

Chapter 6

Weathering and Soils



Copyright © 2005 Pearson Prentice Hall, Inc.

Soils: a history of weathering and erosion of rocks

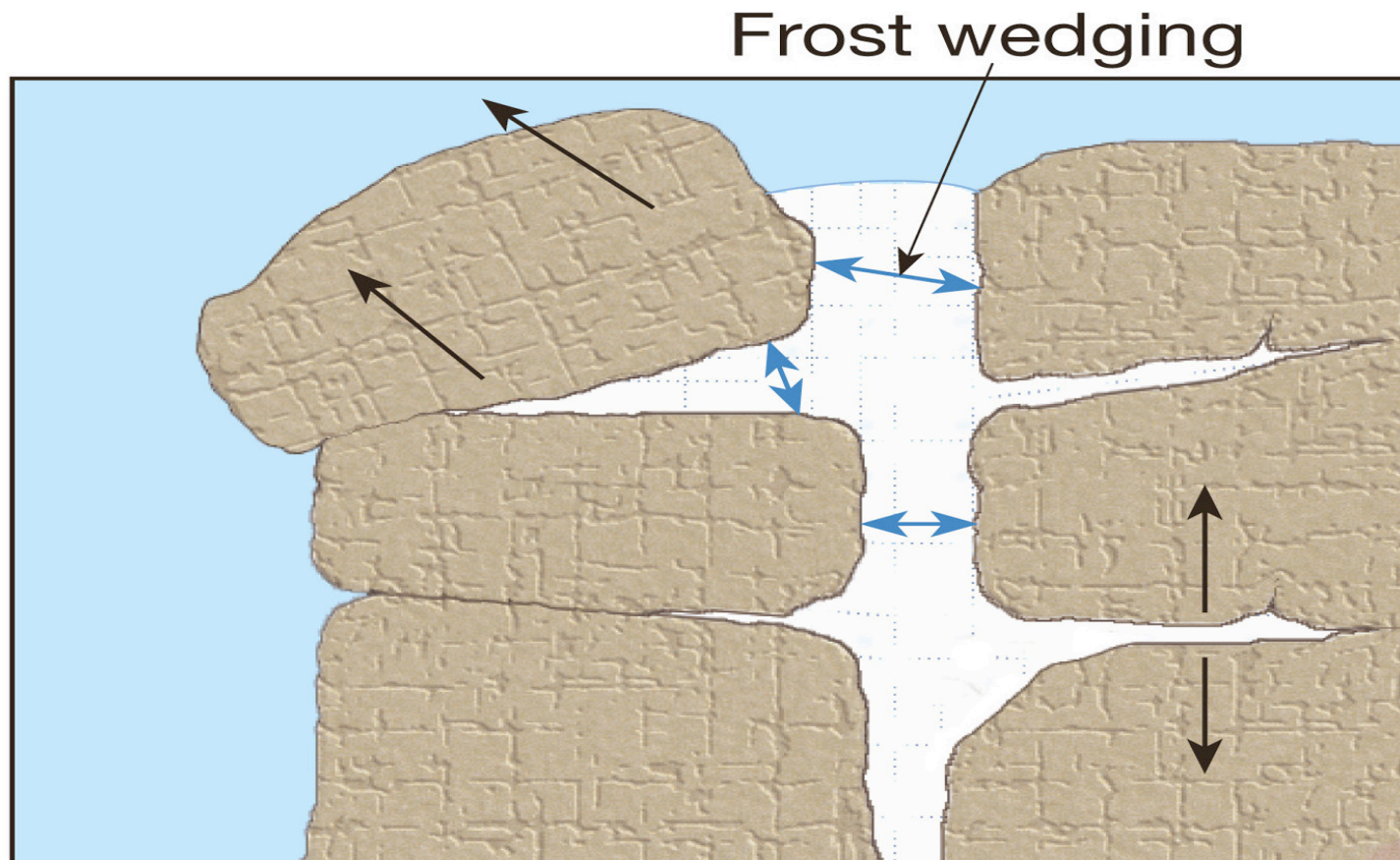


B.

