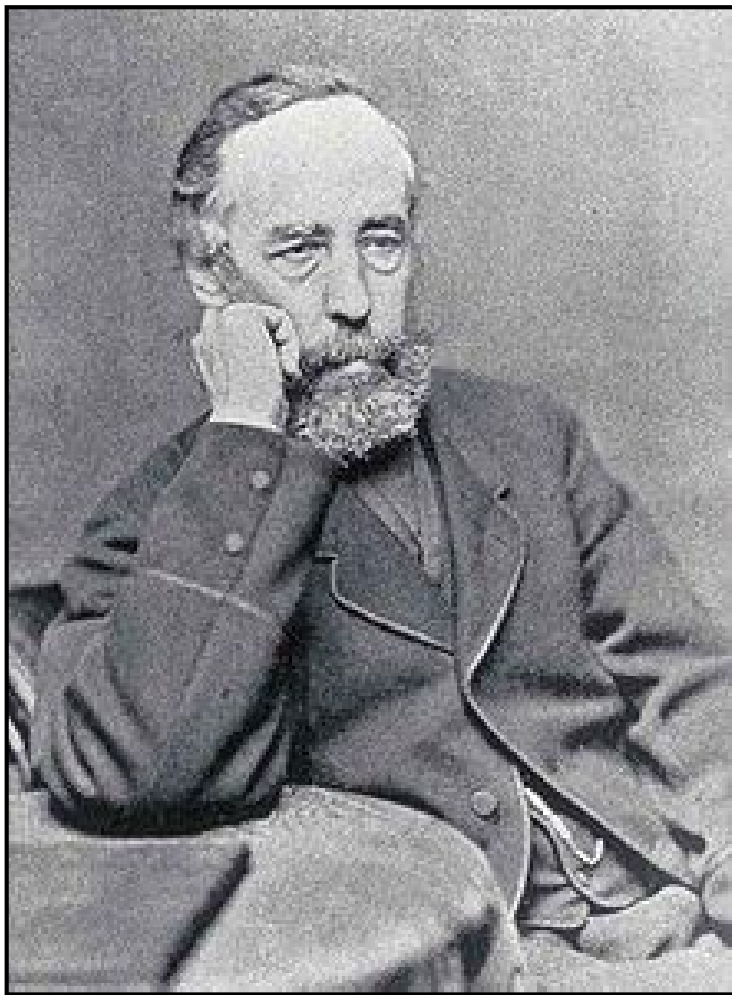


The history of climate change

Prof. Roy Thompson



James Croll - visionary 19th-century Scottish scientist (1821 – 1890)

When James was three years old, the family croft was cleared by the landowner, Lord Willoughby, and displaced to an area of bog-land a mile to the west at Wolfhill.

**Probable birthplace, Little Whitefield,
Tuesday 2nd of January 1821**

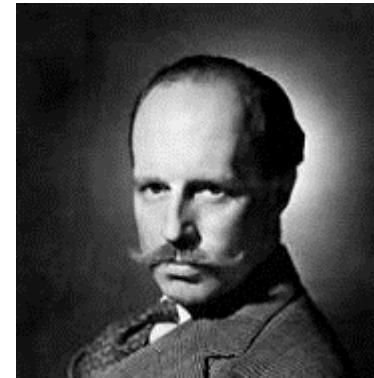
Little Whitefield,
near Wolfhill.



