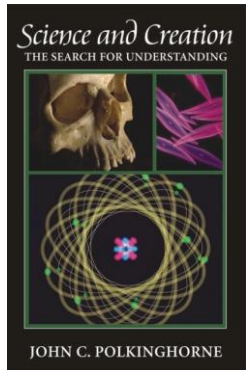
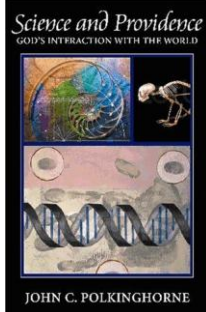
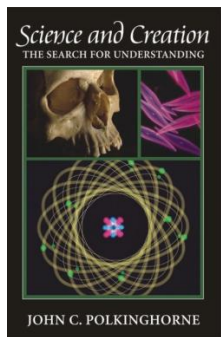
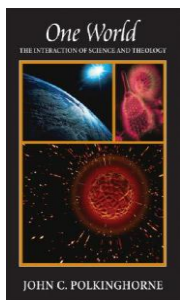


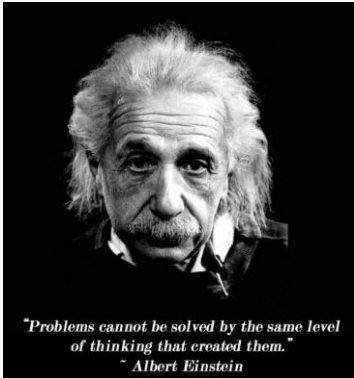


Born 1930

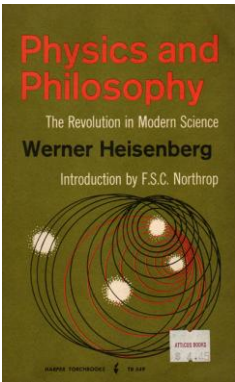




- Science is usually thought to be based primarily on observation. However, Galileo and Newton based their ideas primarily on mathematics. Mathematical analysis and idealized conditions were two methodological changes that characterized the Scientific Revolution in the sixteenth and seventeenth and centuries.

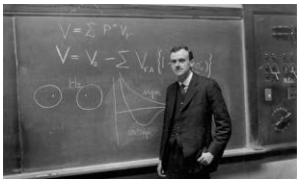


• ‘The most beautiful and most profound experience is the sensation of the mystical. It is the sower of all true science. He to whom this emotion is a stranger, who can no longer wonder and stand rapt in awe, is as good as dead. To know that what is impenetrable to us really exists, manifesting itself as the highest wisdom and the most radiant beauty which our dull faculties can comprehend only in their primitive forms - this knowledge, this feeling is at the centre of true religiousness.’
(Albert Einstein - The Merging of Spirit and Science)



Beyond Language

- The problems of language here are really serious. We wish to speak in some way about the structure of the atoms ... But we cannot speak about atoms in ordinary language.
- Every word or concept, clear as it may seem to be, has only a limited range of applicability.
- The most difficult problem ... concerning the use of the language arises in quantum theory. Here we have at first no simple guide for correlating the mathematical symbols with concepts of ordinary language: and the only thing we know from the start is the fact that our common concepts cannot be applied to the structure of the atoms.



Paul Dirac:
The man who conjured laws of nature
from pure thought

- These discoveries involve no experiment, no apparatus and no observation
- . When quizzed about his achievements and their significance, he declines to explain, saying that quantum theories are built up "from physical concepts which cannot be explained in words at all".

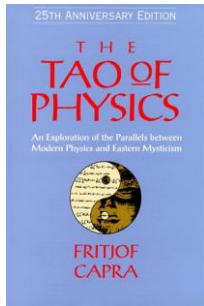
- He proposed anti-matter not on the basis of physical observation, but because his own mathematical logic told him that it must exist.
- 'Dirac's prediction of anti-matter stands alone in being motivated solely by faith in pure theory, without any hint from data, and yet revealing a deep and universal property of nature'

- 'It is more important to have beauty in one's equations than to have them fit experiment... God is a mathematician of a very high order, and he used very advanced mathematics in constructing the universe'. Dirac

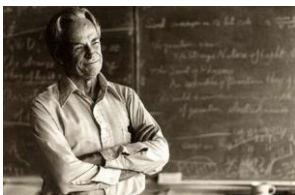
- Dirac: 'creation was one vast bang. Talk of a steady state is nonsense'
- Questioner: But if nothing existed beforehand, what was there to bang?
- Dirac: That is not a meaningful question.



