Does not theorize
- Describes what happens, but tends to focus on ultimate cause (God did it) rather than mediate causes
- But not always, e.g., presence of wind in opening Red Sea
- See also Job 1 and 2 re/ Satan's activity in producing material effects in nature
- Better Snow's remark in *Portraits of Creation*, 14:
  > "[Scripture has] a notable lack of systematic discussion concerning the ordered relationship linking phenomenon to phenomenon within the ordered world"

Cultural terminology
- Uses standard terms in host language for such things as time, psychology, medicine, measurements, etc.
- Helpful to remember that Hebrews didn't invent Hebrew, nor Xns invent Greek (tho Greek of NT heavily influenced by LXX)

These features put greater burden on people who are more educated, more sophisticated, which is in keeping with biblical principle that "to whom much is given, much is required."

Science and Theology in Scripture:

Ramm sees (saw) no scientific error in Scripture (vs. Rust), but no scientific teaching either (also vs. Rust); H. Van Till holds something close to this position

I have some reservations about applying our modern science/ theology distinction to Scripture; the remarks in "Some Characteristics of Biblical Language" above apply to some extent to theological statements of Bible also.

Particularly in the area of origins, it seems problematical to assert the Bible gives no scientific information. Why not scientific information in popular language? See Dallas Cain's work in progress "Translating Genesis One in the Light of Modern Scientific Findings"; [see his book on IBRI website, www.ibri.org]

I see no scientific error, but am willing to look for evidence of scientific teaching to see if actually present; I find some in astronomy and medicine (see, e.g., Newman and Eckelmann, *Genesis 1 and the Origin of the Earth*, and McMillen and Stern, *None of These Diseases*).

Distinguishing Literal and Figurative Usage:

Not always easy, but both certainly exist in Scripture.

Want to reject a "methodolical literalism" which tries to avoid figures at nearly any cost

Want to avoid allegorization, other mystical approaches (numerology) which find figure, symbol when author(s) did not intend such.

How do we recognize a figure?

How in literature in general? (Hirsch, 198)
validation via probability
generic validation (external/internal)
small-scale validation (also ext/int; takes priority over generic)

How in Scripture in general? (Berkhof, 84-85)
genre - is figure allowed in this type?
sense - literal unless contradiction/absurdity
(Berkhof is somewhat too strong here, but give benefit of doubt to author, esp where inspiration/revelation understood)

context - internal helps, most important

How in "science" passages?
validation via probability
don't be dogmatic
genre
don't invent special genres
test various alternatives:
narrative, teaching, poetry
sense - does it contradict well-established observation?
author - e.g., Satan, Job, friends, God?

How do we recognize a standpoint?

e.g., for figure "death as sleep" - from whose perspective?

Is creation account to be read as though we are observing from outer space or from earth's surface?; is it to be read as though speaking to scientists, theologians, man in street?

How do we recognize a genre?

e.g., narrative, parable, teaching, exhortation, proverb
e.g., the Bible says, "There is no God"
true, but this is a quotation of speaker identified as a fool
Is Matthew "midrash" a la Gundry?
Is Jonah "parable"?
Is Song of Solomon "allegory"?
Is Genesis 2 "parable"?

BIBLICAL VIEW OF NATURE

Contrast this with other worldviews, including scientisms of various sorts

Created (Gen 1:1, etc.)
probably most basic feature of nature acc to Scripture
finite - had beginning, prob limited in size
artifact – made by God, didn't happen by itself
vs. eternal - nature has not always existed
vs. divine - not to be worshipped
vs. accidental - made by God's wisdom

Good (Gen 1:31 and several times earlier)
- vs. neutral
- vs. accidental
- vs. bad, according to Gnostics

Revelatory (Ps 19:1; Rom 1:18-20)
- shows God's character as an artifact shows craftsman's
- reveals God's glory (importance, that which is unique?)
- reveals God's divine nature, eternal power
- teleology a natural consequence
- vs. accidental
- vs. meaningless

Orderly/Uniform (Gen 8:22; material on covenant. etc.)
- inexplicable even in modern science
- vs. random, chaotic
- vs. work of committee

Controlled (Rom 8:28; Isa 44:24-28)
- everything under God's control, working out his purposes
- vs. accidental

Cursed (Gen 3:17; Rom 8:20 and Eccl)
- some uncertainty re/ scope of this
- vs. made imperfect, or still evolving

Stewardship (Gen 1:28; Ps 8)
- ecologists want something of this sort, but get tangled in priorities

Finite (Gen 1; Ps 147:4; Rev 21, 22)
- has a beginning, prob a finite size
- some sort of end, but (renewed) will last forever

Open (Gen 18; Ex 3; Josh 5; Job 1-2, 38-42)
- vs. closed
- not typically given much attention by Xns in science or even theology; perhaps a reaction to medieval & charismatic extremes
- universe more like a guitar than a watch
- Van Till's "functional integrity"?
  - problems here; if "functional integrity of science," why not of history? but this is Bultmann!

