JEOLOJİK ZAMAN

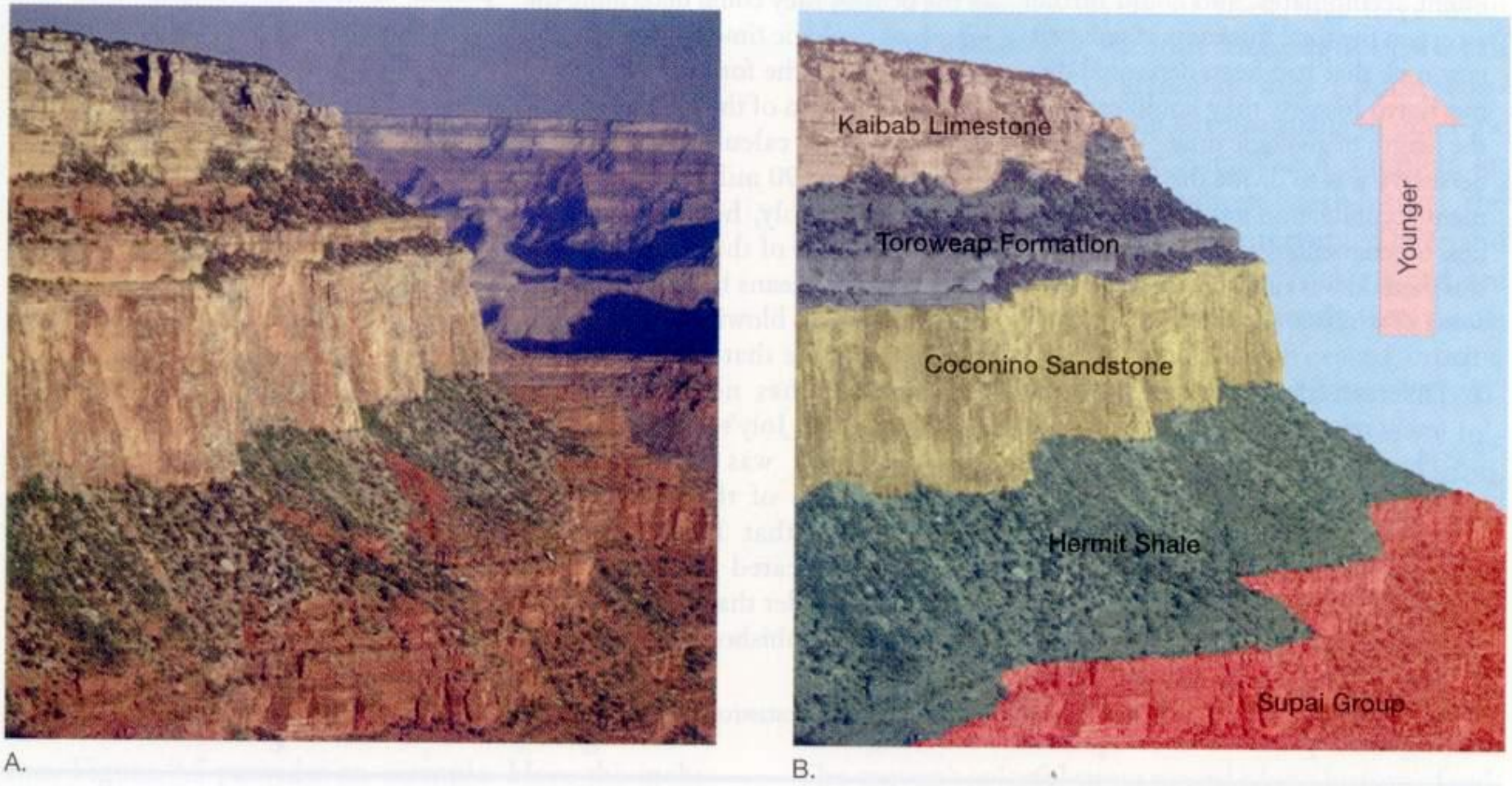


Figure 8.2 Applying the law of superposition to these layers exposed in the upper portion of the Grand Canyon, the Supai Group is oldest and the Kaibab Limestone is youngest (Photo by E. J. Tarbuck)

Figure 8.3 Most layers of sediment are deposited in a nearly horizontal position. Thus, when we see rock layers that are inclined, we can assume that they must have been moved into that position by crustal disturbances after their deposition. Hartland Quay, Devon, England. (Photo by Tom Bean/DRK Photo)

