

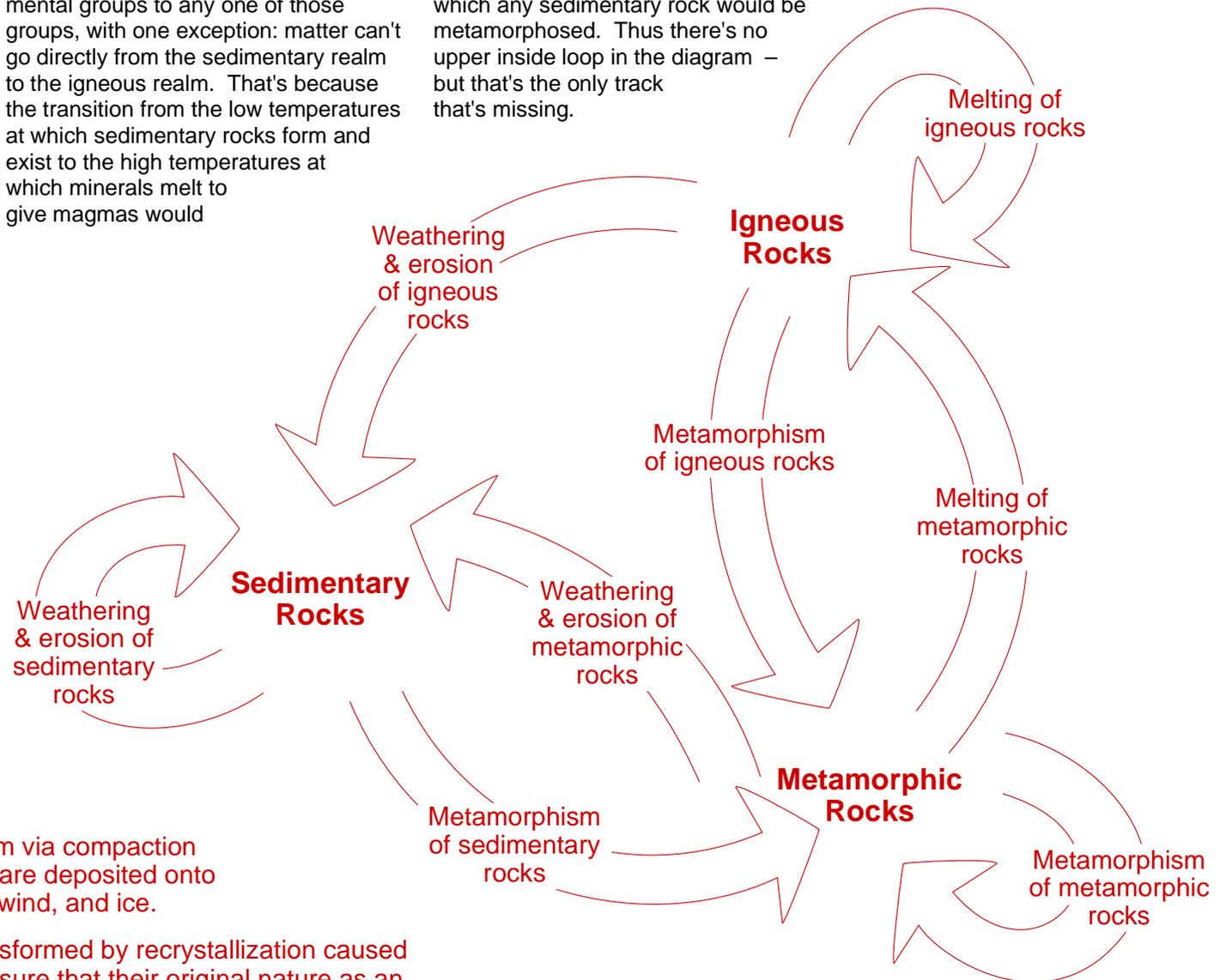
Rocks, Part II: the rock "cycle"

One much-loved concept in Geology is that of the rock cycle. In its simplest presentation, the rock cycle is the erosion of matter in igneous rocks to yield sedimentary rocks, the metamorphism of sedimentary rocks to give metamorphic rocks, and the melting of metamorphic rocks to give the magmas that form igneous rocks. That's the circle in the diagram at right.

Of course, things are in reality more open-ended. For example, sedimentary rocks are commonly eroded to give sediments that form new sedimentary rocks. That's the outside loop on the left in the diagram, and the other outside loops are likewise transformations within the other two fundamental groups of rocks. The two inside loops also add to the no-longer-cyclic picture. In fact, in the end it's easier to say that nature can transform

rocks from any one of the three fundamental groups to any one of those groups, with one exception: matter can't go directly from the sedimentary realm to the igneous realm. That's because the transition from the low temperatures at which sedimentary rocks form and exist to the high temperatures at which minerals melt to give magmas would

have to go through the temperatures at which any sedimentary rock would be metamorphosed. Thus there's no upper inside loop in the diagram – but that's the only track that's missing.



Igneous rocks: rocks that form via the cooling and crystallization of molten mineral material (magma).

Sedimentary rocks: rocks that form via compaction and cementation of sediments that are deposited onto the solid Earth surface from water, wind, and ice.

Metamorphic rocks: rocks so transformed by recrystallization caused by increased temperature and pressure that their original nature as an igneous or sedimentary rock can no longer be discerned