Dome Mountains

Description of Model 5: Dome Mountains

The mountain mass in the northern part of the model is an example of a dome mountain. Originally sedimentary rocks arched over the large granite mass. The sedimentary rocks have been eroded from the highest part of the range, leaving a granitic area exposed in the center (79). The dipping sedimentary formations surrounding the granite now appear as ridges around the edge of the dome. The stronger beds such as the sandstones and limestones form hog-backs or cuestas (80). The weaker beds, such as the shales form valleys. This landscape has been created mainly by erosion. The subsequent streams (82) of the region have carried away the eroded material and deposited it on the broad flood plain of the main river valley shown on Model No. 6. The eastern two-thirds of the model is covered with vegetation with the exception of two areas of wind blown sand (83). This suggests higher rainfall in the areas colored green. The western portion of the model depicts arid land lying in the rain shadow of the alpine peaks to the west.

Straight walled canyons, mesas, buttes are the characteristic topographic features to be found in arid regions where the sedimentary strata have been undisturbed.

The southern edge of the model depicts oil deposits beneath the surface. Many years ago this region was beneath the sea and tiny plants and animals that lived there died and sank to the bottom of the inland sea. As sediments were washed in from the land, the remains of these organisms were trapped in the sediments. As time passed, more and more sedimentary deposits were laid on top of the remains of these organisms. As great pressure compressed the lower layers into rock, a combination of heat, chemical action and pressure changed the remains of these organisms into droplets of oil and gas.

Later the sedimentary beds were disturbed by pressure from beneath. This pressure produced a series of arches or anticlines.

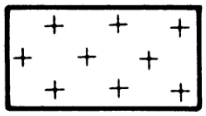
The oil and gas are lighter than the water that saturates the porous rock layer (97). The lighter oil and gas tended to rise to the top of the anticline, and the oil and gas were prevented from going further by a layer of impervious shale, here depicted in green.

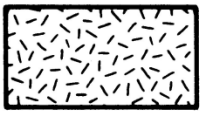
A salt dome may also be seen on the south edge of the model. Salt domes are formed by the upward movement of salt from a deeply buried deposit. Here we see how a salt plug has penetrated a shale, a sandstone, and yet another shale bed. An oil trap has been formed on either flank of the salt dome.

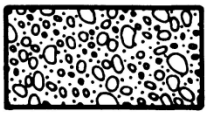
from Geology Models Study Guide by Robert B. Lewis

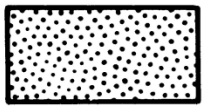
LEGEND

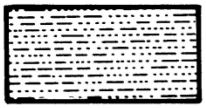

OIL

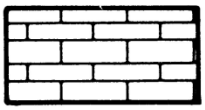

SALT


GRANITE


GLACIAL TILL


SANDSTONE


SHALE


LIMESTONE

Model 5: Dome Mountains Find each feature on the model and write the number of the feature in the table below. Answer the questions below.

Feature Number	Feature Name
	Dome Mountain
	Circular Hogbacks
	Rock Outcrop
	Subsequent Stream
	Sand Hills
	Butte
	Canyon
	Mature Valley
	Cap Rock
	Stream Terrace
	Faulted Sandstone Plateau
	Granite
	Unconformity
	Fault

1. How is the landscape in this Model mainly formed?

2. What happens to the eroded material?

3. What is the origin of the oil and natural gas deposits?

4. How did the answer in Question 3 above become these petroleum deposits?

5. Can you explain how 'fracking', hydrolic fracturing, could be used in features 96 and 97 to obtain petroleum (oil and gas)? (Hint: 96 is semiporous rock containing oil and gas and 97 is salt water. Also the oil and natural gas deposits above, 94 and 95, would be removed first.)

6. What is the difference between a Butte and a Mesa?