THE EMERGENCE OF PLATE TECTONICS
(from a back seat)

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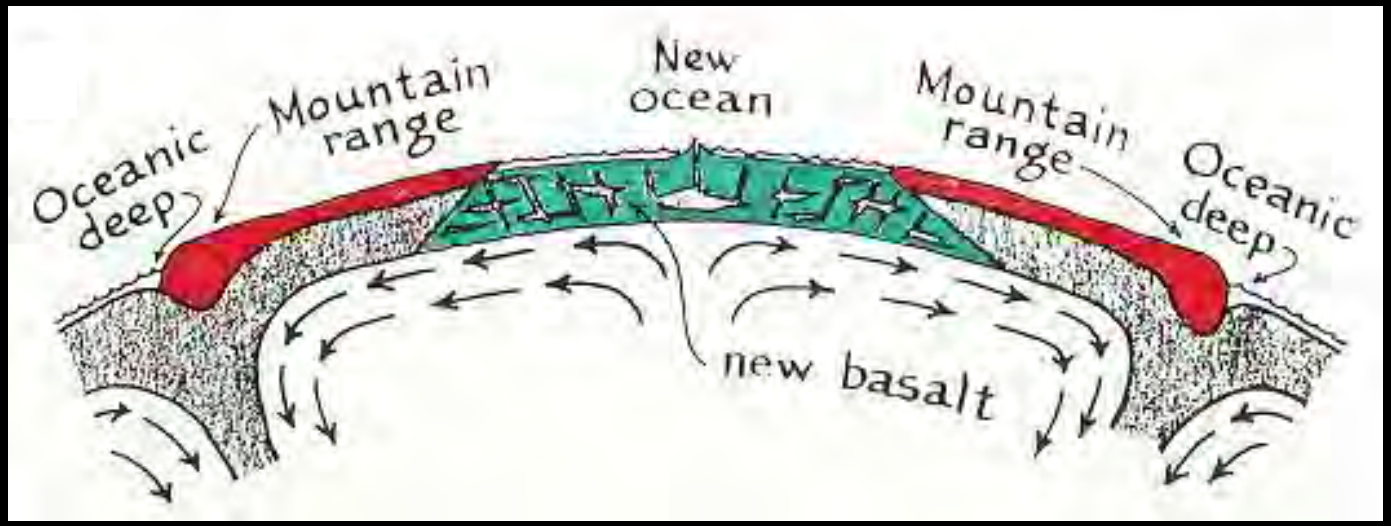
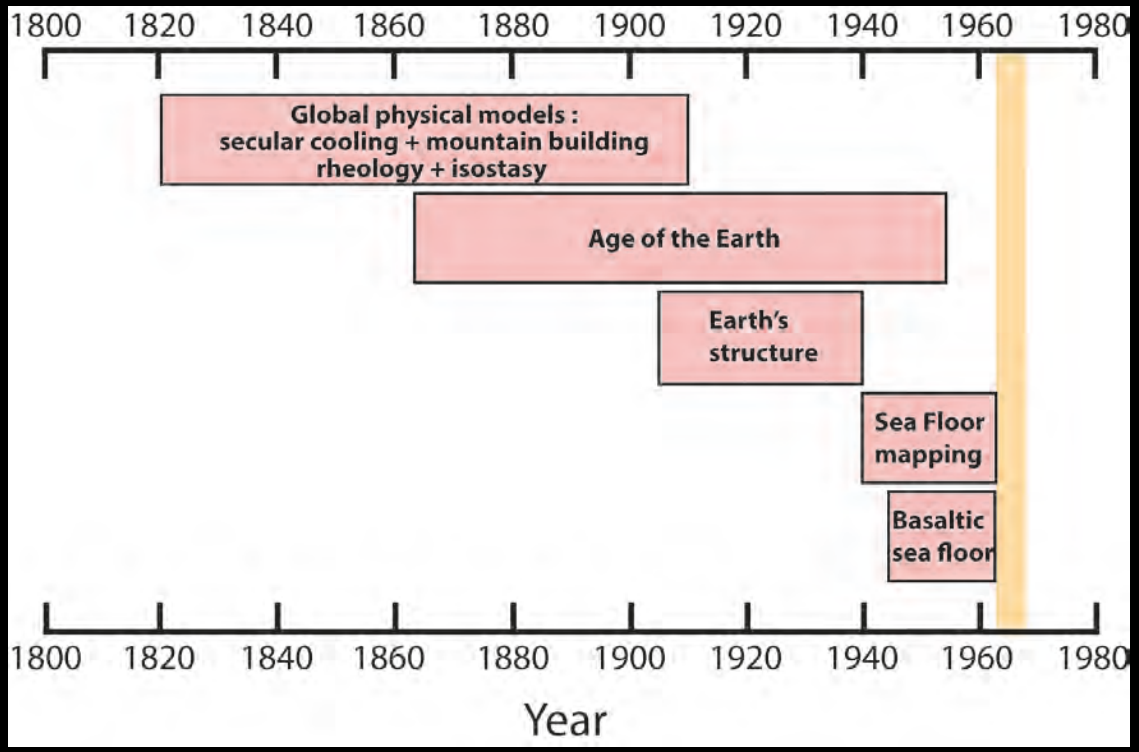


