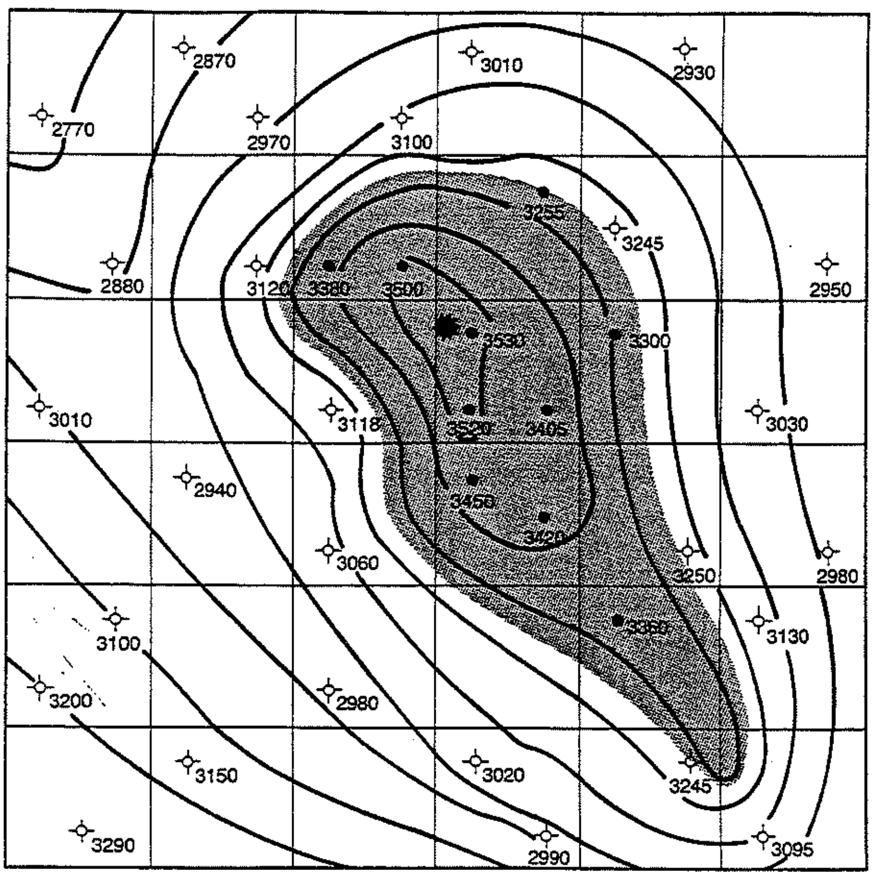
6. Wells A and B have no oil, because they cut through the reservoir beds below the level where oil would have been floating on water. Wells B, C, and D all cut through the reservoir beds at a level high enough to encounter the oil.

7. -Units 9 through 3 are sediments deposited as horizontal sheets, one atop the other, from 9 to 3. Other units may have been present on top of unit 3, but they no longer exist if they ever did.
-The sequence of units 9 through 3 was folded, then cut by a normal fault.
-Erosion removed units above unit 3 and the upper parts of unit 3 and 4.
-Units 2 and 1 were deposited (in that order) on top of the erosional surface to form an angular unconformity.
-The top of unit 1 is at the present surface of the land and is being eroded presently to form an unconformable surface.

Part 3: Constructing and Using Maps of Subsurface Geology (pages 271-272)

8. fold-related (dome- or antiform-related) structural trap

9. See completed Figure 16.6 below for the best location to drill a new well.



Shaded area indicates portion of map area that is underlain by hydrocarbons. Remaining areas are underlain by salt water.

8-1

✸ Best place to drill a new hydrocarbon well.

10. NW ¼, NW ¼, sec. 15

11. The new well must be located as close as possible to the very highest point in the dome or antiform, because the thickest layer of gas and/or oil will migrate there (until it is all pumped from the reservoir).

12. At the location of the new well (answer to Question 10), the sandstone is about 600 feet thick, and the elevation of the top of the sandstone is about 3550 feet. To reach the bottom of the sandstone, the well has to be drilled to an elevation of 2950 feet.

Part 4: Seismic Cube Analysis and Interpretation (page 273)

13. salt dome (or fold-related) structural trap

14. -well data (if available)
-lithologic descriptions of the rock/sediment units
-porosity and permeability of the rock/sediment units
-information about what rock/sediment units oil or gas occurs in, in areas adjacent to the salt dome

Part 5: Plate Tectonics and Mineral Resources (pages 273-275)

15a. Students should draw a point 150 km below Mt. Rainier, then draw a line from this point to the top of the JFP at the western edge of the subduction zone. They should also draw a line representing the base of the JFP as dashed on the completed Figure 16.10 on the next page of this book.

15b. The Nazca plate in the Andean subduction zone subducts about 150 km into Earth over a horizontal distance of about 250 km (Figure 16.9 on page 274 of the lab manual), but the Juan de Fuca plate in the Cascade Range subducts about 150 km into Earth over a horizontal distance of about 350 km (measured from trench to Mt. Rainier in completed Figure 16.10 on the next page of this book). Therefore, the Juan de Fuca plate subducts beneath the Cascade Range at a lower angle than the Nazca Plate subducts beneath the Andes Mountains.

15c. Students should have vertical lines plotted approximately like the vertical long-dashed lines plotted on the completed Figure 16.10 on the next page of this book. They should also label the metal belts defined by such vertical lines as done on the completed Figure 16.10 here.

Students should also note that the metal belts of the Cascade Range seems to have the same general distribution as the metal belts of the Andes Mountains.