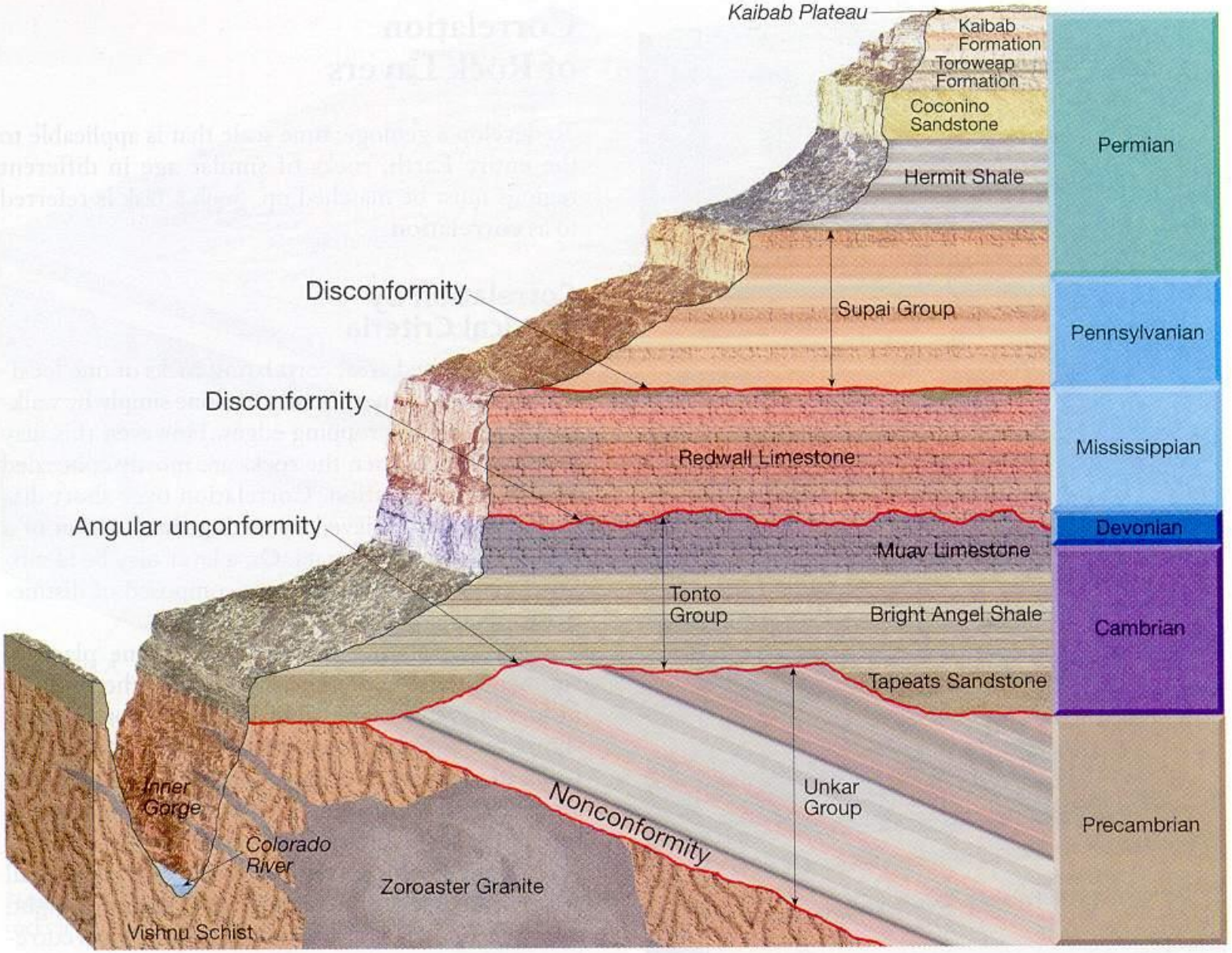
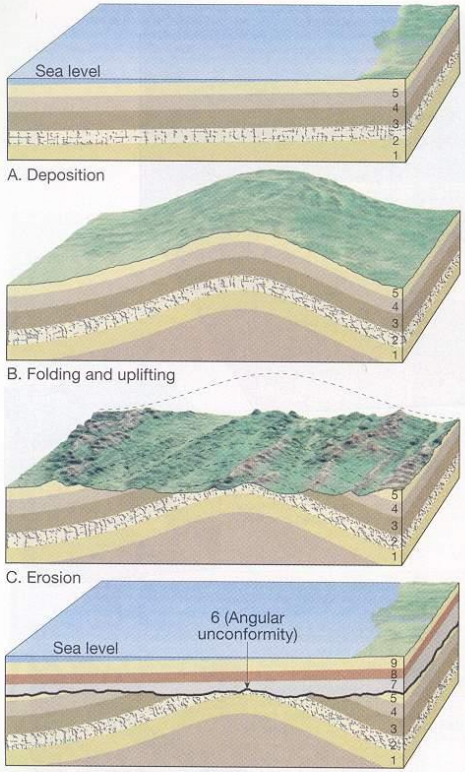
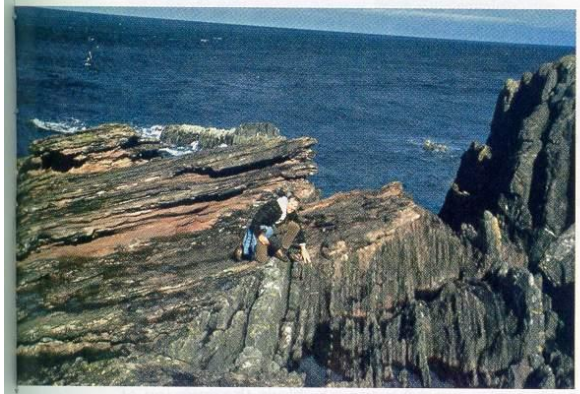


Figure 8.6 This cross-section through the Grand Canyon illustrates the three basic types of unconformities. An angular unconformity can be seen between the tilted Precambrian Unkar Group and the Cambrian Tapeats Sandstone. Two disconformities are marked, above and below the Redwall Limestone. A nonconformity occurs between the igneous and metamorphic rocks of the Inner Gorge and the sedimentary strata of the Unkar Group.





E.

Figure 8.7 Formation of an angular unconformity. An angular unconformity represents an extended period during which deformation and erosion occurred. Part E shows an angular unconformity at Siccar Point, Scotland that was first described by James Hutton and John Playfair more than 200 years ago. (Photo by Edward Hay)

