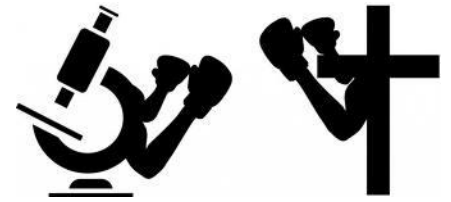


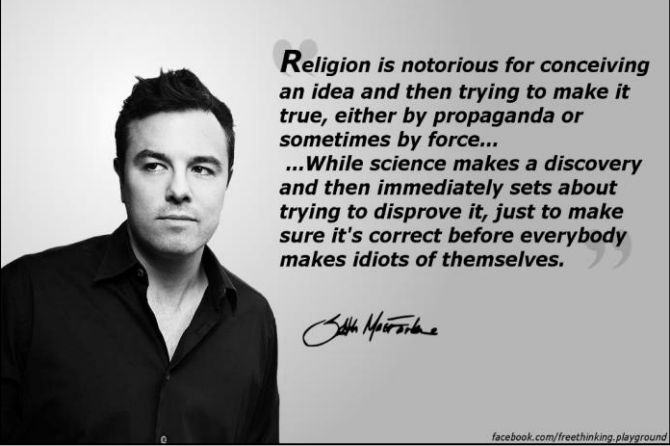
# Topic 7a: Science as a belief system

## Links to specification:

- Know the difference between open and closed belief systems
- Understand and be able to evaluate different views of science as a belief system



Key concepts	Definitions
Open belief system	A system, e.g. science, where every scientist's theories are open to scrutiny, criticism, and testing by others (Popper 1959)
Falsification	Where scientists set out to try and falsify existing theories, deliberately seeking evidence to disprove them. (Popper 1959)
Cumulative knowledge	Due to the discarding of falsified knowledge, scientific understanding of the world grows – scientific knowledge builds on the achievements of previous scientists to develop a greater and greater understanding of the world. Scientific knowledge can always be questioned, criticised, tested and perhaps found to be false. (Popper 1959)
CUDOS	Merton argues science needs an 'ethos' or set of norms in order to thrive: <b>Communism/community</b> – scientists must share knowledge with the scientific community (publish their findings) <b>Universalism</b> – there must be universal, objective criteria (e.g. testing) of scientific knowledge which all scientists abide by <b>Disinterestedness/Directness</b> – Scientists are not interested in anything else but advance scientific understanding <b>Organised scepticism</b> – there is respect within the community – along with healthy scepticism of others work.
Closed belief system	e.g. Religions that make knowledge claims that cannot be challenged and remains unchanged. They claim to have a monopoly of the truth.
Circularity	Each idea in a system is explained in terms of another idea within the system and so on, round and round (feature of a closed system)
Subsidiary explanations	If something within the system fails, it's due to incorrect use or incorrect practices
Denial of legitimacy to rivals	Alternative belief systems are rejected and not given legitimacy, e.g. creationists reject evolutionists' claims that the earth is billions of years old and that species have gradually evolved.
Paradigm	A shared set of assumptions. For example in science the paradigm tells scientists what reality is like, what problems to study and what methods to use.
Scientific revolution	Kuhn (1970) argues that an accumulation of anomalies will undermine the faith in the truth and eventually lead to a scientific revolution where scientists will become open to new ideas.
Ideology	It is a worldview or a set of ideas and values – a belief system. For example Marxism argues there is a ruling class ideology – ideas that legitimate or justify the status quo.
Meta-narratives	Postmodernists argue that science is one of a number of meta-narratives or 'big stories' that falsely claim to possess the truth.
Technoscience	Some postmodernists similar to Marxists argue that science has become a <i>technoscience</i> , simply serving capitalist interests in producing commodities for profit.

Science is an <b>OPEN</b> belief system	Science is a <b>CLOSED</b> belief system
<ul style="list-style-type: none"> <li>• <b>Popper</b> (1959) argues science is governed by <i>falsification</i> meaning that knowledge is <i>cumulative</i> constantly growing and improving.</li> <li>• <b>Merton</b> (1973, 2007) argues science is an open belief system under <i>CUDOS norms</i></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Polanyi</b> (1958) argues science is a closed belief system that sustains itself through <i>circularity</i>, <i>subsidiary explanations</i> and <i>denial of legitimacy to rivals</i> (e.g. see Box 1.4 The case of Dr Velikovsky p61)</li> <li>• <b>Kuhn</b> (1970) argues science works within a <i>paradigm</i>. It takes a <i>paradigm revolution</i> for scientists to be open to new ideas, but this is rare. <i>Interpretivists</i> take this further and argue that all scientific knowledge is a <i>social construction</i>.</li> <li>• <b>Marxists</b> argue that science serves the interests of the ruling class, e.g. theoretical work on ballistics (study of the path followed by objects under the influence of gravity) was driven by the need to develop and sell weaponry.</li> <li>• <b>Feminists</b> argue that science serves the interests of men. Biological ideas have been used to justify male domination – e.g. in the past women being excluded from education on the grounds of brain inferiority</li> <li>• <b>Postmodernists</b> argue science is a <i>metanarrative</i> falsely claiming to know the truth.</li> </ul>
 <p>Religion is notorious for conceiving an idea and then trying to make it true, either by propaganda or sometimes by force...  ...While science makes a discovery and then immediately sets about trying to disprove it, just to make sure it's correct before everybody makes idiots of themselves.</p> <p>Seth Horvath</p> <p><small>facebook.com/freethinking.playground</small></p>	

**Practice questions:**

- Outline and explain two criticisms of the view that religion is an open system* (10 marks)
- Outline and explain two ways in which science differs from religion.* (10 marks)
- Applying material from Item A and your knowledge assess the view that science has replaced religion as the main ideological influence in society today* (20 marks)

