

From François-Léopold Cornet and Alphonse Briart to Alfred Wegener and Emile Argand: from the notion of horizontal translation to the emerging plate tectonics theory

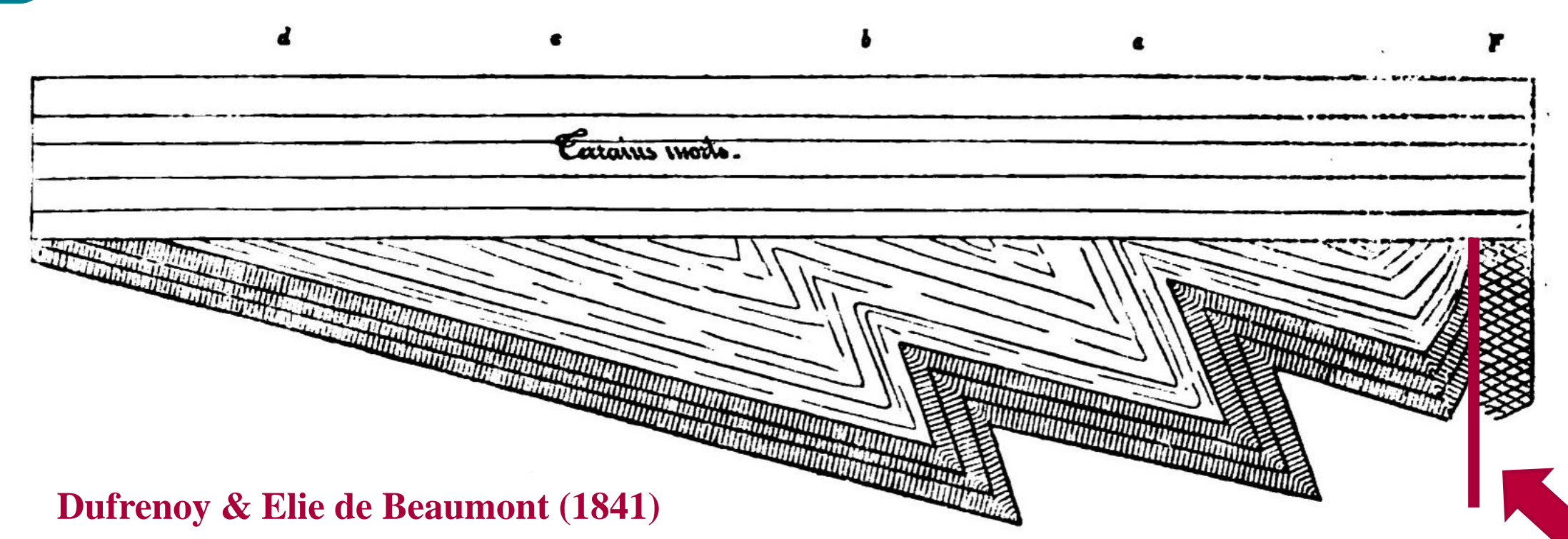
Evolution of structural geology concepts around (and from) the Midi Fault in Belgium

Back to the coal extraction during the 19th century...

- Coal extraction development
- Exploration of the Franco-Belgian coalfield

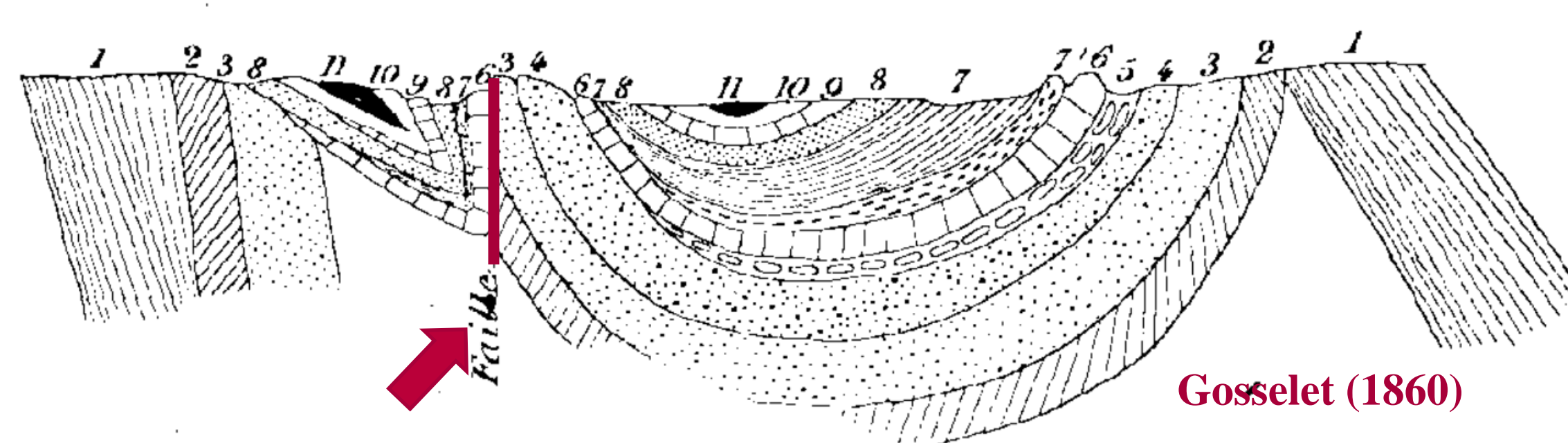
Recognition of the southern boundary of the coalfield

