Columbia Supercontinent (1.5 Ga.)

Columbia (supercontinent)

Columbia / Nuna
1,590 Million years ago (Mya)

TS = Transscandinavian igneous belt
YM = Yavapai - Mazatzal
RN = Rio Negro - Jurena

Migmatite, Mya:
- 1380-1350
- 1600-1300

Presumptive subduction
Columbia, 1590 Mya
Sedimentary Basins, 1800-1000 Mya
Mountain range formations, 1660-1500 Mya
Cratons older than 2300 Mya

Sources:
Zhang et al. 2012
Pesonen et al. 2012
Evans & Mitchell 2011
Rodinia Supercontinent (750 Ma.)

Mozambique Ocean

Grenville orogenic belts
pre-Grenville cratons

Rifts where Rodinia started to fragment 750 million years ago
Pannotia Supercontinent (600 Ma)

Pannotia (Greater Gondwana) 600 Ma

Cathaysia, Indochina, Sibumasu, Cimmeria

Gondwana (Africa, S. America, Madagascar, India, Antarctica, Australia, Arabia)

Panthalassic Ocean

Pan African

Laurentia Baltic Siberia

SAm

Cd

L

B
Geologic Structures in Cambrian Laurentia
The Sloss Seas
Walther’s Law

- Facies show a **transgressive** pattern when the sediment supply is overpowered by a relative rise in sea level, or when the land subsides tectonically. Both cause the shoreline to move landward.
Walther’s Law

- Facies show a **regression** pattern when the shoreline moves seaward due to an excess sediment supply from land, when the land is tectonically uplifted and the sea level retreats, or when there is a relative lowering of sea level.
The Sloss Seas
Laurentia in the Cambrian Period
Ordovician Paleogeography

(b) Late Ordovician Period (448-438 M.Y.A.)

- Yellow: Evaporites
- Light brown: Lowlands
- Red: Mountains
- Light blue: Shallow sea
- Dark blue: Deep ocean
- White: Glaciation
Laurentian in the Ordovician Period
The Sloss Seas

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Silurian Paleogeography

(c) Late Silurian Period (421-414 M.Y.A.)

- Yellow: Evaporites
- Light Brown: Lowlands
- Red: Mountains
- Light Blue: Shallow sea
- Blue: Deep ocean
Laurentia in the Silurian Period
The Sloss Seas
Devonian Paleogeography

(a) Middle Devonian Period (380-374 M.Y.A.)

- Yellow: Evaporites
- Light brown: Lowlands
- Red: Mountains
- White: Shallow sea
- Blue: Deep ocean
Laurasia in the Devonian Period
Mississippian Paleogeography

(b) Early Carboniferous Period (352-333 M.Y.A.)

Legend:
- Yellow: Evaporites
- Green: Coals
- Orange: Lowlands
- Red: Mountains
- White: Glaciation
- Light Blue: Shallow sea
- Dark Blue: Deep sea
Laurasia in the Mississippian Period
Pennsylvanian Paleogeography

(a) Late Carboniferous Period (315-296 M.Y.A.)

- Yellow: Evaporites
- Green: Coals
- Light Brown: Lowlands
- Red: Mountains
- White: Glaciation
- Light Blue: Shallow sea
- Blue: Deep sea
Laurasia in the Pennsylvanian Period
Permian Paleogeography with Pangea
Laurasia in the Permian Period