

the United States end must take place between 7 a.m. and 10 p.m. local time, and the Concorde still may not fly at supersonic speeds over U.S. territory.

Coleman ordered the Federal Aviation Administration to monitor noise and emission levels at both airports throughout the trial period, but he also cited the environmental impact statement prepared by the FAA in declaring that during the test, air quality effects would be "negligible," climatic effects "clearly insignificant" and low-frequency noise "not a serious objection."

His decision, however, does not fully resolve the matter, even for the test period. Environmentalist forces have threatened legal action to block the decision in the courts. In addition, while Dulles is a federally operated airport and thus under Coleman's direct jurisdiction, Kennedy is operated by the Port Authority of New York and New Jersey, which has yet to add its necessary permission. If the JFK go-ahead is withheld, says Coleman, "... that would obviously be extremely unfortunate and would greatly diminish, but in my opinion it would not destroy, the validity of the demonstration."

One possible concern that Coleman admitted was not part of his deliberations was whether the Concorde might "skim the cream" off the already troubled transatlantic market. Matters of competition, he said, are concerns of the Civil Aeronautics Board. □

Magnetic turtle points the way

Civilizations flourished in Mesoamerica long before Columbus set sail. Exactly where and when Central American civilization got its start is still a mystery, but clues have been found. The highly complex and precise 260-day calendar of the Mayas, for instance, may have originated in Izapa, an ancient ceremonial center on the Pacific coastal plain of southern Mexico. Evidence for this theory was put forward in 1973 by Vincent H. Malmstrom of Dartmouth College. Now he reports another bit of circumstantial evidence that again points to Izapa as the cradle of civilization in the New World.

The evidence is a stone sculpture that depicts the head of a turtle. While examining astronomical alignments of various structures at Izapa, Malmstrom put his compass near the turtle head and noticed a sharp deflection of more than 60 degrees. No matter where the compass was placed along the perimeter of the sculpture, the needle continuously pointed to the snout of the turtle. No other stones or sculptures in the area were found to have magnetic properties. "This would suggest," says Malmstrom in the Feb. 5 NATURE, "that the Izapans knew about magnetism in that they had reserved a

basaltic boulder rich in iron ore for their carving of the turtle head, and had executed it so carefully that the magnetic lines of force all came to a focus in the snout of the turtle."

Why a turtle? Clearly, says Malmstrom, the Izapans, a sea-faring people, were impressed by the navigational and homing abilities of the sea turtles common to the area. Whether or not they applied their knowledge of magnetism to navigation or to anything else is unknown, but later Mesoamerican civilizations did.

Malmstrom believes the magnetic turtle to be about 3,300 years old. A hand-worked piece of magnetized iron ore

thought to be about 3,000 years old was discovered at an Olmec site (SN: 9/6/75, p. 148). And the later Mayan civilization, which was influenced by the Olmecs, appears to have made extensive use of magnetism in the alignment of their cities. Many run along an axis that is 17 degrees east of north, indicating that a magnetic compass was used.

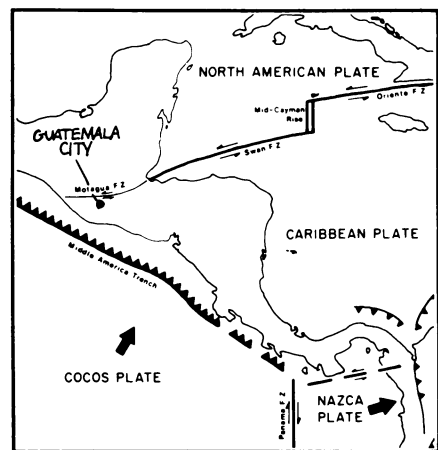
If Malmstrom's theory of cultural diffusion in Mesoamerica is correct, the Izapans were the originators of at least two important ideas—the 260-day calendar and magnetism—and Izapa can be considered the cultural hearth of the New World. □

Guatemala quake: Plate-triggered



Guatemalan disaster is marked by flattened homes in Patzicia near Guatemala City.

In 1773, when a major earthquake devastated Guatemala's then-capital of Antigua, planners decided to relocate the capital on what appeared to be safer ground: a vast tableland, the present site of Guatemala City. The safer ground was dealt a major blow by another quake in 1917, another in 1942. The latest, which struck on Feb. 4, measured 7.5 on the Richter scale and took a catastrophic toll estimated as high as 25,000 lives, with still more injured and homeless.



Motagua fault follows plate boundary.

Guatemala City lies scarcely 10 miles north of a chain of volcanoes, many of them active, extending from Mexico down through Guatemala, Honduras, Nicaragua and Costa Rica. It also sits vulnerably atop an insecure footing of thick layers of relatively loose-packed volcanic debris, close to the Motagua fault zone. But the underlying cause of the Feb. 4 quake, a group of U.S. Geological Survey scientists believe, is more deep-seated still.

The Motagua fault zone, which apparently includes the epicenter of the quake (120 miles northeast of Guatemala City), lies on or near the boundary between the North American and Caribbean plates, two of the great crustal plates that move slowly but inexorably over the mantle of the earth. The USGS researchers, Charles Knudson and George Plafker from Menlo Park, Calif., and Alvaro Espinosa and Raul Husid from Denver, together with Karl Steinbrugge of the University of California at Berkeley, believe that the grinding of the plates against each other may have ruptured the fault much as similar plate motions have caused major quakes along the San Andreas and related faults in California. The team is now in Guatemala, studying the area at that country's request. □