(Arthur Holmes 1944)


1800
1820
1840
1860
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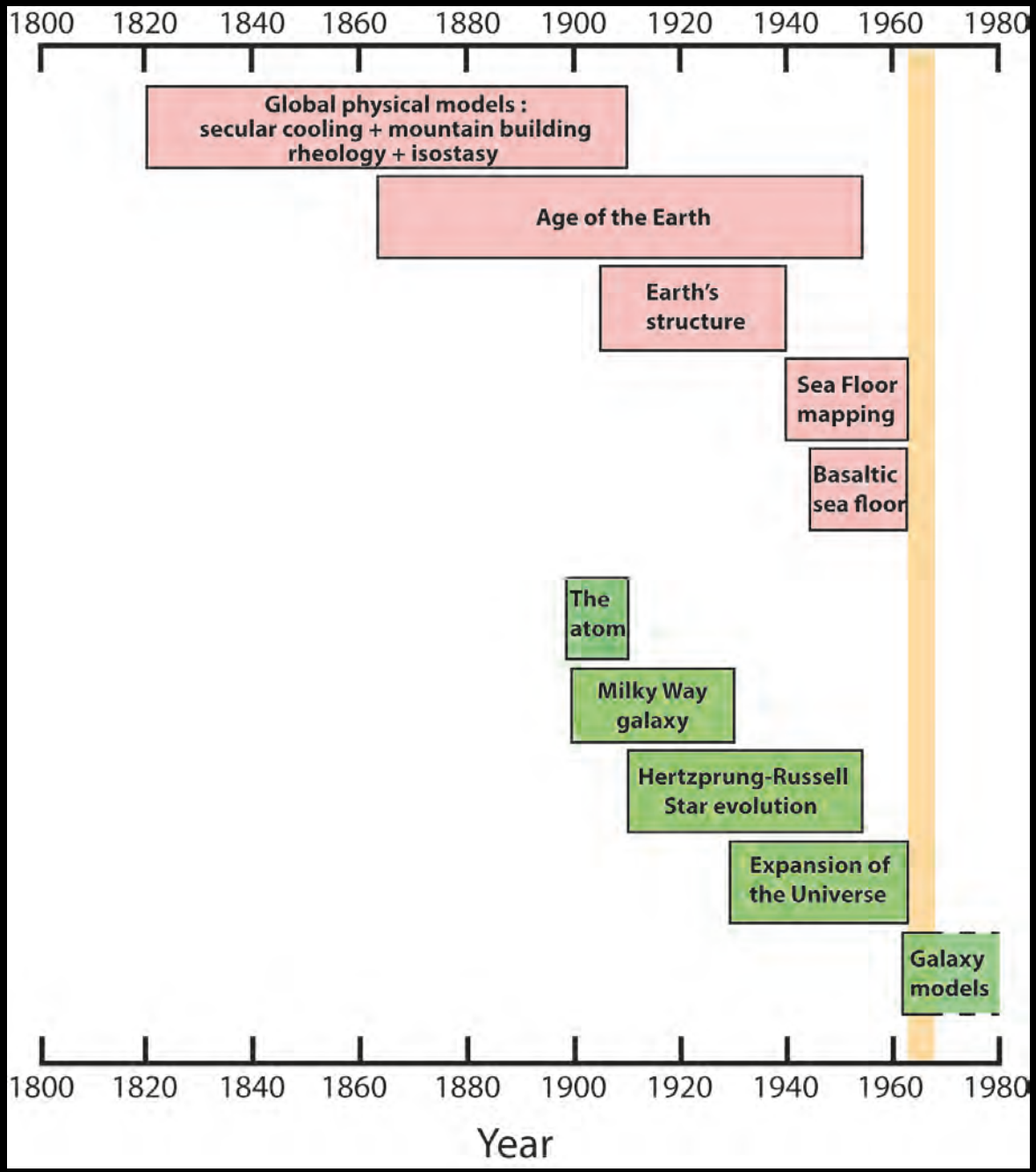
1900
1920
1940
1960
1980
Global physical models :
secular cooling + mountain building
rheology + isostasy
Age of the Earth
Earth's
structure
Sea Floor
mapping
Basaltic
sea floor
Year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Milky Way
galaxy
Hertzprung-Russell
Star evolution
Expansion of
the Universe
Galaxy
models
Year