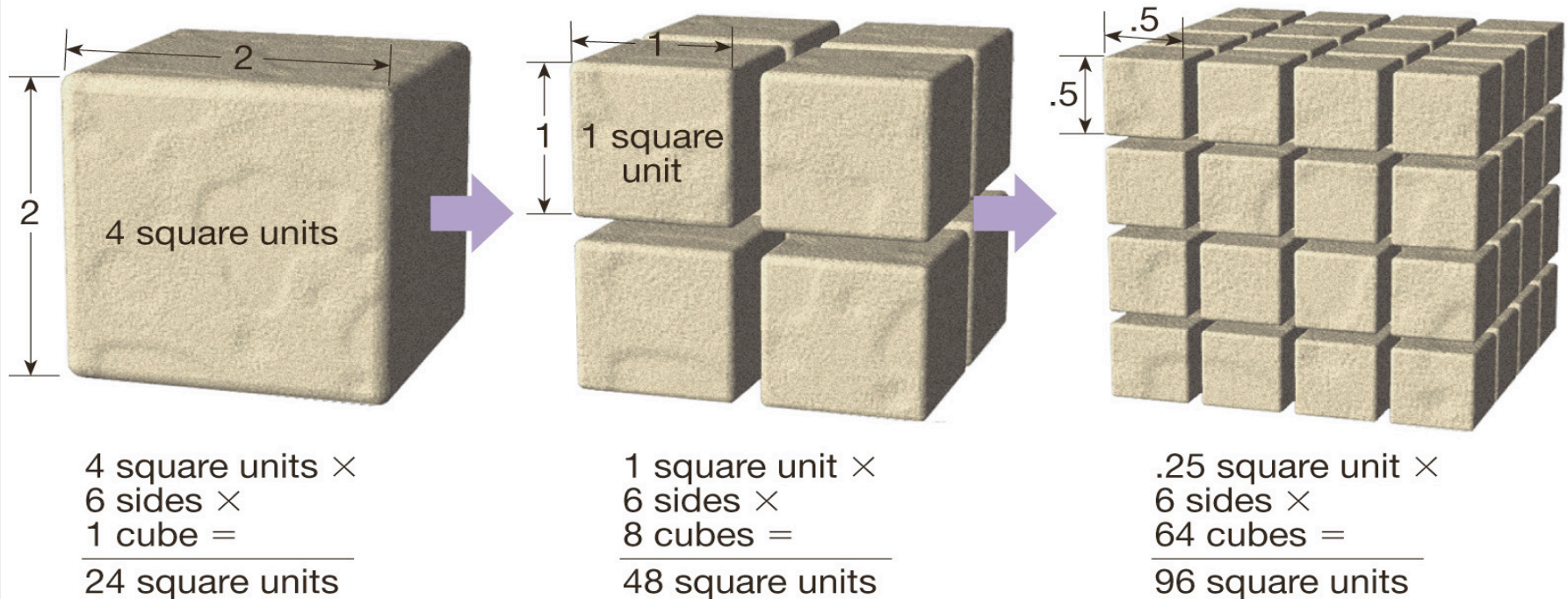
Weathering

- **Two types**

- **Mechanical weathering**



Increase in surface area



Copyright © 2005 Pearson Prentice Hall, Inc.

Figure 6.2

Physical Weathering



D.

Copyright © 2005 Pearson Prentice Hall, Inc.



