ilishu, an interpreter from Meluhha, reports NYU's Wright in a forthcoming book. What may be Shu-ilishu and his wife are featured on a seal wearing Mesopotamian dress. There is some evidence for a village of Indus merchants between 2114 and 2004 B.C.E. in southern Iraq. And “a man from Meluhha” knocked out someone’s tooth during an altercation and was made to pay a fine, according to a cuneiform text, hinting at a life that was neither faceless nor boring.

Indus archaeologists still confront fundamental research questions, including how a far-flung array of cities adopted standardized measures. There is little or no data on how the Indus people governed themselves, what language they spoke, and whether they engaged in war. Some researchers envision a collection of city states, while others imagine regional powers that jockeyed for influence but generally cooperated. What is clear is that the organization differed from the pharaonic ways of Egypt and the rival kingdoms of Mesopotamia. “We don’t need to use the models from the Near East,” says Kenoyer. “What was once seen as a monolithic state was actually a highly diverse set of multiple centers of power that negotiated across a large landscape.”

With barely one-tenth of the 1000-plus known Indus sites examined, archaeologists say the next frontier is the smaller sites that could reveal more about day-to-day life. That could fill in the gaps about how the Indus people worshipped, traded, and governed themselves. “There are thousands of villages,” says Shinde during lunch break at the Farmana dig. “And it is our fault that we only go to the big sites.”

Researchers are also bringing the latest archaeological tools to bear on Indus artifacts, closely examining the origins of stone used in beadwork, the prevalence of certain animals and plants, and even the methods used in butchering. Archaeologists also recognize an urgent need to chart climate change throughout the region during the Indus era. “It’s a great tragedy,” says Bish. “It is a book waiting to be read.” Whatever archaeologists uncover in coming years, the revised story of the Indus civilization is sure not to be a dull read.

—ANDREW LAWLER

Indus Collapse: The End or the Beginning of an Asian Culture?

The puzzling downfall of an ancient civilization more than 3 millennia ago sparks debate today in both scientific and political circles

While Egypt was in chaos and the Akkadian Empire in Mesopotamia collapsed in the 22nd century B.C.E., the marketplaces of Mohenjo Daro in today’s Pakistan were booming. Carts pulled by water buffalo jauntily decorated in henna carried luxury goods along the city’s wide, paved streets. Artisans worked lapis lazuli from distant Afghanistan into beads and shaped local steatite into delicately carved seals. Citizens drew water from one of the city’s 700 wells or relaxed under the colonnades around a large brick-and-tar lined bath in the center of town.

Yet 2 centuries later, the carefully planned metropolis was abandoned, and the number of settlements on its outskirts dwindled from 86 to a mere half-dozen. The cultures of Egypt and Mesopotamia recovered in time, but not so the Indus. Mohenjo Daro and other great cities were never rebuilt, a set of sophisticated symbols was forgotten, and vibrant urban life vanished from the Indian subcontinent until much later.

This anomaly is the most puzzling and controversial issue surrounding the Indus civilization, which thrived from 2600 B.C.E until 1900 B.C.E. (see timeline). Droughts, floods, tectonic shifts, ideological turmoil, and foreign invasions have all been invoked to explain a spectacular collapse that long appeared both sudden and total. But new research suggests that the end may not have been as dramatic or complete as scholars long assumed. Some cities lingered for up to 500 years after others were deserted, and the next wave of urbanism arose far earlier than once thought.

The rise of Hindu nationalism in today’s India has thrust this scholarly debate into the political spotlight. Hindu nationalists’ push to see the roots of their religion in the 5000-year-old Indus civilization creates yet another barrier between Indian archaeologists and their mostly Muslim counterparts in Pakistan (see sidebar, p. 1282). “There is no place in the world where the people and culture of the 3rd millennium B.C.E. are more important,” says archaeologist Gregory Possehl of the University of Pennsylvania.

Archaeologists have theorized about the end of the Indus for decades. In the 1940s, excavator Mortimer Wheeler suggested that Aryan tribes who swept in from the northwest triggered the
downfall. These Aryans were long thought to have brought Vedic culture—considered the root of Hindu tradition—to India at the expense of the Indus people. “Indra stands accused,” Wheeler famously wrote, referring to the chief Aryan deity. But there is no archaeological evidence for an invasion during this period. Many scholars agree that people did migrate into the region from north and east but not until after the decline of the Indus.