Jordan Bank



David Ramsay Hay FRSE (1798 - 1866)
Artist, interior decorator & art theorist



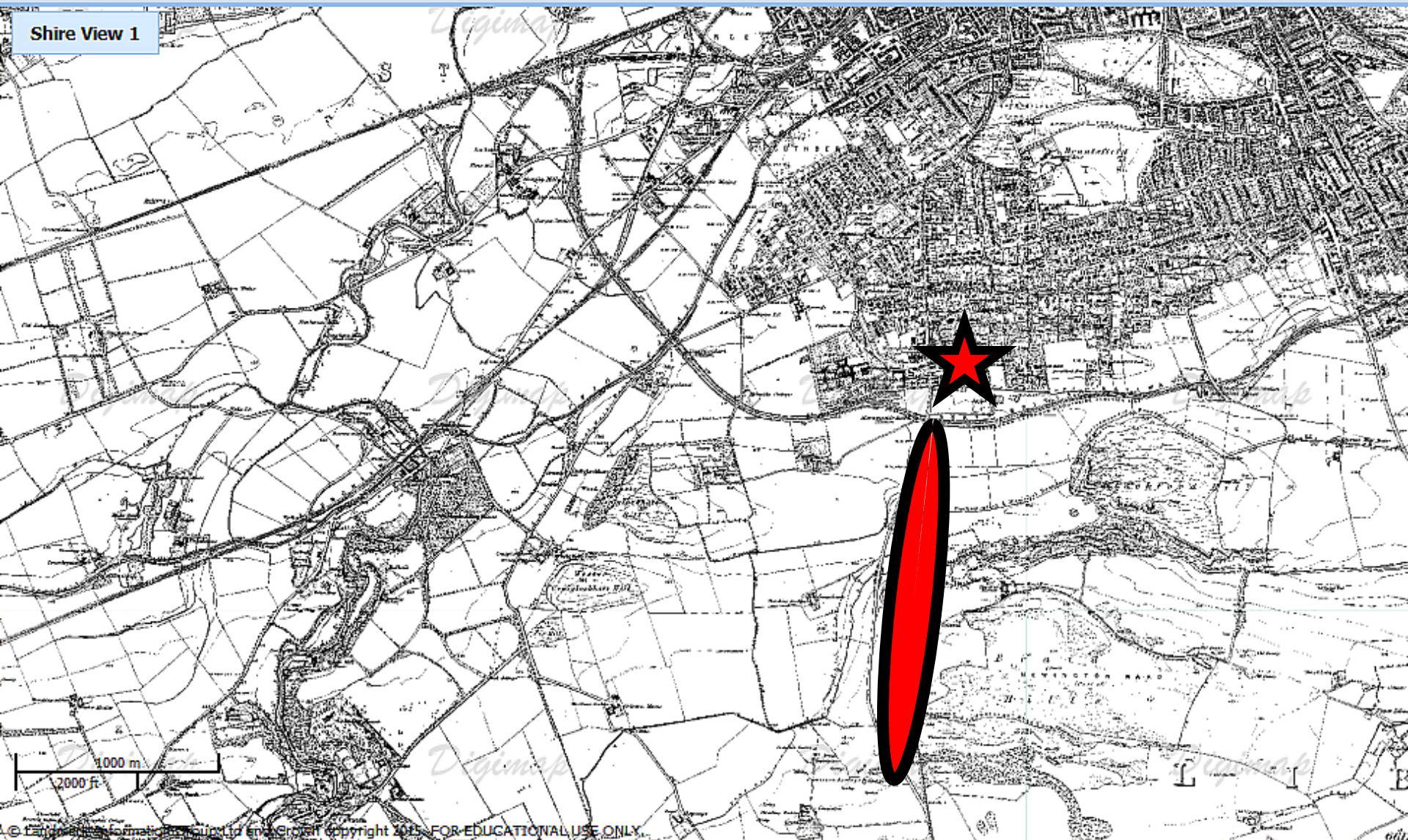
Sir Basil Urwin Spence, OM, OBE, RA
(1907 – 1976)



1840s 1850s 1860s 1870s 1880s 1890s 1900s 1910s 1920s 1930s 1940s 1950s 1960s 1970s 1980s 1990s Contemporary

Open Save Print...

Shire View 1





The Clock, Morningside Road, Edinburgh.

3636.

India Buildings

In 1869 the Geological Survey was based in No.1 India Buildings, Victoria Street.