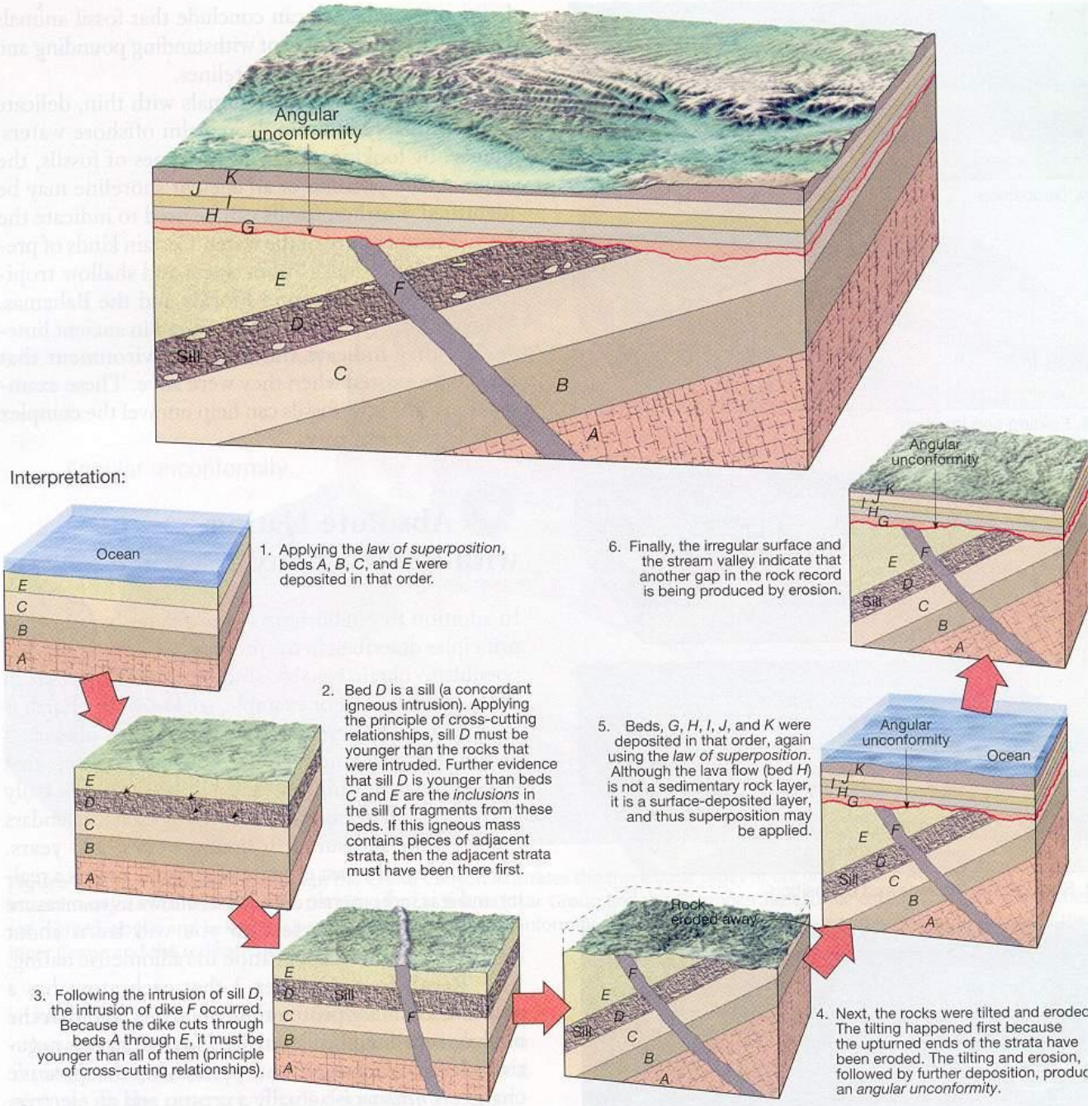


Figure 8.8 Geologic cross-section of a hypothetical region.