More recently, some researchers have proposed that climate indirectly affected the Indus. They postulate that the drought-related collapse of Egypt and Mesopotamia and the loss of those markets at the turn of the 2nd millennium B.C.E. led to an economic crisis that upended the Indus system a century or two later. Mentions of Meluhha, presumed to refer to the Indus, vanish from Mesopotamian texts about 2000 B.C.E., says Harvard University Assyriologist Piotr Steinkeller.

Climate may have hit the Indus directly as well. According to a 2003 paper, cores drilled from the Arabian Sea indicate that during the 22nd century B.C.E., the Indus River and its tributaries discharged significantly less water, a sign of drought. By 2000 B.C.E., people near Harappa in today’s Pakistan were trying to cope with a drying climate by planting different crops, according to recent research led by Rita Wright of New York University (Science, 18 May 2007, p. 978). “People were making adjustments; there was a change in their way of life,” Wright says, although she cautions against making sweeping claims because her data are from only one region.

Although Wright and others argue that climate and society are deeply intertwined, Possehl scoffs at the idea that drought explains the collapse. “We should stop thinking about the physical world and start looking at the fabric of society,” he suggests. He believes that the end of the Indus was primarily a matter of ideology, like the collapse of the Soviet Union. Possehl and Michael Jansen of RWTH Aachen University note that the Great Bath at the center of Mohenjo Daro was abandoned a century or two before the city, suggesting change in a society that they say emphasized water-related rituals.

In the end, Wright, Possehl, and other scholars acknowledge that they can’t be sure what caused the Indus decline. “There are a lot of theories but little evidence,” complains Harvard archaeologist Richard Meadow, who co-directs current excavations at Harappa.

But the collapse was likely as varied as the civilization itself. Mohenjo Daro and the region of Cholistan, between that city and Harappa, declined dramatically after 1900 B.C.E. However, while rural settlements near Harappa contracted from 18 to four at this time, life in the city surprisingly continued for at least another 500 years, says archaeologist Jonathan Kenoyer of the University of Wisconsin, Madison, co-director of the Harappa dig. And to the northeast, in today’s India, the number of sites increased rapidly from 218 to 853 after 1900 B.C.E., according to data from surveys gathered by Possehl.

In Gujarat in southwestern India, urban life and even trade with the Arabian side of the Persian Gulf appears to have continued well

Farzand Masih, excavator at Ganweriwala, Pakistan.

TRENCH WARFARE: MODERN BORDERS SPLIT THE INDUS

FARMANA, INDIA—Vasant Shinde and Farzand Masih work a mere 200 kilometers apart, each perhaps an hour or so from the border between India and Pakistan. But neither archaeologist can visit the site of the other. “I’m excavating at Farmana,” says Shinde of Deccan College in Pune, India. “On the other side is Ganweriwala—but I can’t know what’s going on there or talk to the archaeology team.” Masih of Punjab University in Lahore, Pakistan, leads that team and says he’s eager for international collaboration, but for now including Indians is beyond his power. Nor can he visit Shinde’s site.

That’s because the fault line resulting from the bitter partition of British India in 1947 runs through the middle of what was once the Indus civilization, one of the world’s first great urban societies from 2600 B.C.E. to its puzzling collapse in about 1800 B.C.E. (see main text). Back then, Indus merchants may have traveled freely over the region’s plains and hills. But today the Indus’s 1 million square kilometers are split between Pakistan and western India (see map, p. 1278). The cities of Mohenjo Daro, Harappa, and Ganweriwala are in Pakistan, while Dholavira, Rakhigarhi, and Farmana lie just across the border in India. Hundreds of other settlements are spread across the Indus plain in one nation or the other.

Each country has fought serious skirmishes in the Himalaya, built nuclear weapons with their adversary in mind, and laid claim to the Indian state of Kashmir. The politics make it difficult if not impossible for archaeologists from one side to roam the countryside of the other. “Secret police would follow us every step—if we could get a visa,” says one South Asian archaeologist.

Scientists on both sides say that a host of research topics would make more sense if done collaboratively. For example, understanding the complex geomorphology of the Indus and its

Spinning wheel. Modern carts in today’s Pakistan resemble toy carts (inset) crafted by Harappans thousands of years ago.
into the 2nd millennium B.C.E., although exactly how long is a matter of dispute. At the site of Pirak in eastern Baluchistan in today’s Pakistan, a small town appears to have thrived continuously from 1800 B.C.E. to as late as the arrival of Alexander the Great in India in 325 B.C.E., says Meadow. Later settlements, however, lack the sophisticated urban planning of even smaller sites from the mature Indus phase.