- In the Liège district (Dumont, 1832)
- In the French and Belgian Hainaut regions (Dufrenoy & Elie de Beaumont, 1841)



Coupe générale du terrain carbonifère des environs de Valenciennes, faite du N. au S.

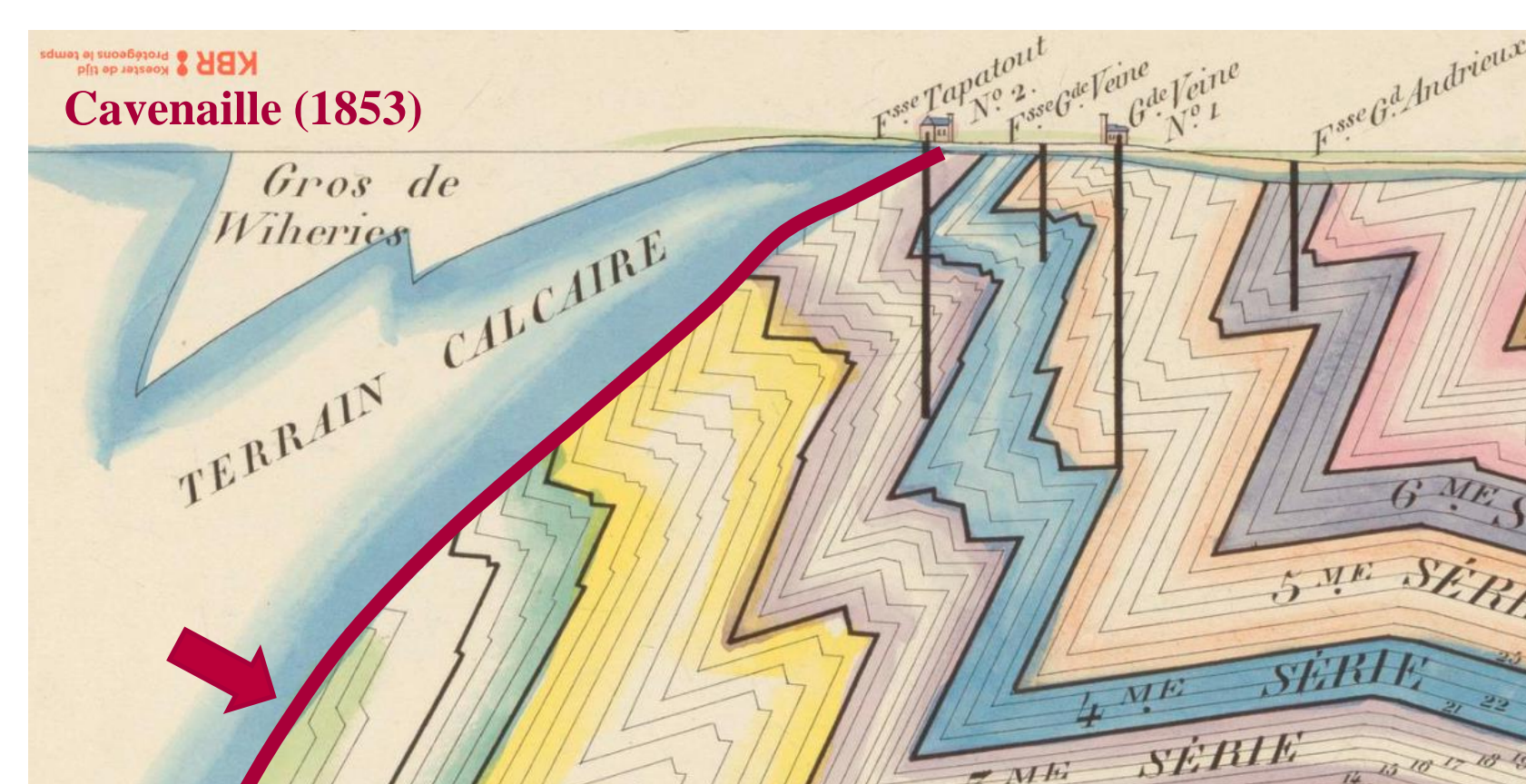
What about the nature of the southern boundary of the coal basin?