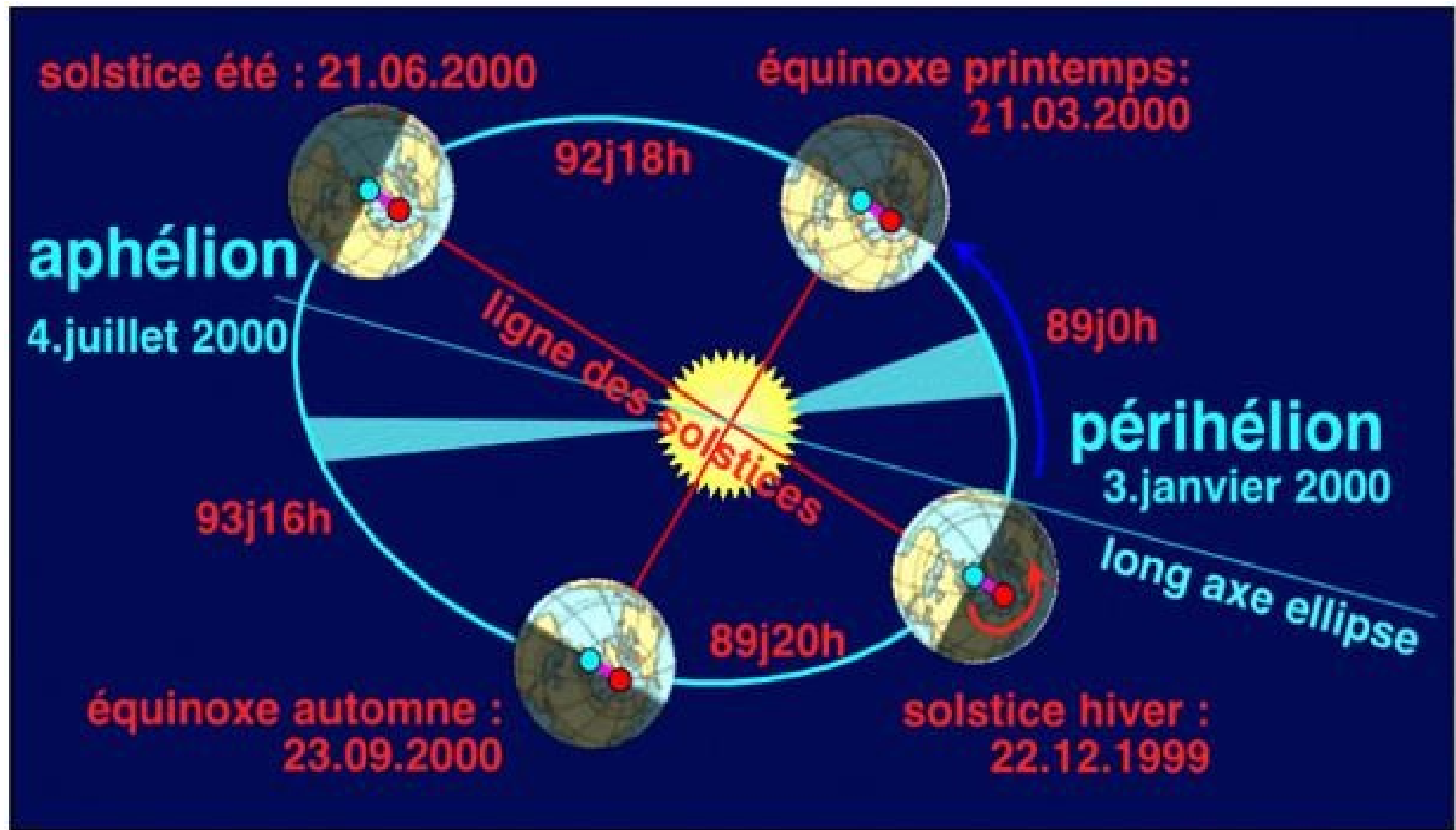


Scottish Survey staff in 1868.

Standing, (left to right) J. Geikie, J. Horne, J. Croll, C. R. Campbell, B. N. Peach, D. R. Irvine, T. M. Skae, and R. L. Jack. Seated, E. Hull and A. Geikie.



