Name _____ Class _____ Date _____

CHAPTER 20 Critical Thinking Activity

The Eastern Mediterranean

Taking the Good with the Bad

Turkey and the city of Istanbul have long been considered the point where East meets West. That statement has been proven true on more than one level. Read the excerpt below and then answer the questions that follow.

Crossroads of both peoples and tectonic plates, the Anatolian region is rich with stories of cultures accommodating themselves to a violent geologic landscape. Humans in this part of the world have long blamed the Earth's sudden and violent changes on supernatural agents. In 464 B.C., when an earthquake destroyed Sparta and provoked an uprising of serfs, the ancient Greeks blamed Poseidon, the earth shaker.

A geophysicist supplies the scientific explanation: "There's a full-scale continental collision going on, where Africa and Arabia are driving north and colliding with Eurasia." That collision, which has continued over the past five million years, creates a complex pattern of geologic processes that fascinate scientists just as they mystified and devastated ancient cultures.

The collision began in eastern Turkey and affects most of Anatolia, the peninsular part of the country. Arabia, which is moving north slightly faster than Africa, hit first, and when it shoved into the underbelly of Eurasia, it thrust up the Caucasus Mountains.

The collision has thickened the continental crust in eastern Turkey, now about 30 miles thick, compared with some 25 miles thick farther west near Ankara. As a result, the region, which lay near sea level before the collision, is now a plateau averaging more than a mile high. In some places, jagged remnants of ancient seafloors that once lay between the colliding continents jut from the compressed landscape as mountains. Most of the rock in those seafloors, however, was pressed down toward Earth's mantle. This stimulated melting and the formation of magma that resurfaced through cracks to form volcanoes such as Mount Ararat.

Much of Anatolia's westward movement occurs along a particularly dangerous geologic feature known as the North Anatolian Fault. That fault, which separates Anatolia from the rest of Eurasia, runs east to west just south of the Black Sea. About 75 miles before it reaches the Sea of Marmara, the fault forks into at least two strands. The sea, which reaches depths of more than 4,000 feet, is actually a rift, pulled apart by tension between the strands, which continue westward across the Aegean to Greece.

In the Marmara area the North Anatolian Fault has caused immeasurable devastation. In the past 2,000 years almost 600 documented earthquakes—40 of them magnitude 7 or greater have hammered the region.

The force that gives rise to most of the earthquakes that plague the Aegean region of Turkey is called extension. As the subducting African plate

stretches and thins the crust, great cracks known as grabens open up. The grabens become valleys that fill with fertile sediments.

Extension in the Aegean has enriched the soil of southwestern Turkey. But the same process, occurring too rapidly and accompanied by centuries of deforestation, has encouraged the buildup of too much silt in places, turning waterways into swamps.

It takes either a sturdy boat or a kilometer of bridge to cross the Bosporus today, but people may have walked cattle across the Bosporus—which means "ox ford"—before Mediterranean sea water started spilling through the strait into the Black Sea Basin some 7500 years ago. It is possible that an earthquake caused the rupture that opened the strait. Istanbul, perched on the banks of the Bosporus, has weathered dozens of major earthquakes in the 1,700 years since Roman Emperor Constantine made it the empire's new capital. Adding to Constantinople's glory, in 537 Emperor Justinian inaugurated a domed cathedral then unparalleled—Hagia Sophia, or Holy Wisdom. "Solomon I have outdone you!" legend says he declared. It took only 20 years for an earthquake to inflict serious damage. The building still stands, many quakes and repairs later, buttressed along the way for stability.

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1. What are some distinctive features in Turkey caused by tectonic activity?

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2. Explain why Anatolia is a crossroads in geolgoic terms.

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3. What force has contributed to the fertility of soil in Turkey?

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4. How can the expression "taking the good with the bad" be applied to the geologic forces at work in Turkey?

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