- Single major discontinuity along the southern edge of the Franco-Belgian coal basin (Godwin-Austen, 1856 ; Gosselet, 1860)
- Vertical discontinuity (Gosselet, 1860)

Different names of this boundary depending of the location

- 'Grande Faille' from Liège to Valenciennes (Gosselet, 1860)
- '(Grande) Faille du Midi' in the Hainaut (Cornet & Briart, 1863 ; 1877)
- 'Faille eifélienne' nearby Liège (Malherbe, 1863)



A vertical discontinuity ??

- In the 1830s, coal seams discovered below the Devonian formations in the Dour area, southwards the emergence of this major fault (i.e. Plumet, 1849 ; Cavenaille, 1853)
- In the 1850s, same observation in the Liège area (Cornet & Briart, 1863)

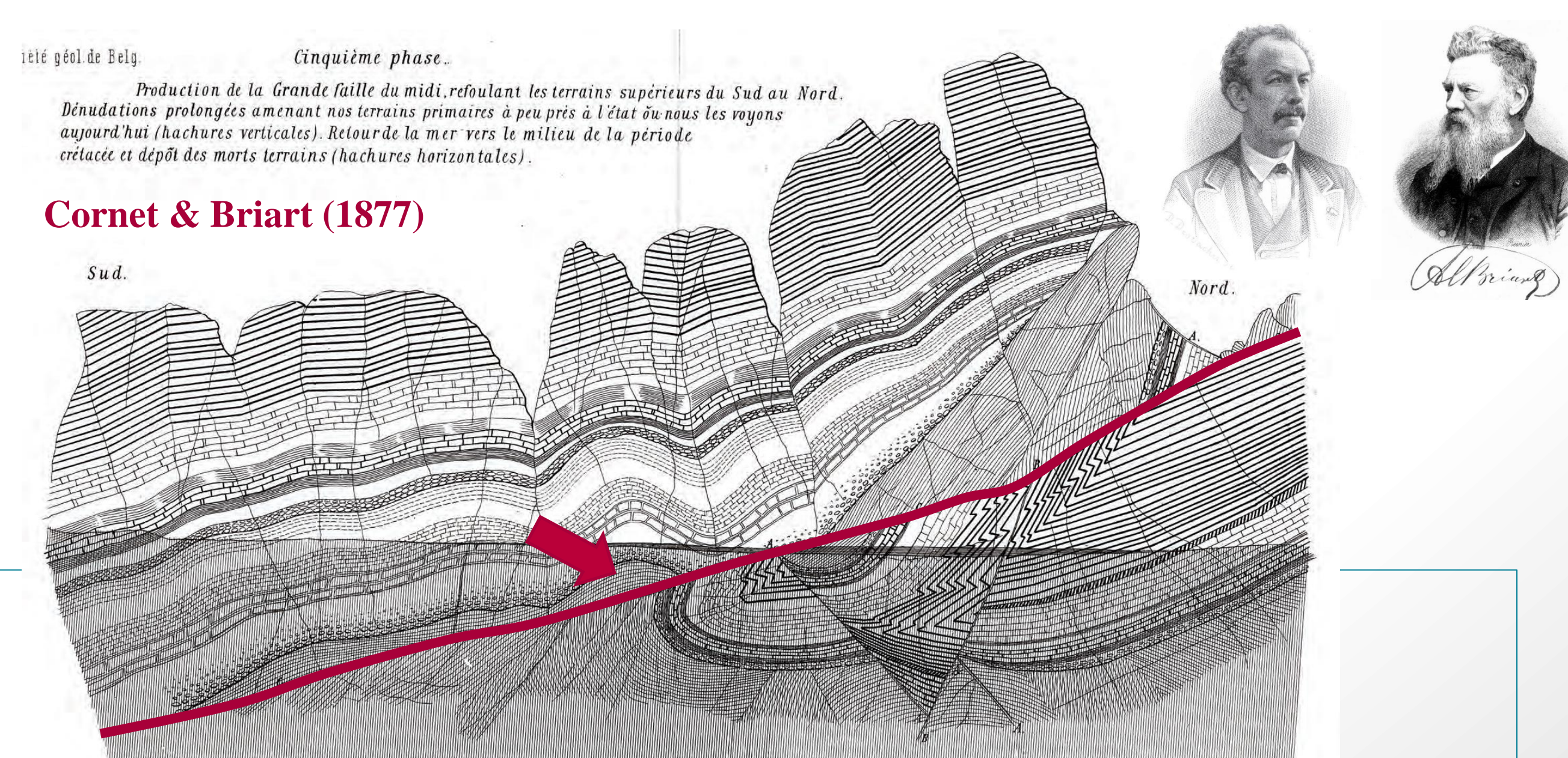
From the notion of horizontal translation to the emerging plate tectonics theory