Weathering

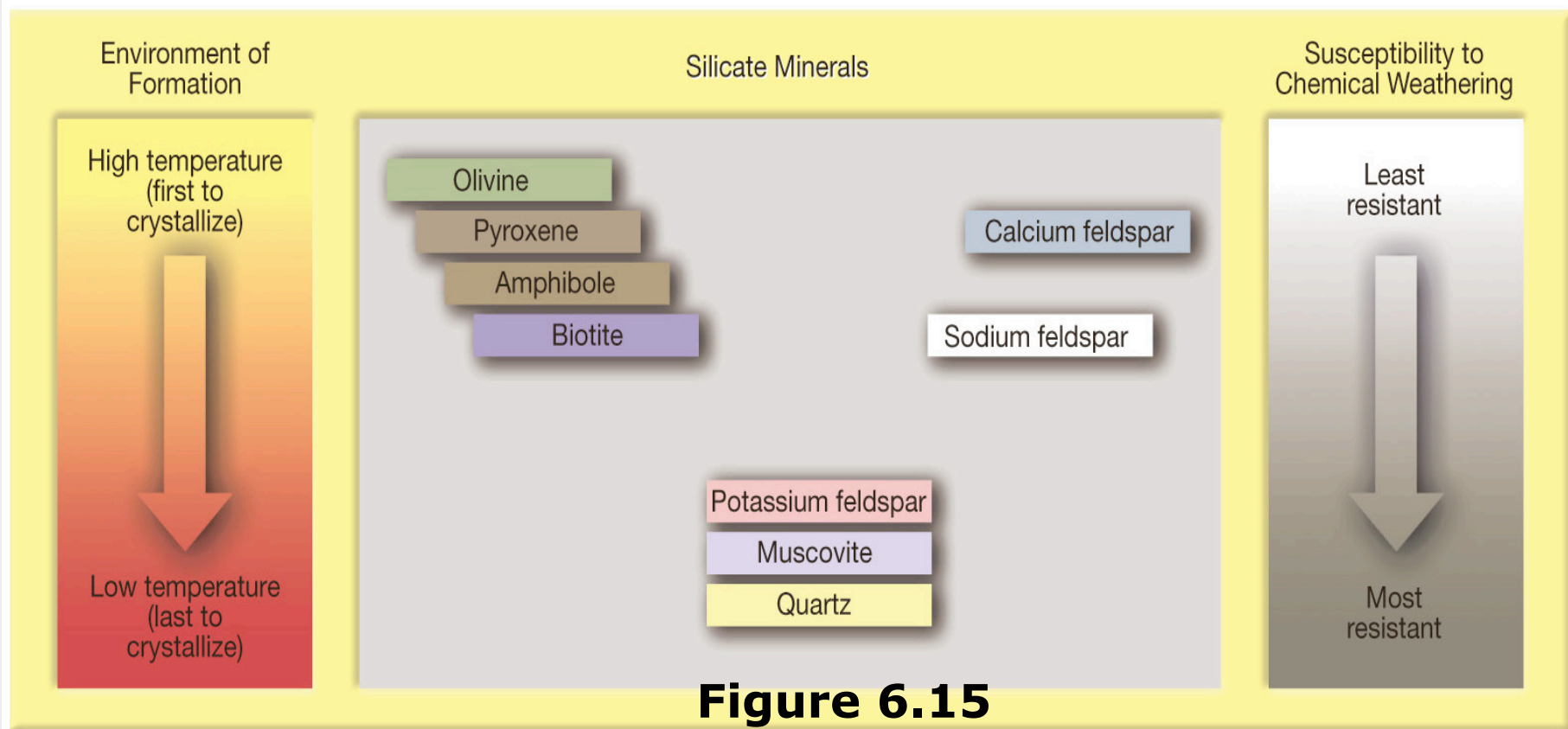
■ **Chemical weathering**

- **Oxidation**
- **Leaching**
- **Hydrolysis**



Copyright © 2005 Pearson Prentice Hall, Inc.

Weathering of common silicate minerals



Copyright © 2005 Pearson Prentice Hall, Inc.