Visible Part of Larger Realm (2 Kings 6; Job 1-2; Matt 17)
- related to "open" above

universe not explicable from within
not all causation internal
universe as stage, history as novel

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THE ANTHROPIC PHENOMENA: DESIGN OR CHANCE?

Since Hugh Ross will be doing some of this, want to look at just a few examples, emphasize attempts to avoid Designer here; look at John Jefferson Davis and Alan Rhoda

Some Examples:

Water (see Barrow and Tipler, 524-541):

"one of the strangest substances known to science" (524)
"most of its ... physical properties have values enormously higher or lower than those of any other known material" (524)
properties noted in *Bridgwater Treatises* (1830s) and in Lawrence J. Henderson, *The Fitness of the Environment* (Glouster, MA: Smith, 1913)
very high melting point, boiling point, heat of fusion (524-26)
heat of vaporization higher than any other known substance (527); **best possible coolant** by evaporation
very high surface tension (537)
high dielectric constant (537-38); **great solvent** for polar molecules; water itself **tends to ionize**
almost unique in having solid state lighter than liquid (524, 533), so **expands on freezing**; prevents freeze-up of lakes, rivers, oceans; aids soil formation
higher specific heat than almost all *organic* compounds (ammonia higher). so

functions very well as heat source/sink, **stabilizing temperature** of environment (534)

these features perhaps "boil down" to three?
(1) hydrogen bonds (nature of H and O)
(2) polar molecule
(3) angle between bonds

Other Life Elements

Barrow and Tipler also discuss "anthropic significance" of hydrogen, oxygen, carbon (see esp 545-58), nitrogen, phosphorus and sulfur

Electromagnetism and Gravity (see Adair, *Great Design*, 321)

Both these basic forces are long-range, each decreasing as the square of the distance

E-M is enormously stronger than gravity, by some 37 powers of ten, yet gravity dominates on the astronomical size-scale, allowing hot suns and cool planets, and life as we know it

Why does gravity dominate when so much weaker?

Gravity has only an attractive force, "mediated" by mass, which is only positive; like masses attract

E-m has both attractive and repulsive force, "mediated" by charges, which are either positive or negative; like charges repel, unlike attract

Thus e-m force tends to cancel out, so long as there are equal numbers of positive and negative charges

But for e-m not to dominate, its charges must cancel out to much better than one part in 10 to the 37, perhaps 1 in 10 to the 40 or so

Not obvious why this should be so, since electrons are main carriers of negative charge, protons of positive, and these "froze out" at very different times in the expansion of the universe

Attempts to Avoid a Designer: Davis, Rhoda

Anthropic Principle: the universe is the way it is because of mankind

Strong Anthropic Principle: man caused the universe to be the way it is so that he/she could arise! (Barrow, Wheeler)

Either mankind is a manifestation of God (monism) or causes can operate backward in time
Little reason to believe either of these without strong evidence

Weak Anthropic Principle: if the universe weren't the way it is, there would be no observers; conversely, since there are observers, the universe must be sufficiently fine-tuned to permit them to exist

Selection effect: apparent design is the result of selection (as in "blind watchmaker" version of evolution), though not the Darwinian natural selection.

But variables are so fine-tuned, it is an enormous surprise that there *are* any observers! Compare Leslie's illustration, "if the 1000 marksmen on the firing squad hadn't missed me, I wouldn't be here to discuss the fact, so why be curious?"

Postulate a large ensemble:

1. successive oscillations of universe (Wheeler)
2. quantum many-worlds (Everett)
3. inflationary many-worlds (Leslie)

but #1 won't work (Hawking)
no evidence for #2
#3 possible, but evidence for other universes not comparable to evidence for God

If God exists, anthropic principle coincidences "no surprise"; if He doesn't, even the need for "fine tuning" rather amazing, not to mention that we actually have it.

