

## **Holmes and the indelicate question: Measuring the depth of time with the clocks of the earth**

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The development of geology involved several great controversies, long-standing conflicts with the forces of organized religion, and with the dogma of other scientific disciplines. The fierce and acrimonious debate about the true age of the Earth was perhaps the most important of such conflicts, because so many other ideas in science - notably evolution - depend upon this foundation. One hundred years ago, long before his career was established, a young geologist named Arthur Holmes wrote an eloquent book in which he evaluated the ideas of the times, and outlined the principles for what we now call geochronology. Holmes was the very first timekeeper of the Earth and although remembered mostly as the father of geological time scales, he had a profound influence on many other aspects of our science.

The debate around the age of the Earth involved some famous names, such as James Hutton, Charles Darwin, Lord Kelvin, Henri Becquerel, Marie Curie and Ernest Rutherford. It pitted the fluid observational science of geology against the firm bastion of 19th century physics, then ruled by intransigent dogma. But in the end its resolution actually came from within physics, with the world-changing discoveries of radioactivity and subatomic particles. Ironically, the clock that gives us the power to unravel the history of the Earth is the very same substance that gives us the potential to destroy it forever. This lecture will trace the course, characters and ideas of this great debate, and also explain how modern geochronology works, and why we must have confidence in its findings. Arthur Holmes died fifty years ago, but his legacy remains vital even in our 21st century, when fundamental scientific knowledge continues to be challenged through the irrational faiths of creationism and so-called 'intelligent design'.