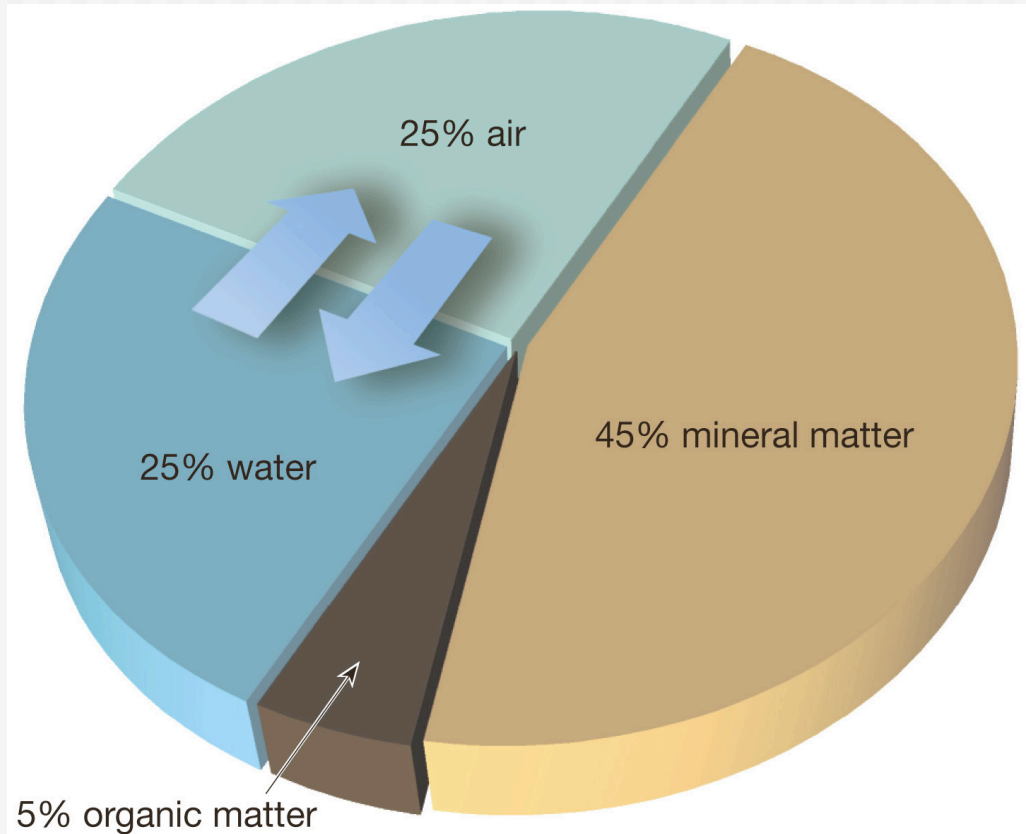
TABLE 6.1**Products of Weathering**

Mineral	Residual Products	Material in Solution
Quartz	Quartz grains	Silica
Feldspars	Clay minerals	Silica K^+ , Na^+ , Ca^{2+}
Amphibole (hornblende)	Clay minerals Limonite Hematite	Silica Ca^{2+} , Mg^{2+}
Olivine	Limonite Hematite	Silica Mg^{2+}

