

Intrusive vs. Extrusive

- Melt that exists below the surface is called **magma** and rocks formed by this process are **intruded** (pushed) into preexisting rocks and referred to as **Intrusive Rocks**
- Melt that is erupted on the surface is called **lava** and rocks formed by this process are **extruded** (pushed) onto the surface and referred to as **Extrusive Rocks**

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Intrusive Environments

- Rising magma moves through preexisting rock and crystallizes at depth –
- Rocks formed in this
 - from
- Results are observed

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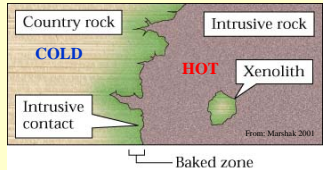
Intrusive Environments

- Preexisting rocks are
- The contact between the two is an _____ contact
- Chunks of _____ can be incorporated into the magma forming _____.

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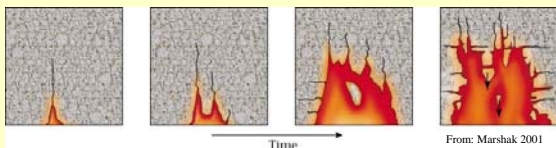
Intrusive Environments

- The hot magma comes in contact with colder country rock
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Intrusive Environments



Time →

From: Marshak 2001

Rising magma (_____ - upward excavation) moves into country rock and _____

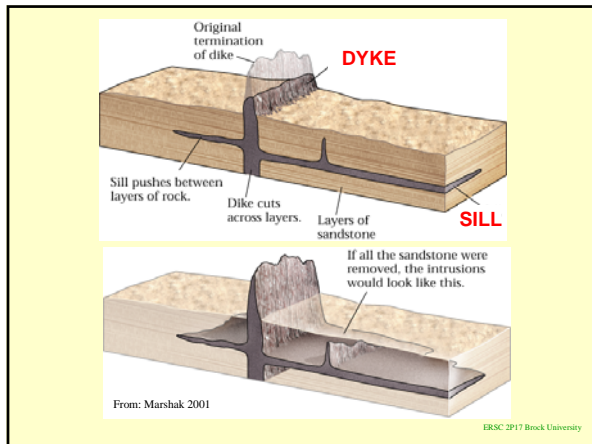
Country rock is _____

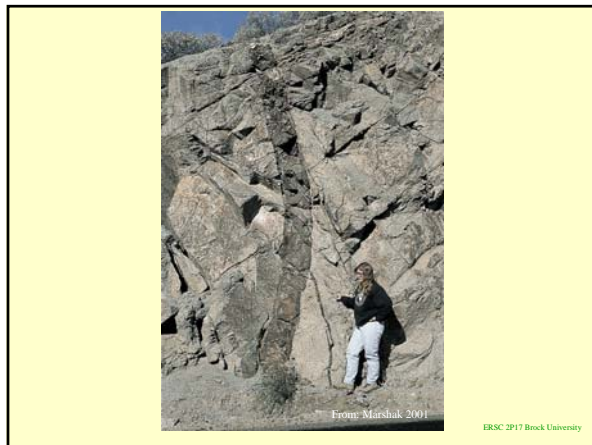
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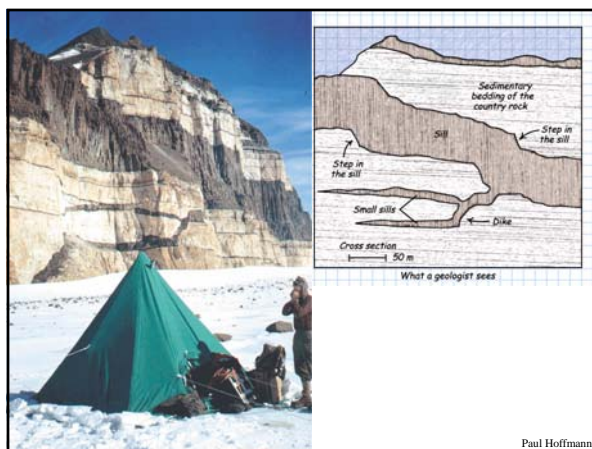
Types of Intrusives