Thus the "God model" naturally explains fine-tuning, "no-God model" must make huge assumptions to account for it.

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RECENT DEVELOPMENTS IN PHYSICS: IMPLICATIONS FOR THEOLOGY

The Quantum World

Quick tour of quantum phenomena:
- photelectric effect - light absorbed as units
- discrete energy levels in atoms, nuclei
- particle nature of light \ wave-particle
- wave nature of electron, etc. / duality

Quantum theory
- quantum objects described by probabilty/potentiality wave function, which "collapses" on interaction

Partly an epistemological effect
- investigating size-scales where observational tools disrupt structure - light is not infinitely divisible, but comes in "atoms" called "quanta"

But not only epistemological
- above, re/ quanta
- two-slit experiment - electron knows about other slit?
- EPR paradox - instantaneous effects at a distance?
- there is really something non-local about nature!

Various metaphysical models for quantum phenomena
(massaging lists given in Davies/Brown and Herbert)

- Copenhagen Interpretation (Bohr, Heisenberg)
  - prevailing view in physics today
  - no deep reality in absence of measurement
    - (unobserved world is only potentialities)
  - measurement collapses wave function

(observed world is actualities)
huge problem of how micro world transitions to macro

Mind Over Matter Interpretation (Wigner, von Neumann)
conscious observer collapses wave function
consciousness necessary to universe
problem of transition to consciousness
(humans are conscious; are animals, bugs, plants?)
Schrödinger's cat

Many Worlds Interpretation (Everett, Davies)
no collapse of wave function
instead, multiplication of universes
problem of conservation laws
(if nothing conserved *between* universes, why anything conserved *within* them?)

Neorealism (Einstein, Planck, Schrödinger, Bohm)
world made of objects possessing attributes whether observed or not

Undivided Wholeness Interpretation (Bohm, Capra?)
world a seamless whole
real values of variables
but "locality" abandoned
"togetherness" undiminished by distance

Summary: see that "particle-contact" and "field-wave" views of reality have in fact been research programs rather than "the way things are"; and they have now encountered contradicting evidence

Relativity

Like quantum, seems to mock at common sense

Special relativity
phenomena:
absolute speed limit
length contraction
mass increase
time dilation
inability to specify absolute frame of reference
not strictly new; this might have been so in Newtonian physics
relativity of space and time intervals to observers:
follows from absolute value of speed of light (in vacuum) for all observers

unpacks actual contradiction between equations of Newton for motion and of Maxwell for e-m

General relativity
attempt to generalize relativity by including acceleration
found link between mass and space curvature
black holes, twin paradox
reinstates possible preferred obervation frame

Open vs Closed Universe

Two uses of phrase "closed universe":
-- nothing outside that can penetrate
-- universe will eventually collapse

Former more common in theological discussions, latter in cosmological

Looked at former under "Biblical View of Nature"
so here consider latter

Some form of "big-bang" cosmology has driven out competitors

Varieties of "big-bang" cosmology (one classification):
1. oscillating (popular until recently)
2. one-bounce (Gamow)
3. no-bounce (Lemaitre)

Problems with stopping expansion (#1)
doesn't look like enough matter to overcome expansion speed
additional matter may turn up, but early production of helium and deuterium says no

Problems with bouncing cosmologies (##1 & 2)
no known force to stop contraction
gravity overcomes all at high enough densities
move into black hole rather than bouncing
even repulsive force won't work (Jastrow)
$E = mc^2$ leads to additional effective mass
entropy of universe too low for having been through bounce (Hawking)
problems appear insuperable

Chaos Theory

Chaos observed in fluid flow (laminar to turbulent) for many years; so differential equations of fluid flow are a mess!

Butterfly effect - work with equations of meteorology (which is fluid flow) show that long term prediction impossible due to non-linear nature of equations

Recent interest sparked by finding chaotic phenomena in numerous simple systems, incl planetary motion

Chaotic system - solutions with arbitrarily close initial conditions eventually diverge drastically, so no matter how accurate you measure initial conditions, you know nothing about state of system once a significant period of time has passed

Clearest message is limitation on human ability to predict future

Some are hoping that chaos theory will produce arbitrarily large levels of order without a designer; this appears to be whistling in the dark.

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