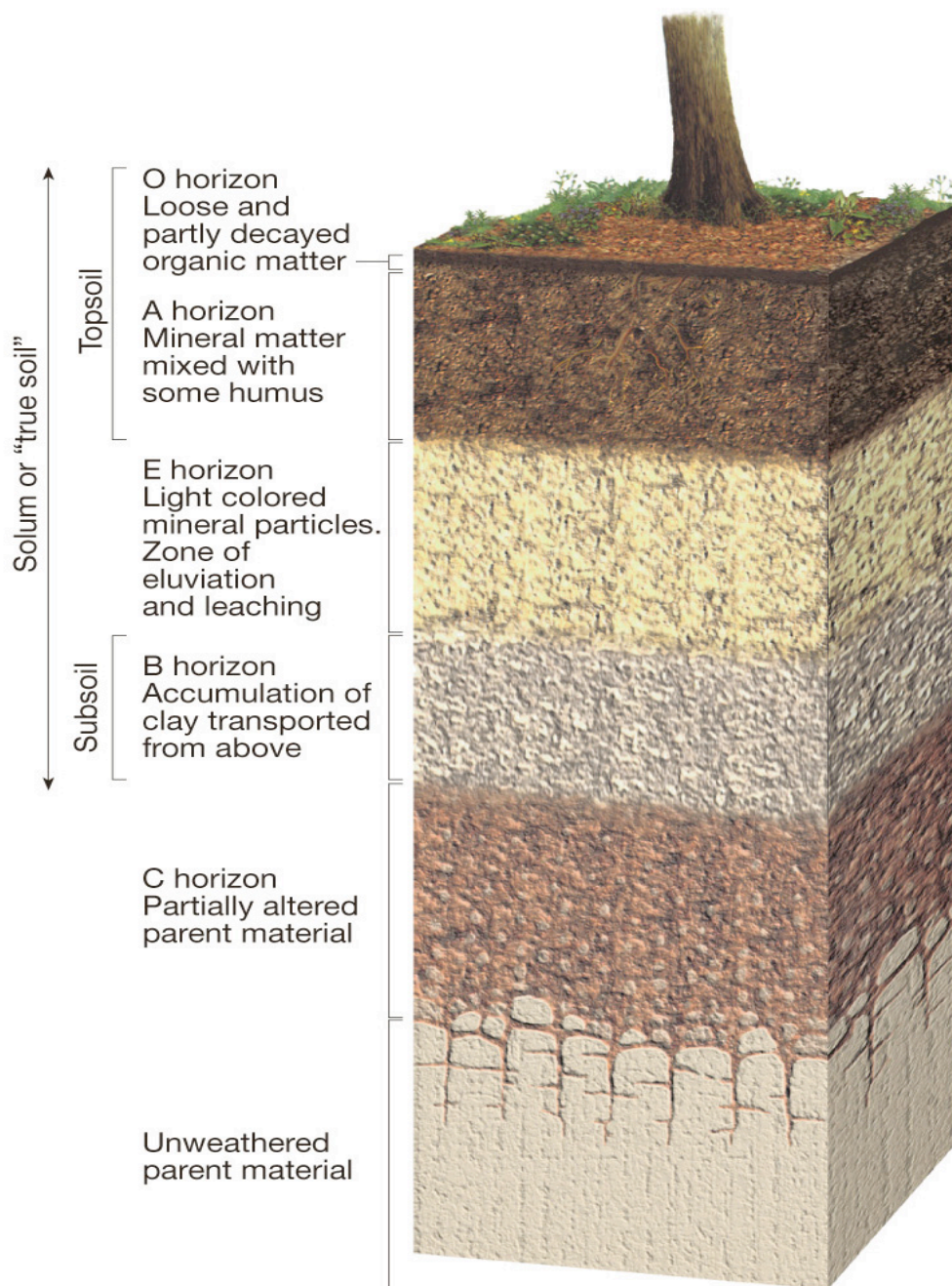
Soil Formation

■ **Factors controlling soil formation**

- **Parent material**
- **Time**
- **Climate**
- **Plants and animals**
- **Topography**



Copyright © 2005 Pearson Prentice Hall, Inc.



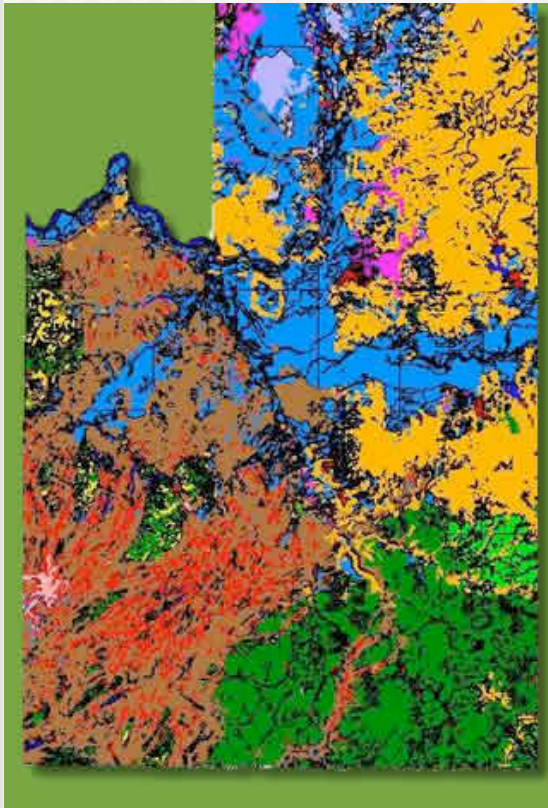
Copyright © 2005 Pearson Prentice Hall, Inc.