- Distinguished by shapes
- Tabular intrusions
 -
- Vertical intrusions are termed _____
- Horizontal intrusions are termed _____

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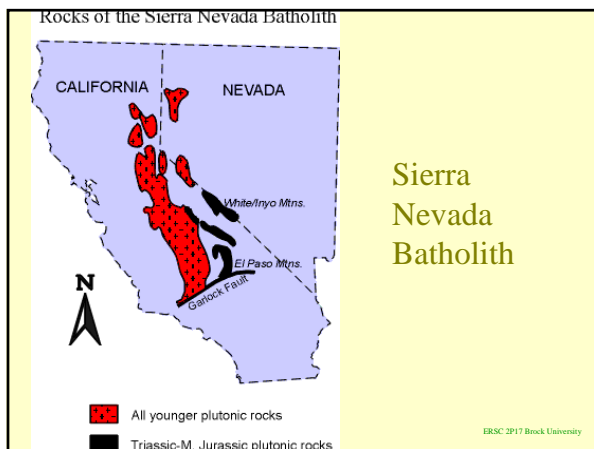




Types of Intrusives

- Where a sill is _____ a blister-like intrusion results - a _____
- _____ are irregular shaped intrusions ranging in size from from 10's of m to 10's of km across
- Intrusion of multiple plutons in one area creates a composite body - a _____
 - 100's of km long X 10's to 100's of km wide

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Mount Whitney Crest, SN Batholith

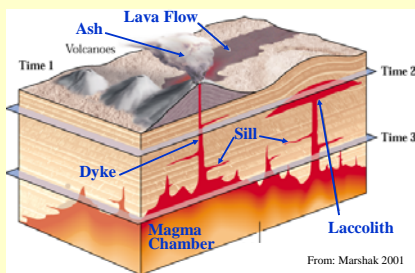


Types of Intrusives

- Intrusive igneous rocks form
- We can observe them at present as they are brought to the surface over long periods of geologic time through:
 -
 -
 -

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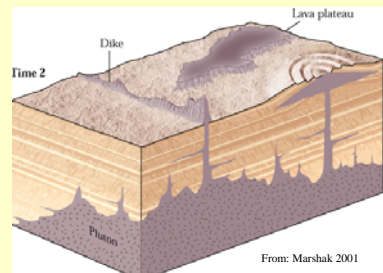
Intrusive Environments



At an active volcano a magma chamber is present in the subsurface and serves as the source of magma that forms dykes, sills, laccoliths below ground, and lava and ash above ground.

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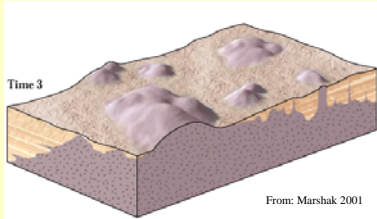
Intrusive Environments



As a result of crystallization, the magma chamber becomes a pluton. The softer portions of the volcano erode, leaving wall-like dykes and resistant lava plateaus.

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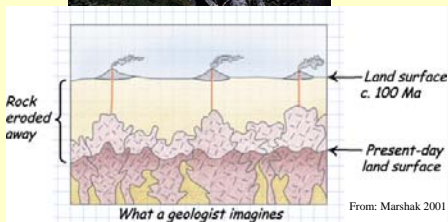
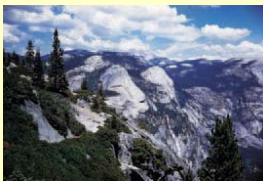
Intrusive Environments



From: Marshak 2001

As weathering and erosion continue the volcanic rocks and shallow intrusions are removed and plutonic rocks are exposed.

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From: Marshak 2001

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