Born 1939



- The opening line of the Tao Te Ching: 'The Tao that can be expressed is not the eternal Tao.' (Lao Tzu)
- Well known Zen phrase: "The instant you speak about a thing you miss the mark."



Richard Feynman:
"If you think you understand quantum mechanics,
you don't understand quantum mechanics".

- Science is the adventure into the unknown, an unknown which must be recognized as being unknown in order to be explored; **the demand that the unanswerable mysteries of the universe remain unanswered; the attitude that all is uncertain.**

Polkinghorne – *Science and Creation*

- 2 themes:
- Is Natural Theology possible?
- What doctrine of Creation fits with modern science?

- The key points P wants to prove are
- We can have knowledge –even if not complete knowledge - both about the world and about God.
- There is a similarity between scientific and theological method. Both involve a combination of interpretation and data
- There is need for both in order to have full understanding of how things are

- Appreciation of 'the rational transparency and rational beauty of the universe....arise from the pursuit of science, but lie beyond its self-limited intellectual horizon..... They are signs of the presence of the mind of that world's creator' i.e avoids 'God of gaps' challenge
- (xi – P rejects ID as an argument for God – because science shows emergence of complexity is explicable without divine intervention, and divine intervention is theologically unacceptable)

Chapters 1 and 2 – Natural Theology

- Old concept of Natural Theology was weakened by Darwin. But Nat Theology revived in second half of 20th century, seeing theology as complementary to science

Chapters 3 and 4

- Process of the world involves interplay between being and becoming, necessity and chance, order and disorder, determinism and freedom
- 'Fertility and freedom are bestowed by the Creator on Creation'. How? This implies divine kenosis.

- An apparent dilemma arises when Christian theology posits a God outside of time and space, who enters into time and space to become human (Incarnate). The doctrine of Kenosis attempts to explain what the Son of God chose to give up in terms of his divine attributes, in order to assume human nature. Since the incarnate Jesus is simultaneously truly human and truly divine, Kenosis holds that these changes were temporarily assumed by God in his incarnation, and that when Jesus ascended back into heaven following the resurrection, he fully reassumed all of his original attributes and divinity.

Chapter 5

- ‘Dual aspect monism’ as a way of doing justice to both mental and physical levels of experience.

Chapter 6

- P’s confidence in ultimate unity of knowledge via ‘liturgy-assisted logic’. Prayer plays the role in theology that experiment plays in science.

- Kinship of science and theology in seeking understanding of the way things are (doing science raises questions which go beyond the horizons of science): both involve critical realism.
- Possibility of developing a revised Natural Theology?
- Anthropic principle raises questions to which the Christian concept of God is the best answer.
- Being and becoming as features of a universe in which there is combination of order and creative freedom.
- Kenosis as explanation of how God relates to the universe.
- How can there be a place for mind or soul in the universe as understood by modern science? Dual aspect monism.
- Nature-assisted logic and liturgy-assisted logic.

Polkinghorne

- He "does not assert that God's existence can be demonstrated in a logically coercive way (any more than God's non-existence can) but that theism makes more sense of the world, and of human experience, than does atheism."

- He suggests that God is the ultimate answer to Leibniz's great question "why is there something rather than nothing?" The atheist's "plain assertion of the world's existence" is a "grossly impoverished view of reality," he says, arguing that "theism explains more than a reductionist atheism can ever address."

He cites in particular the intelligibility of the universe:

- One would anticipate that evolutionary selection would produce hominid minds apt for coping with everyday experience, but that these minds should also be able to understand the subatomic world and general relativity goes far beyond anything of relevance to survival fitness. The mystery deepens when one recognizes the proven fruitfulness of mathematical beauty as a guide to successful theory choice.

- Because scientific experiments try to eliminate extraneous influences, P believes they are atypical of what goes on in nature. He suggests that the mechanistic explanations of the world that have continued from Laplace to Richard Dawkins should be replaced by an understanding that most of nature is 'cloud-like rather than clock-like'.

- On the anthropic fine tuning of the universe: He quotes with approval Freeman Dyson, who said "the more I examine the universe and the details of its architecture, the more evidence I find that the universe in some sense must have known we were coming".
- But P doesn't claim the anthropic features prove the existence of God. He places more weight on the rational intelligibility of the universe.