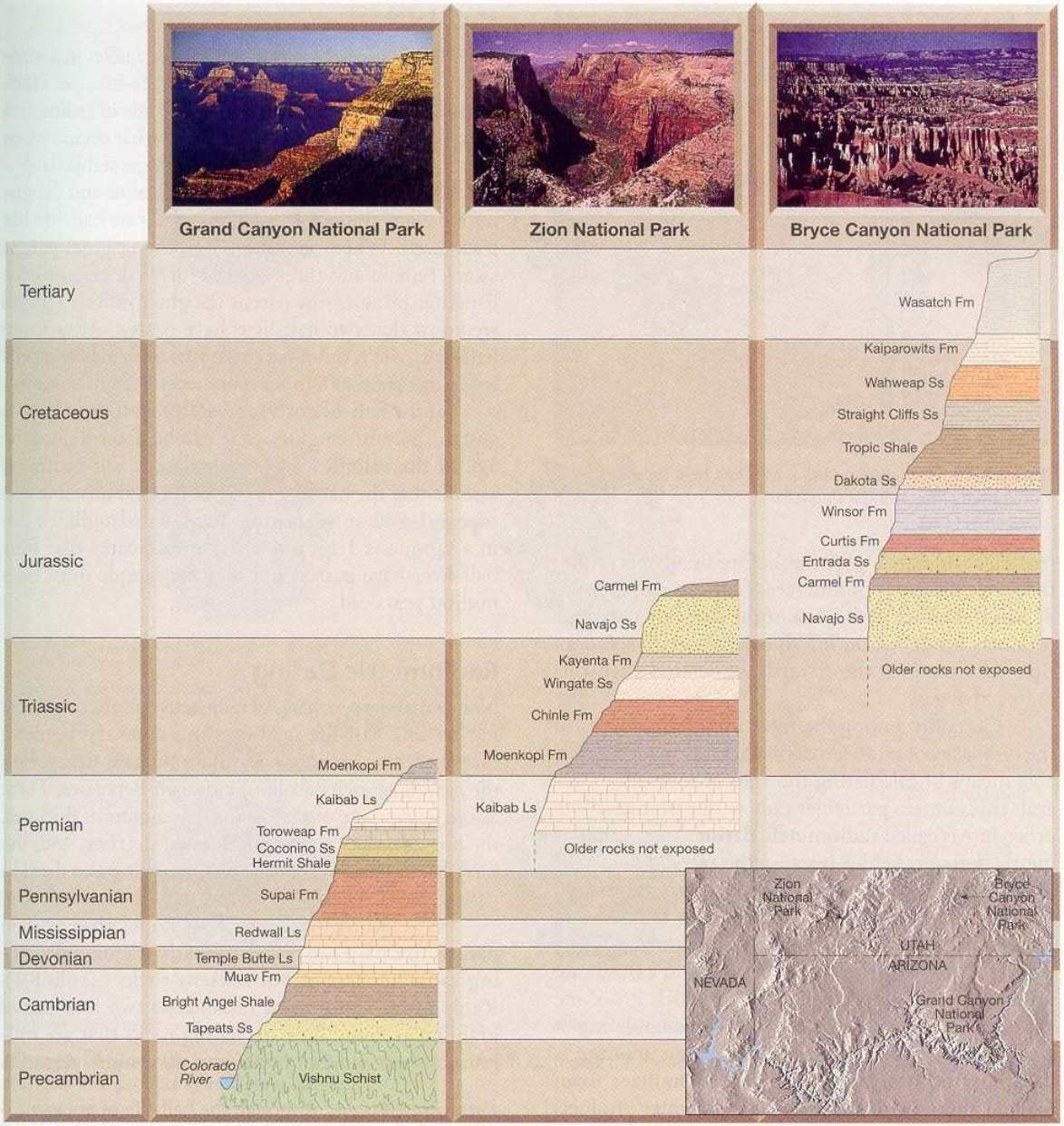


Figure 8.9 Correlation of strata at three locations on the Colorado Plateau reveals the total extent of sedimentary