2. Correctly interpreted the influence of eccentricity on the duration of the seasons, and hence on climate



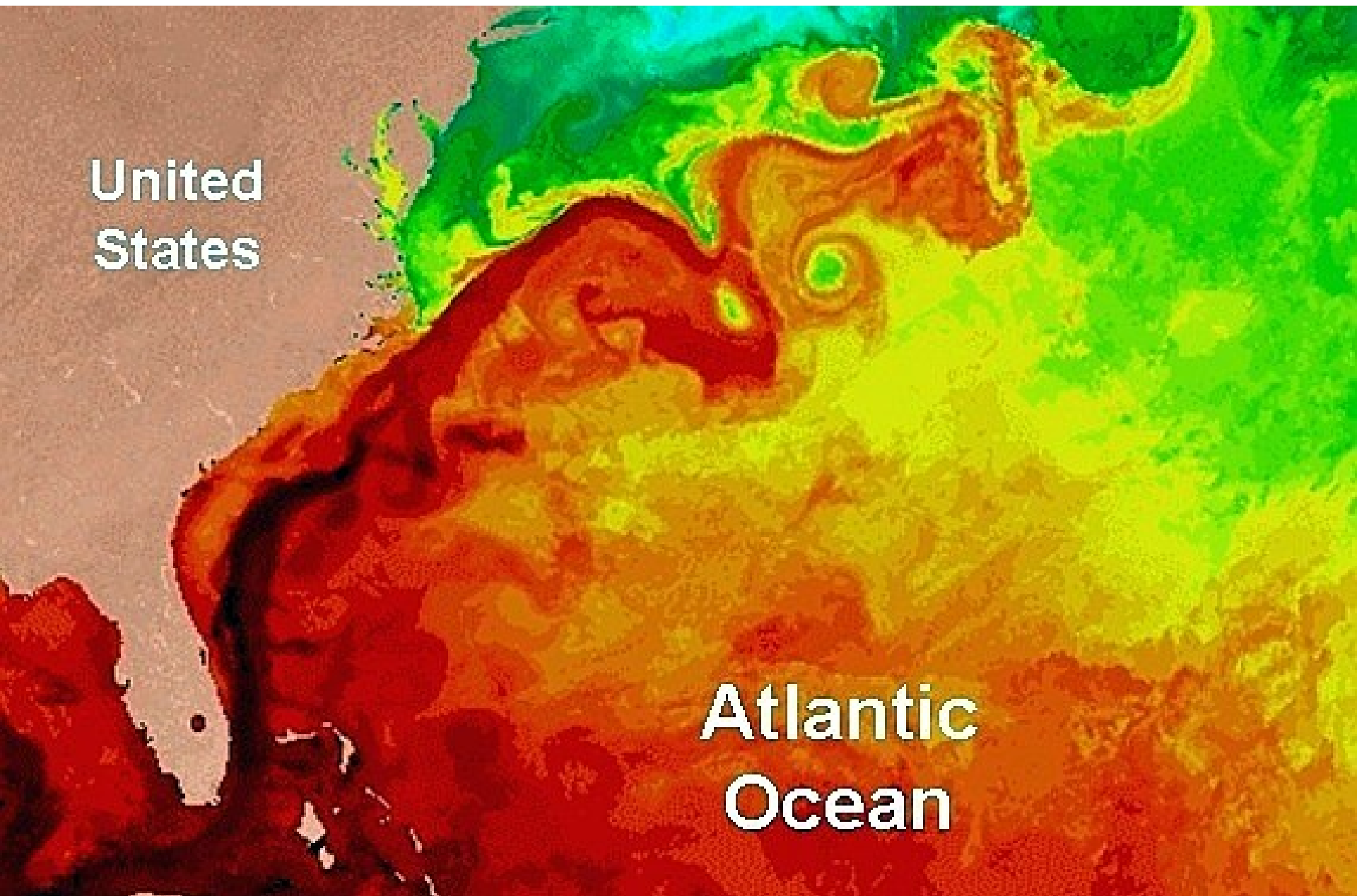
Aphélie : point le plus éloigné
329 W/m²