Idealized soil profile

O, A, E, B, C and R

"Loam soils"

Soil Surveys

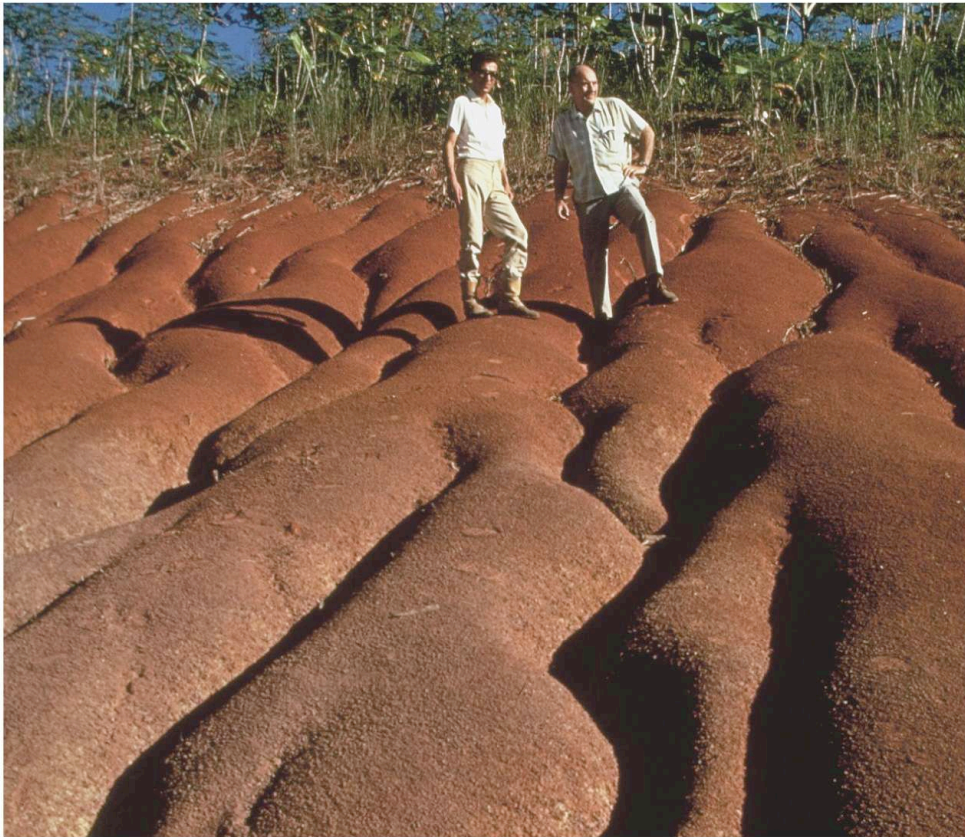


General Soil Groups

- **Pedocals**
- **Pedalfers**



Soil Erosion



B.

Copyright © 2005 Pearson Prentice Hall, Inc.