rocks in the region. (After U.S. Geological Survey; Photos by E. J. Tarbuck)

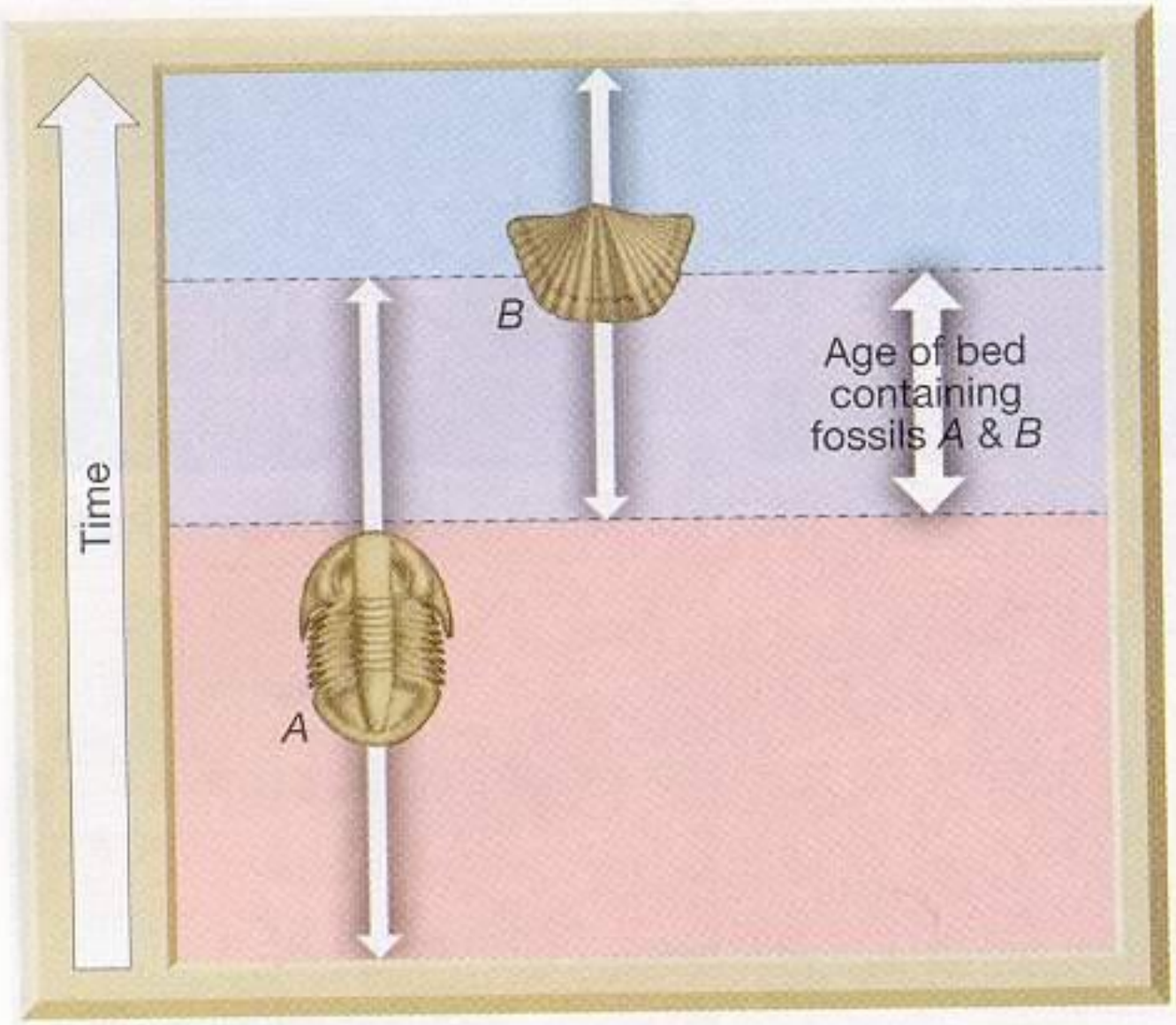
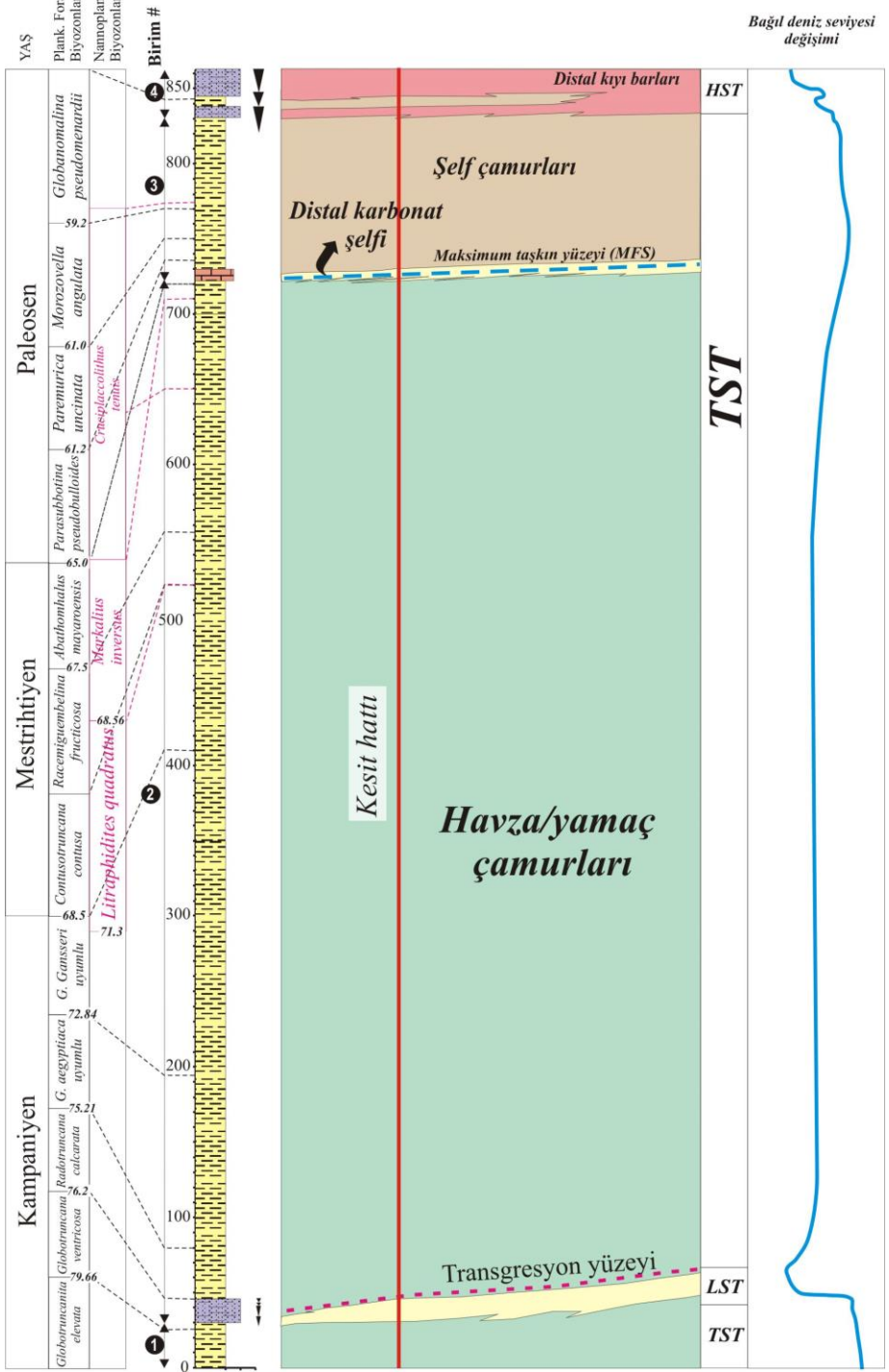