Périhélie : point le plus proche
351 W/m²

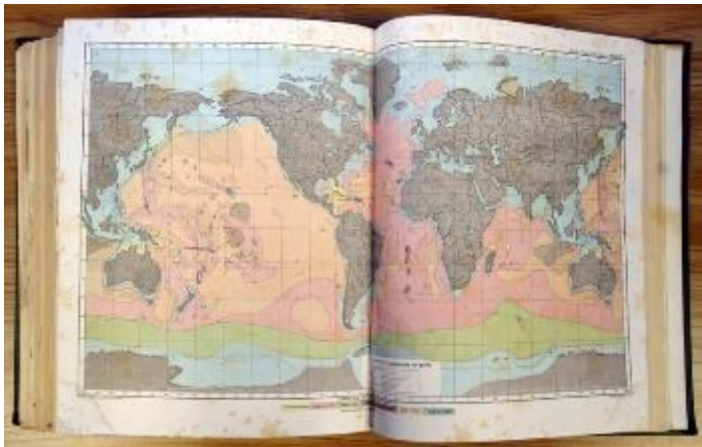
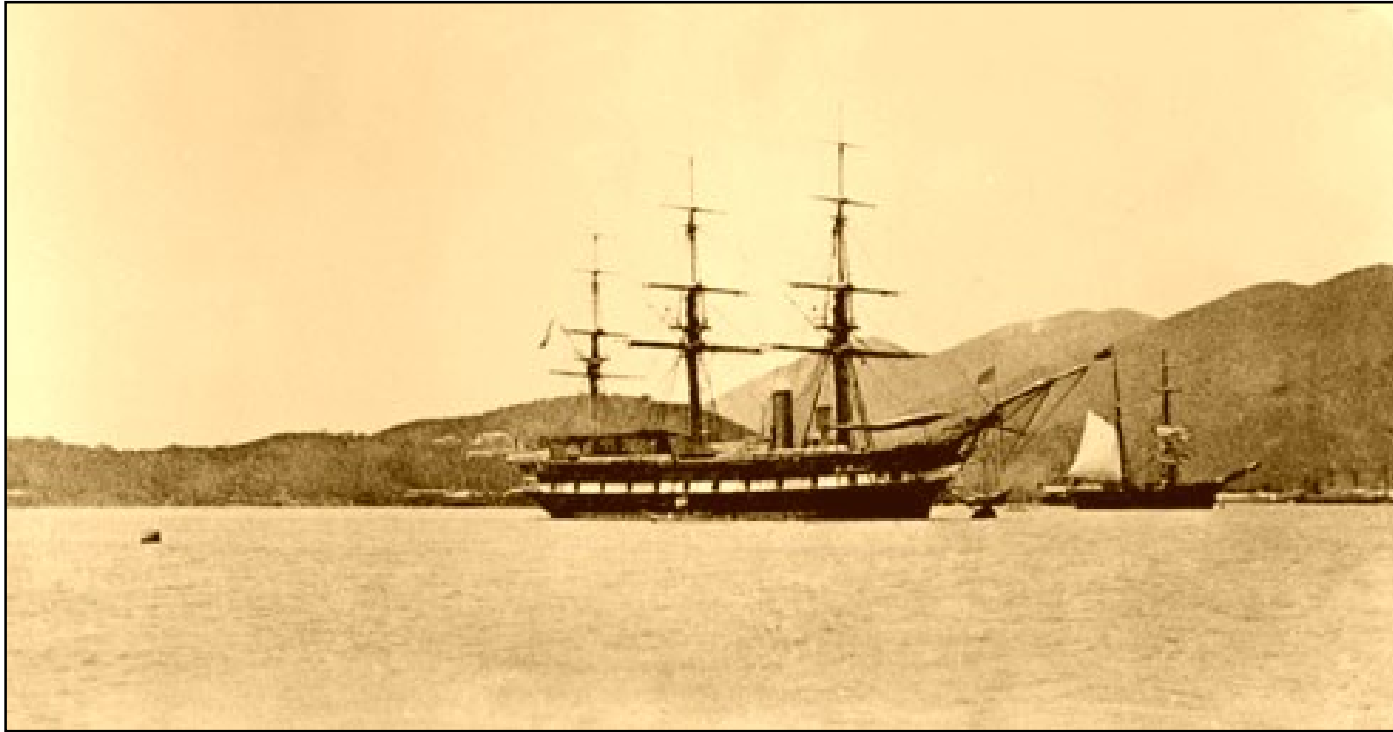
3. Recognised there had been a multiplicity of ice ages, to the uproar of Lyell and his associates still clinging to their misguided iceberg and uplift theories.



4. Developed an original (and essentially correct) theory of the physical cause of ocean currents to be the prevailing winds of the globe.

