

a20 Unconformities interpreted by Steno < infill >

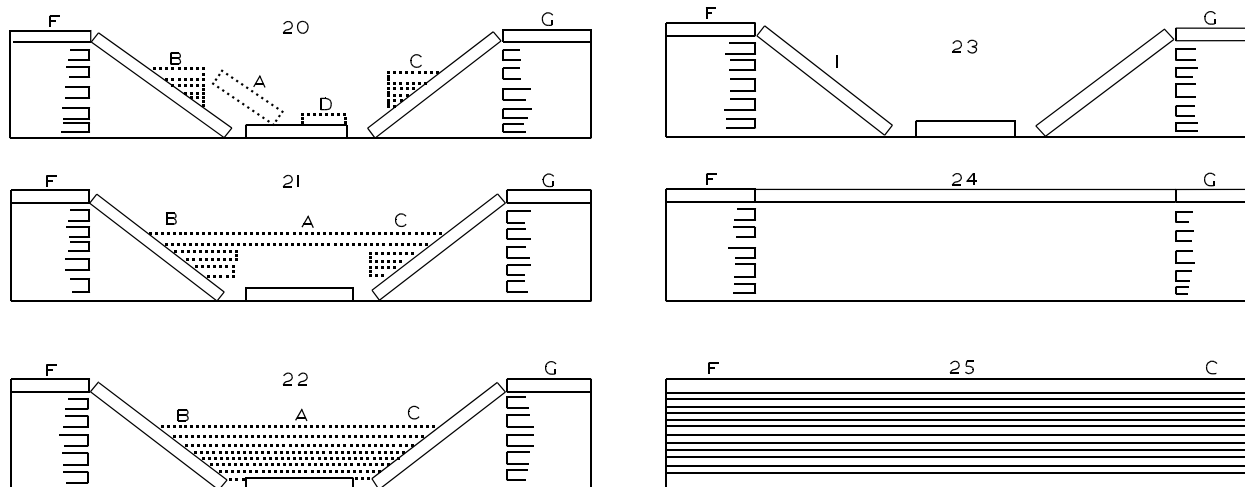
I do misrepresent things. I don't tell the truth. I tell what ought to be truth. —Blanche DuBois (Vivien Leigh) to Mitch (Karl Malden) in the 1951 film version of Tennessee Williams' 1947 play *A Streetcar Named Desire*.¹

Steno found evidence of interruptions, similar to the formation of karst sinkholes, in the ongoing accumulation of sedimentary strata in the area of Tuscany, Italy. Horizontal strata accumulate as valley-floor alluvial infill. The valley sides expose inclined strata that Steno could assume had collapsed where they had once roofed over caverns. The collapsed strata can be restored to its former position using principles of original horizontality and of lateral continuity (**Figure a20.1**). The caverns originate by dissolution of rock layers formerly present. His inferences in the forgoing bolstered the (false) principle that high elevations in the scenery are primordial. True was his method to learn “in what way the present condition of anything discloses the past condition of the same thing.”² Steno then sought to further verify his discovered geological history of the world in frank discussions with other scholars during geologizing travels beginning in October, 1668, southward from Florence to Rome, across the Apennines and along the Adriatic coast to Venice, and thence to Bologna. Simplicity in geology is not there, and a disillusioned Steno in 1671 confides in a letter to a friend that “we actually know nothing about the origins or original structures of natural objects.”³ □

Figure a20.1² Steno's schema in 1669 for showing, in retrospect, tectonic evolution

Strata B, A, D, and C, composed of weakly consolidated (shown in stippled outline) sediments with remains of marine animals in section 20 can be restored (principle of horizontality) to BAC in section 21. BAC is horizontal and below it is a restored cavern. Horizontal strata to either side of this cavern were formerly continuous (principle of lateral continuity) as is shown in section 22. These “post-Deluge” strata stop in their lateral continuity where in their accumulation they filled against older inclined strata composed of strongly consolidated (shown in solid outline) azoic (without life) sediments. Their bottom layer had filled across an irregular floor. The prior empty basin is shown in section 23.

A similar sequence of events can be reasoned to have occurred once before. Stratum I and its various identified pieces shown in section 23 are collapsed (principle of original horizontality) and fallen. These “pre-Deluge” azoic strata can be restored to their former position (principle of lateral continuity) as is shown in section 24. The pieces bridge horizontally between F and G and a cavern below is restored. Horizontal strata to either side of the cavern were formerly continuous (principle of lateral continuity) as is shown in section 25. These Steno presumed, there being nothing to block their spread originally, had filled across the entire world and, hence, are primordial.



Note: Basin-fill strata cut off against (and so are younger than) older strata that form the basin. This type of butress unconformity was *imagined* by Hutton to be more common than is now known for it, and it was *not* the type of angular unconformity that he did find and explain (see Topic a22).