Figure 8.10 Overlapping ranges of fossils help date rocks more exactly than using a single fossil.


YAŞ
Plank. Foram Biyozonları
Nannoplank. Biyozonları
Birim #
Bağıl deniz seviyesi değişimi
Paleosen
Mestrihtiyen
Kampaniyen
Globanomalina pseudomenardii
Morozovella angulata
Paremurica uncinata
Parasubbotina pseudobulloides
Abathomphalus mayaroensis
Racemiguembelina fructicosa
Contusotruncana contusa
G. Gansseri uyumlu
G. aegyptiaca uyumlu
Radotruncana calcarata
Globotruncana ventricosa
Globotruncanita elevata
59.2
61.0
61.2
65.0
67.5
68.56
68.5
71.3
72.84
75.21
76.2
79.66
Cruciplacolithus tenuis
Markalius inversus
Litraphidites quadratus
850
800
700
600
500
400
300
200
100
0
Distal kıyı barları
HST
Şelf çamurları
Distal karbonat şelfi
Maksimum taşkın yüzeyi (MFS)
TST
Kesit hattı
Havza/yamaç çamurları
Transgresyon yüzeyi
LST
TST

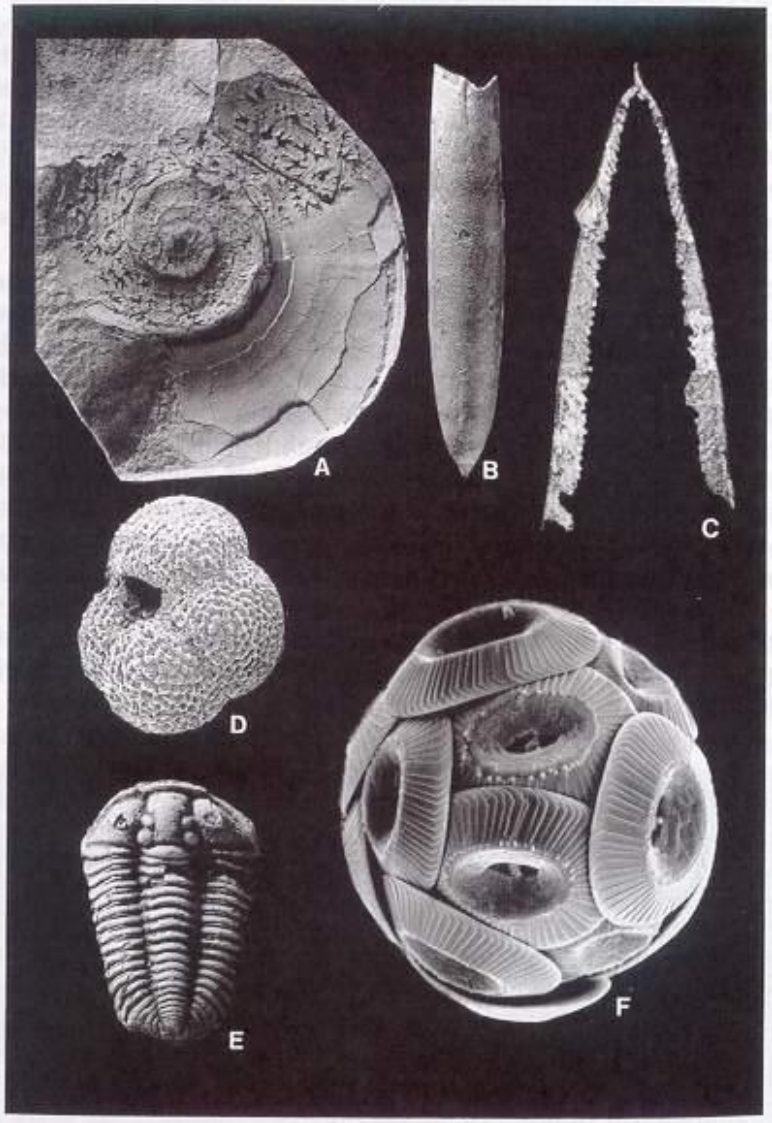


Figure 4.2 *Photographs of a selection of guide fossils.* ***A:*** *Ammonite* (Lytoceras) *from the Upper Jurassic of Antarctica—actual diameter 75 mm [Photograph: P. Doyle].* ***B:*** *Belemnite* (Gonioteuthis) *from the Upper Cretaceous of southern England—actual length 75 mm [Photograph: P. Doyle].* ***C:*** *Graptolite* (Didymograptus) *from the Ordovician of South Wales—actual length 35 mm [Photograph: R. Fortey].* ***D:*** *Foraminiferan* (Neogloboquadrina) *from the Holocene of the South Atlantic—actual diameter 225 μm [Photograph: F. L. Lowry].* ***E:*** *Trilobite* (Calymene) *from the Silurian of England—actual length 49 mm [Photograph: R. Fortey].* ***F:*** *Coccosphere* (Coccolithus), *composed of individual coccoliths from the present-day North Atlantic—each coccolith is 10 μm in diameter [Photograph: J. Young]*

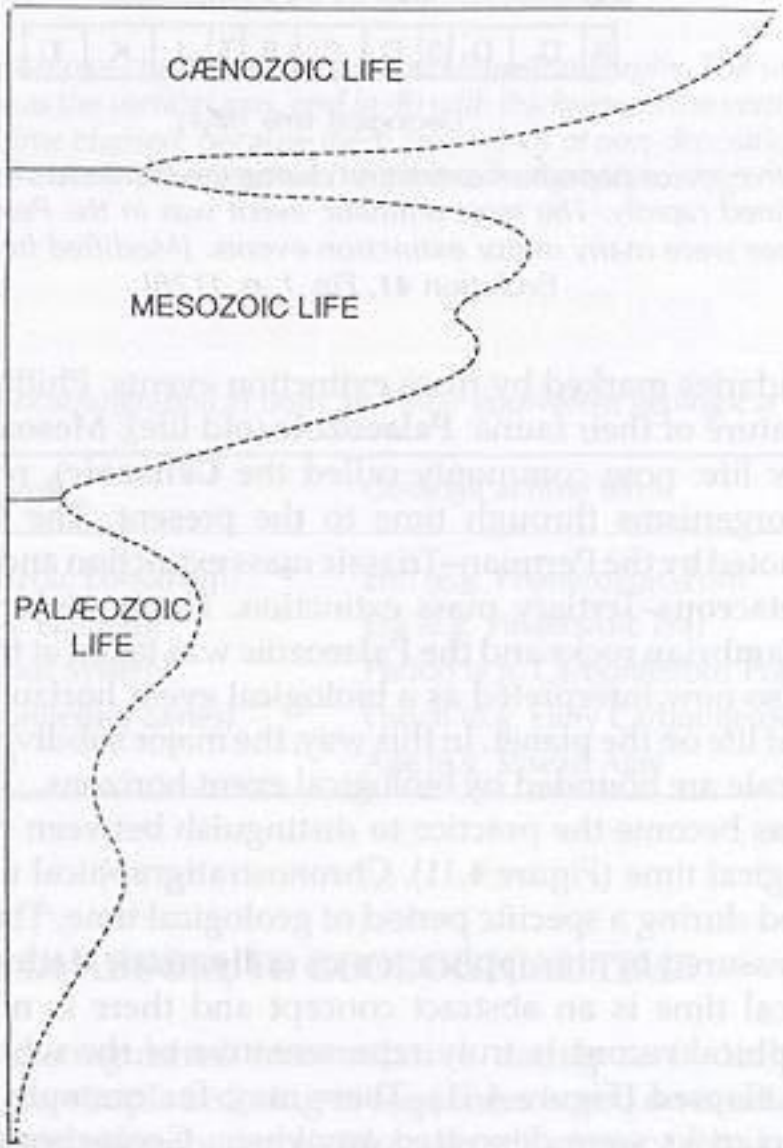


Figure 4.9 *Phillips' erathems, based on faunal diversity. The area to the left of the dashed line represents the diversity of life; the boundaries of the erathems are drawn at intervals of major falls in diversity of life. [From: Phillips (1860)* Life on the Earth: Its Origin and Succession, *Fig. 4, p. 56. Reproduced by permission of the Natural History Museum, London]*