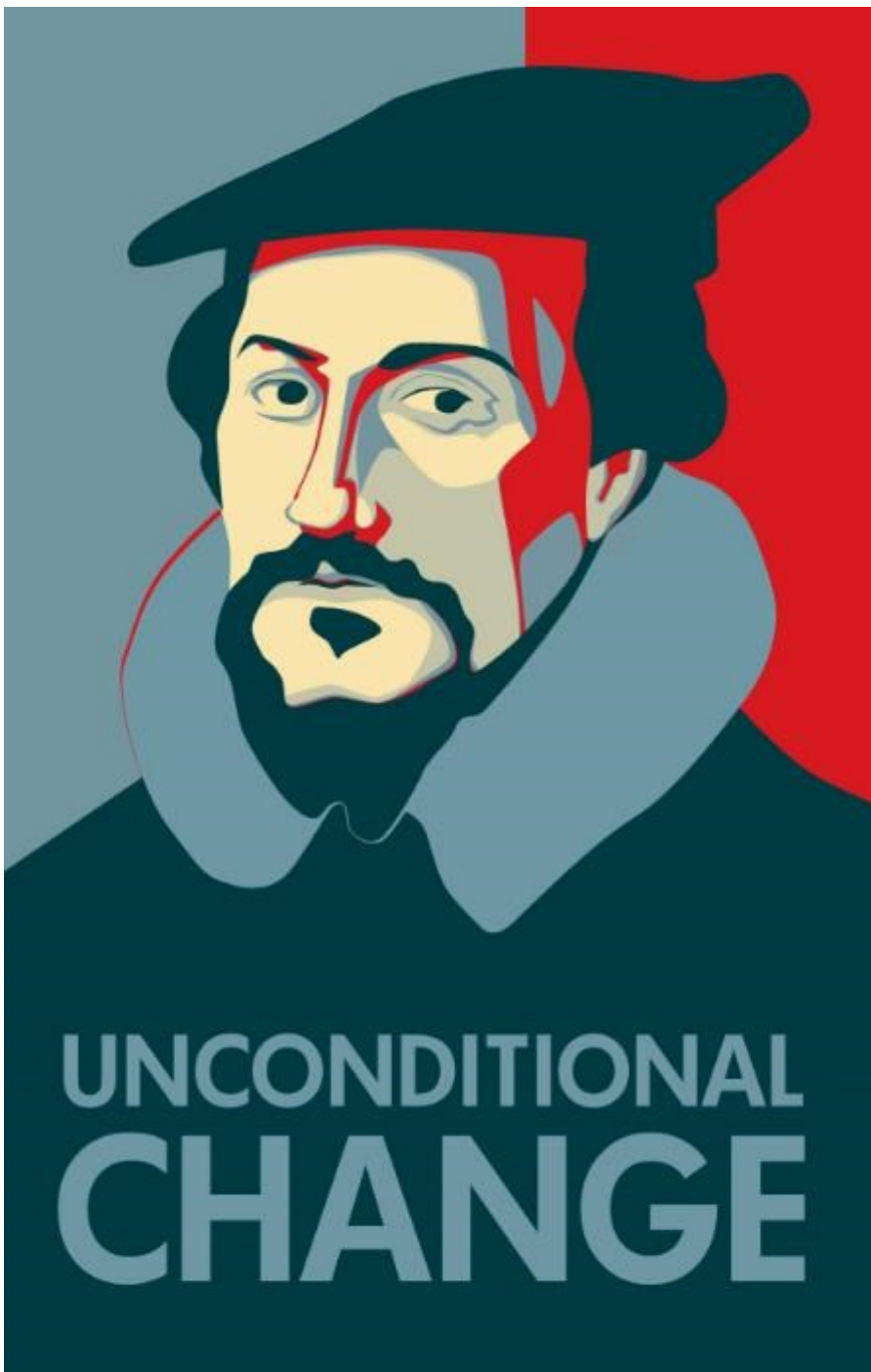


5. Noted the incomplete nature of the geological record of climate, and anticipated the day when it would be found on the sea bottom.



Fully vindicated by Challenger (1872-76) expedition - the first true oceanographic study. (Devised by Wyville Thomson Prof. of Natural History Edinburgh University)