THERMAL EVOLUTION MODELS

The very first attempts to study the Earth
as a whole and as a physical system bound to evolve.

Assumptions:

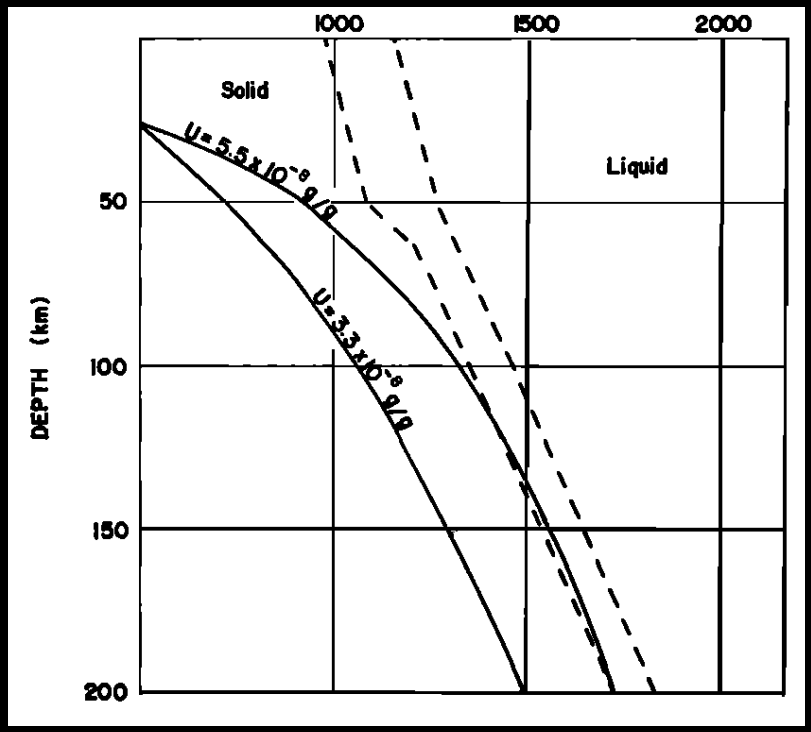
(1) Conductive heat transport
(2) Initial conditions ?
(3) Observed heat flow

(…)

(4) Radiogenic heat production

Model calculations

(1) Conductive heat transport
(2) Initial conditions ?
(3) Observed heat flow
(4) Radiogenic heat production



(McDonald, 1964)

Main constraint:
avoid melting in the mantle.

Solutions:
Initial conditions,
High thermal conductivity at depth,
Concentration of heat producing elements in a surface layer,
Convective motions.