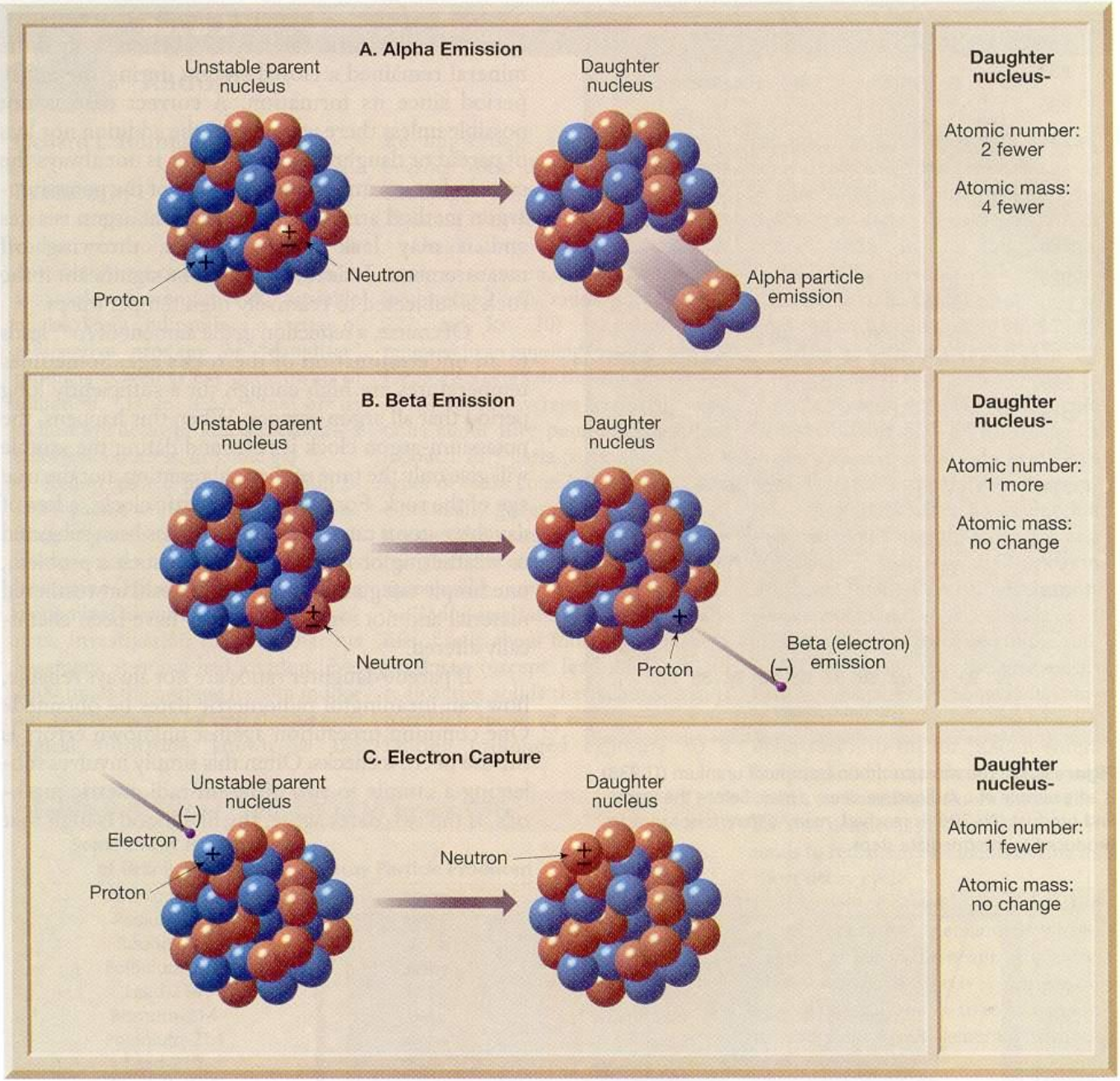


Figure 8.11 Common types of radioactive decay. Notice that in each case the number of protons (atomic number) in the nucleus changes, thus producing a different element.

Table 4.2 *A selection of radioactive reactions used in dating the geological record*

Parent: starting point	Daughter: product	Half-life (million years)
^{14}Carbon	^{14}Nitrogen	0.005 73
^{87}Rubidium	^{87}Strontium	48 000
^{40}Potassium	^{40}Argon	11 930
^{232}Thorium	^{208}Lead	14 000
^{235}Uranium	^{207}Lead	704
^{238}Uranium	^{206}Lead	4 469
^{147}Samarium	^{143}Neodymium	106 000