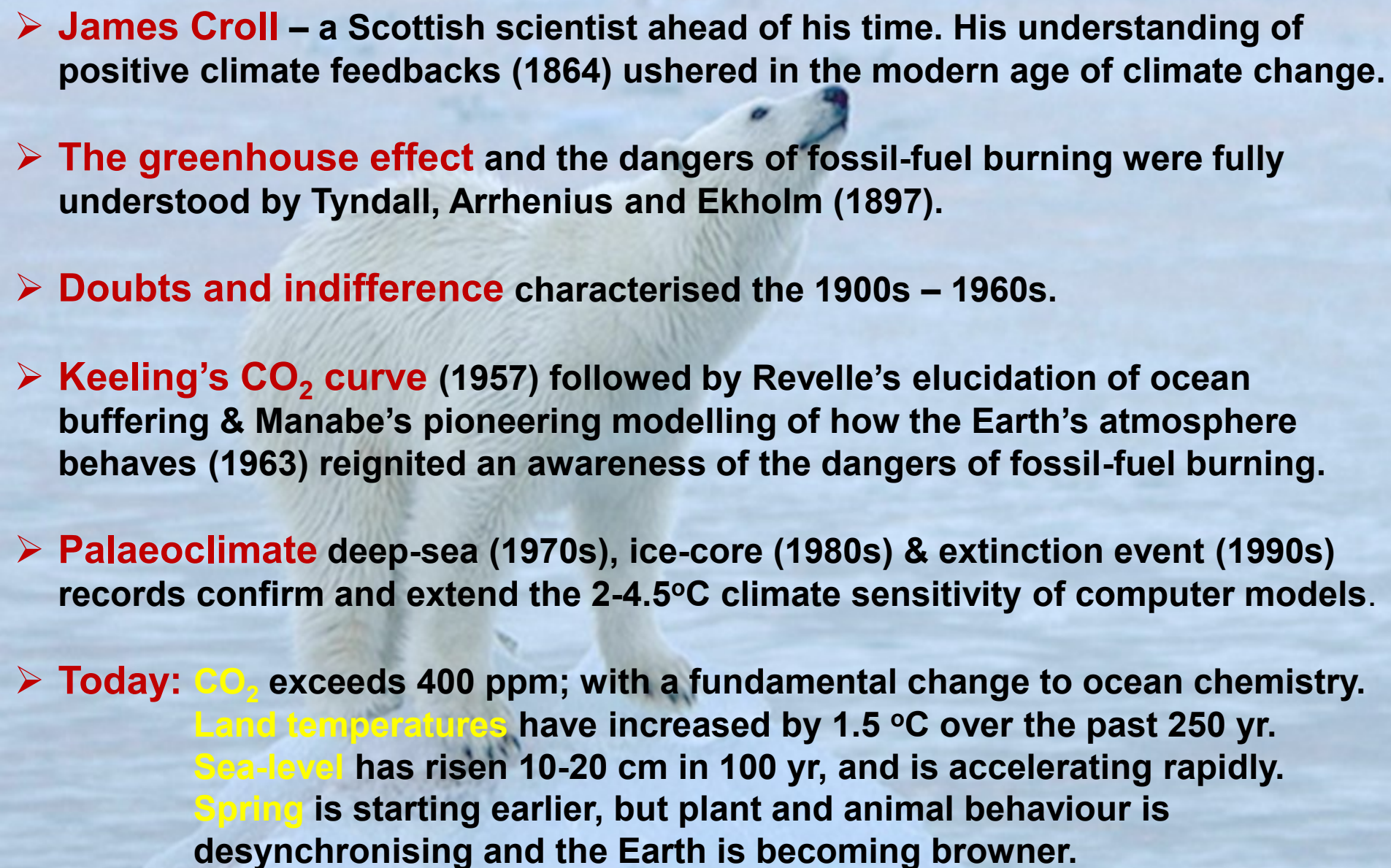




“Philosophy of Theism: An Inquiry into the Dependence of Theism on Metaphysics, and the only possible way of arriving at a proof of the existence of God.”

Croll’s metaphysical arguments were poorly received and did not prosper.

The history of climate change

- 
- **James Croll** – a Scottish scientist ahead of his time. His understanding of positive climate feedbacks (1864) ushered in the modern age of climate change.
 - **The greenhouse effect** and the dangers of fossil-fuel burning were fully understood by Tyndall, Arrhenius and Ekholm (1897).
 - **Doubts and indifference** characterised the 1900s – 1960s.
 - **Keeling's CO₂ curve** (1957) followed by Revelle's elucidation of ocean buffering & Manabe's pioneering modelling of how the Earth's atmosphere behaves (1963) reignited an awareness of the dangers of fossil-fuel burning.
 - **Palaeoclimate** deep-sea (1970s), ice-core (1980s) & extinction event (1990s) records confirm and extend the 2-4.5°C climate sensitivity of computer models.
 - **Today:** CO₂ exceeds 400 ppm; with a fundamental change to ocean chemistry. Land temperatures have increased by 1.5 °C over the past 250 yr. Sea-level has risen 10-20 cm in 100 yr, and is accelerating rapidly. Spring is starting earlier, but plant and animal behaviour is desynchronising and the Earth is becoming browner.