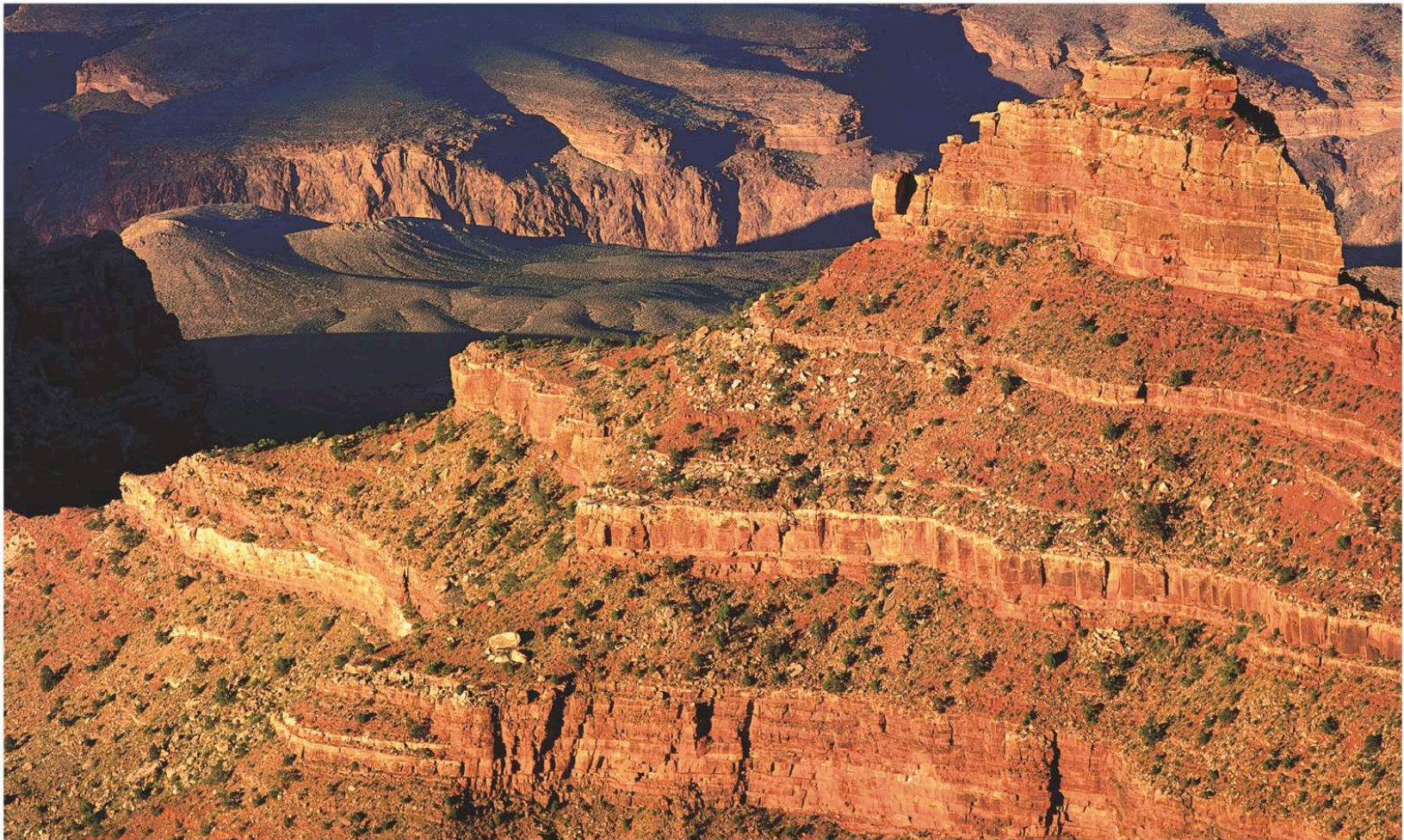


A.

Copyright © 2005 Pearson Prentice Hall, Inc.

Sedimentary Rocks

“Layered Rocks”



Copyright © 2005 Pearson Prentice Hall, Inc.

History = Diagenesis

Erode
Transport
Deposit
Solidify
Rock



A.

Copyright © 2005 Pearson Prentice Hall, Inc.

Classification

- Clastic, SS, S, C
- Chemical, LS
- Biochem, chalk, fossils, coal



Copyright © 2005 Pearson Prentice Hall, Inc.



B.



Copyright © 2005 Pearson Prentice Hall, Inc.

Sedimentary Rocks

A Vertical Record of Geologic History

Law of Superposition--Steno 1669