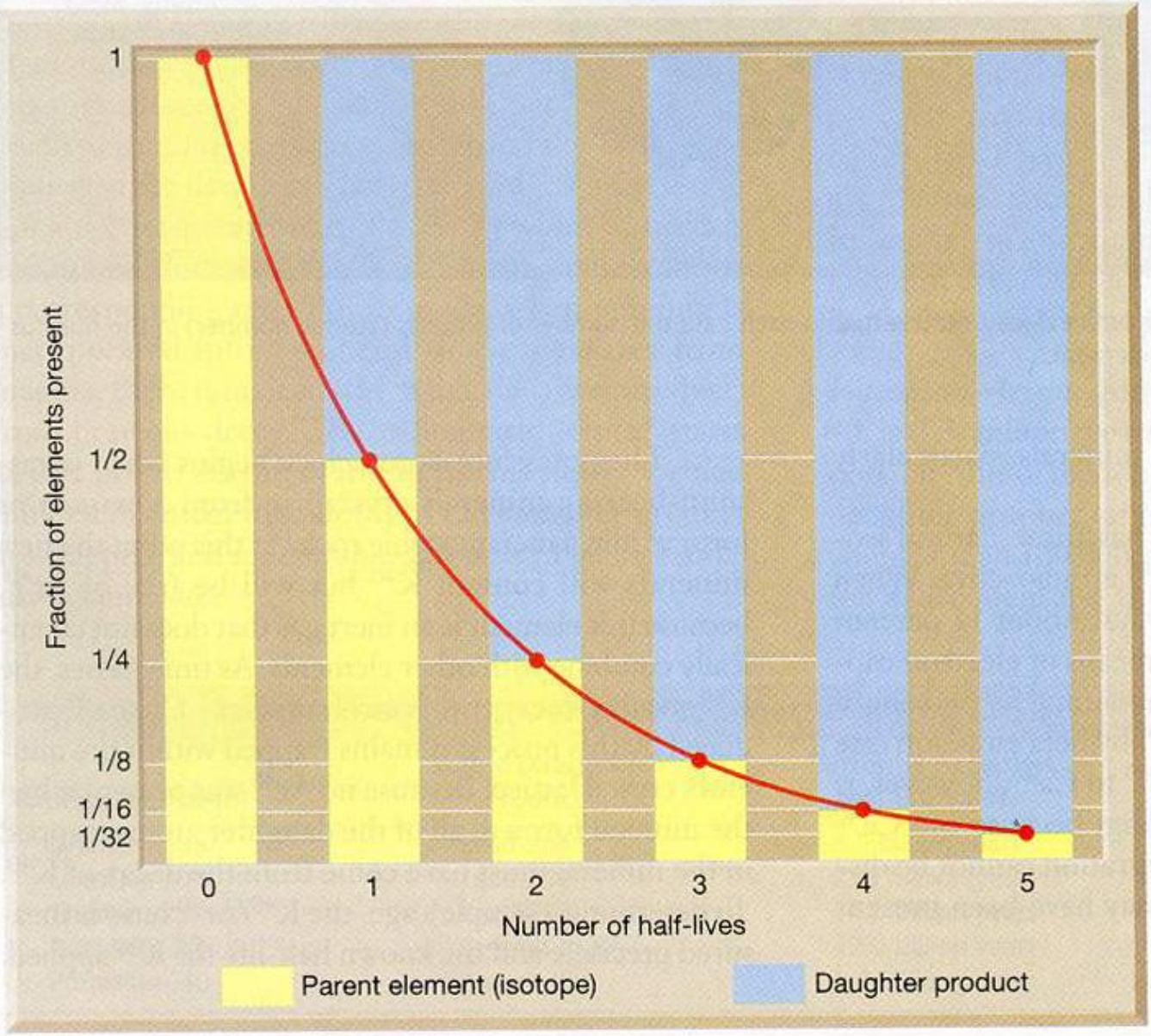


Figure 8.13 The radioactive decay curve shows change that exponential. Half of the radioactive parent remains after one half-life. After a second half-life one-quarter of the parent remains, and so forth.

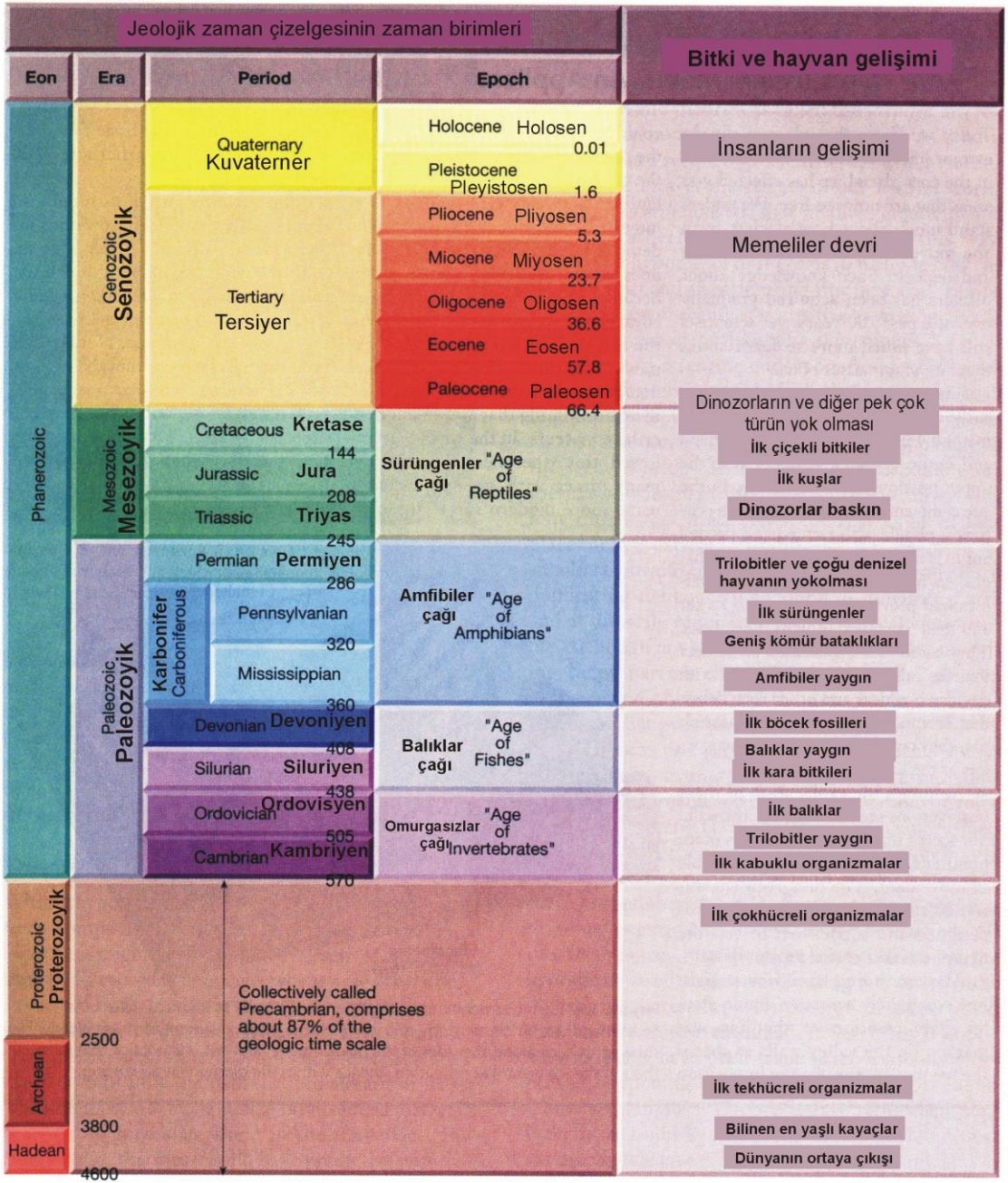


Figure 1.7 The geologic time scale. Numbers on the time scale represent time in millions of years before the present. These dates were added long after the time scale had been established using relative dating techniques. The Precambrian accounts for more than 85 percent of geologic time. (Data from Geological Society of America)