The persistence of settlements raises the question of how much of the Indus culture survived the urban decline. For decades, most archaeologists assumed that the Indus’s abrupt end and long hiatus in urban life meant that few if any of its traditions survived. But now it appears that the Indus collapse drove people to the east, into the watershed of the Ganges, which spreads as far as the Bay of Bengal. Excavations along the Gangetic plain show that cities began to arise there starting about 1200 B.C.E., just a few centuries after Harappa was deserted and much earlier than once suspected. That means that some continuity between the first and second wave of Indian civilization is conceivable, says Possehl.

There is no doubt that the hallmarks of the Indus disappeared with its cities, including its unique set of specific symbols, sophisticated standardization of weights and bricks, and rectilinear urban planning. Later urban areas along the Ganges are radically different in layout; the new writing system that eventually emerged is unrelated to Indus symbols; and standardization is missing.

But archaeologists such as Possehl see deeper connections. “There is continuity,” he says. A handful of Indus seals showing a deity with three faces in a yogic-style posture may link today’s Hindu god Shiva and yoga practices with the Indus civilization. And a variety of technologies and traditions, such as tandoori ovens, ox carts pulled by water buffalo, and cattle marked with henna are a regular part of village life around Mohenjo Daro even today. Traces of all these scenes can be found at Indus archaeological sites and imprinted upon seals.

Did the Indus directly seed what eventually grew into the second wave of Indian civilization? That is a hot political as well as scholarly topic. “This plays a significant role in today’s India,” says Possehl. The Bharatiya Janata Party (BJP), which ruled India from 1998 to 2004, declared the Indus to be the progenitor of Hindu civilization, a controversial claim in a country with a large Muslim population. While in power, BJP pumped additional funding into Indus-related digs, and its influence over archaeological matters remains strong. Last fall, the Archaeological Survey of India (ASI) was harshly criticized in Parliament for asserting in a report that the underwater ridge connecting India and Sri Lanka was natural rather than the remains of a bridge built by the traditional hero Rama. Under pressure, ASI suspended two senior employees involved in the report. In May, members of India’s Supreme Court expressed sympathy for a lower court decision ordering ASI to investigate the formation.

Some Indian scholars argue that early Hindu texts can be used as guides, much as the Bible has been used in Near Eastern archaeology. Respected ASI archaeologist R. S. Bish, who excavated Dholavira and can quote long passages from Hindu scripture, suggests that the Indus people were one and the same as the Aryans whom Wheeler saw as invaders. That theory finds little purchase with foreign scholars. And one Western archaeologist complains that such talk makes for a volatile mix of science and religion that is “needlessly inflammatory to our Pakistani colleagues.”

The intense emotion surrounding the debate is exacerbated by the many questions that remain about the Indus’s decline. “There is no silver bullet; there were clearly multiple factors,” says Meadow. “And we still don’t know what was the trigger.” But, he says, recognizing that complexity is itself a big step forward.

—ANDREW LAWLER

tributaries can’t be done without cross-border studies. Comprehensive analyses of ancient climate require regional sampling. And because the research communities are so divided, discoveries in one country may go unnoticed in the other; archaeologists say they have little knowledge of what takes place across the border. Given the lack of published papers and personal connections, even digital and virtual collaboration is rare.

Foreigners can make the trip between the two countries with relative ease, and a few European, Japanese, and American researchers frequently work on both sides. But archaeologists from India and Pakistan have only rare and fleeting opportunities to meet, such as at international conferences.

“We need to be able to put together all the pieces,” says Qasid Mallah, a professor at Shah Abdul Latif University in Khairpur, Pakistan. “That includes the Indian portion too.” Adds Shinde: “It would be more beneficial if we could all work in both India and Pakistan, particularly for the students.”

Politicians and administrators in both countries have shown little interest in using archaeology as a tool for détente. The director general of the Archaeological Survey of India, Anshu Vaish, says her organization has no plans to push for more cooperation. And the recent elections in Pakistan, which resulted in an uneasy coalition, make dramatic initiatives from that side unlikely.

To circumvent the political reality, Shinde helped create the Society of South Asian Archaeologists in 2005. Most Indian and Pakistani archaeologists couldn’t afford to go to international conferences, so he proposed a new organization—registered under the Indian government but classed as a private group—to hold meetings closer to home. For the first conference in Mumbai in 2006, a few Pakistanis secured visas, although others did not. The second meeting was held 25 to 27 May in Shiraz, Iran, on neutral ground, and the next gathering is to be held in Sri Lanka in 2010. Shinde says that despite growing pains, the group now has 400 members from six countries. In the meantime, he and Masih will go about their respective business, so close, and yet so far.

—A.L.

Vasant Shinde, excavator at Farmana, India.