Cornet & Briart (1863 ; 1877) : first to correctly show that this main discontinuity is a result of a horizontal translation

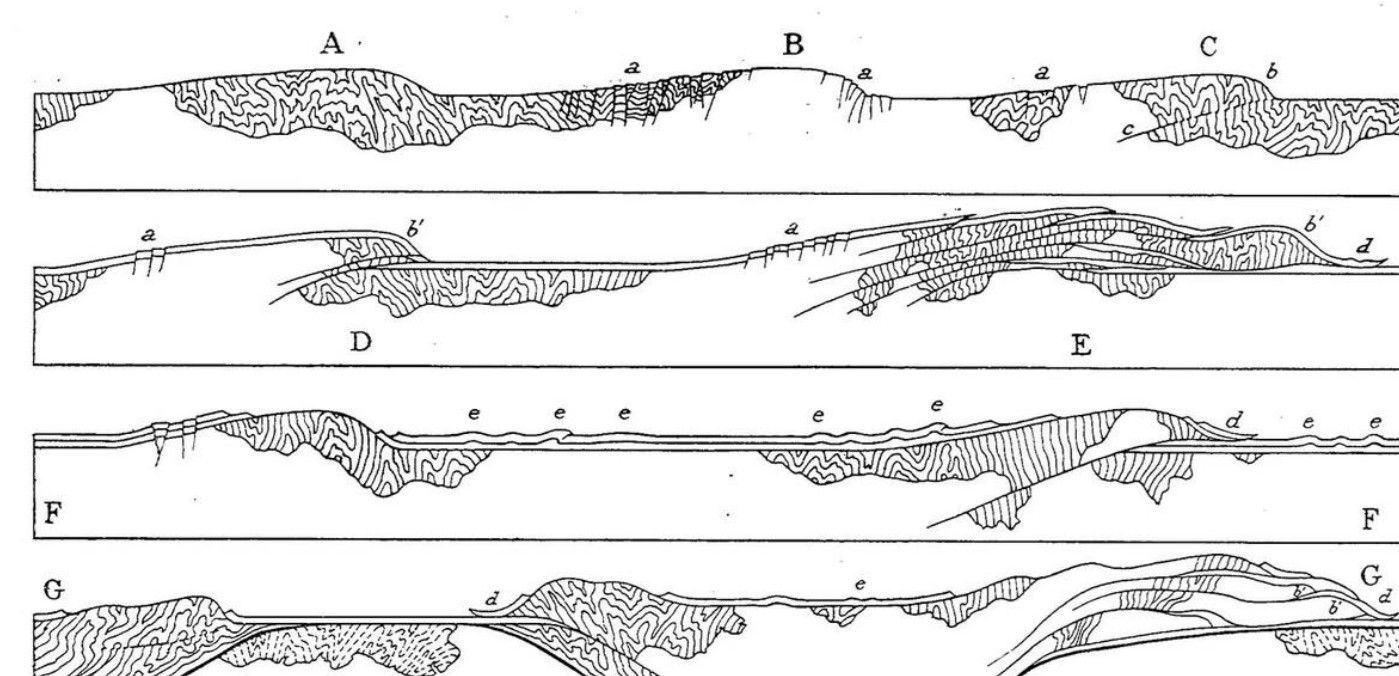
→ origin of the theory of thrust sheets explaining the formation of mountain ranges

Dissemination and application of the horizontal translation theory

- Propagation by Alpine German-speaking geologists (Suess, 1883)
- Application to the Alps formation (Rothpletz, 1883 ; Bertrand, 1884)
- contributes to make Bertrand the discoverer of the thrust sheets and eventually the founder of modern tectonics, instead Cornet & Briart...!
- Application to the NW-Scotland (Lapworth, 1883 ; 1885), to the Scandinavian Caledonides (Törnebohm, 1888 ; 1896),...



Wegener (1915)



Argand (1924)

Integration of the horizontal translation theory of Cornet & Briart as a key element of the Wegener's continental drift theory :

- Wegener (1912 ; 1915) used the application of thrust sheets theory in the Alps to support its disrupting continental drift theory
- 100 years ago, following the International Geological Congress in Liège (1922): Argand (1924) used the Wegener's theory to propose that the origin of the thrust sheets is the result of the collision of drifting continents