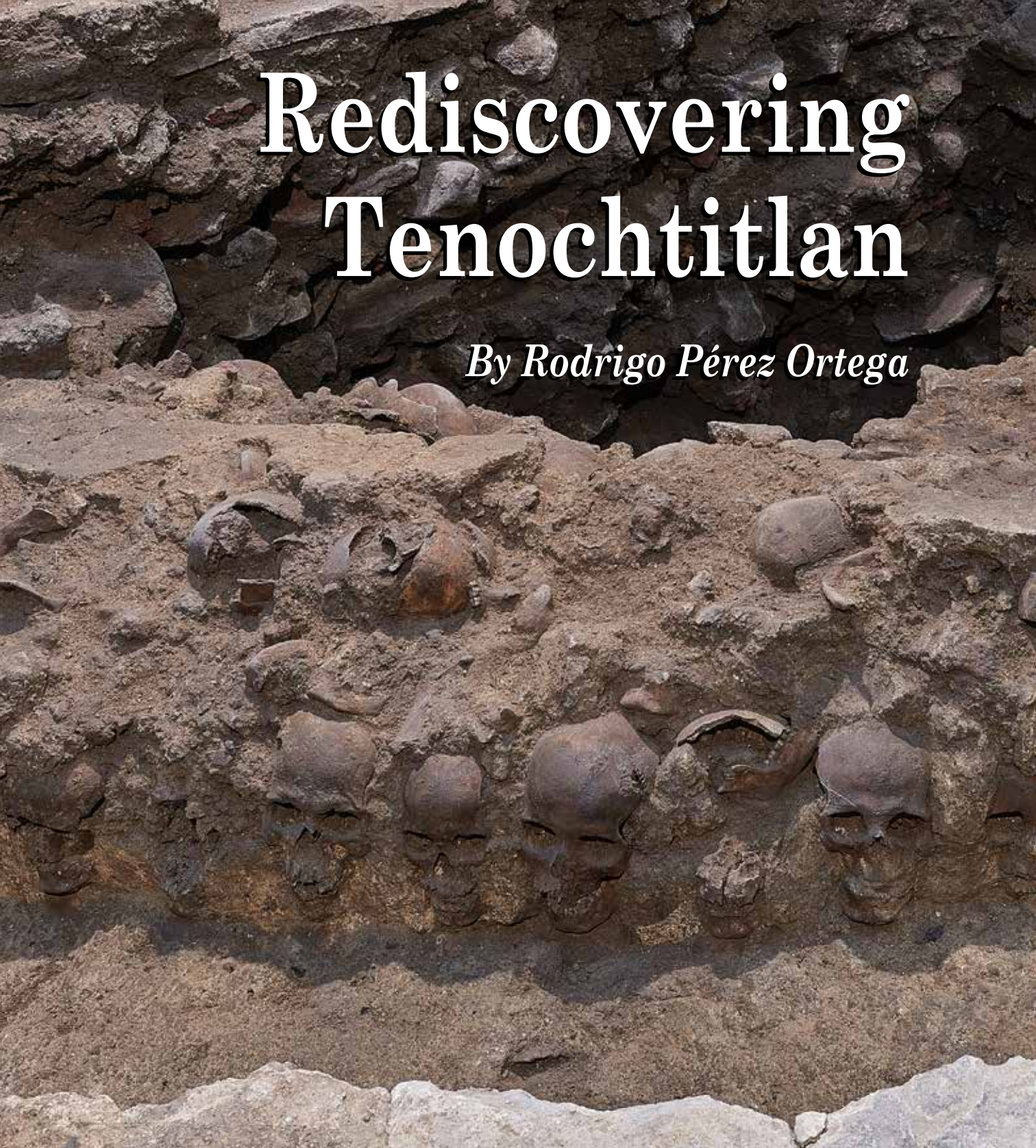


Rediscovering Tenochtitlan

By Rodrigo Pérez Ortega



Decades of excavations in the heart of what is now Mexico City are revealing details about the Aztec capital that lies beneath it.



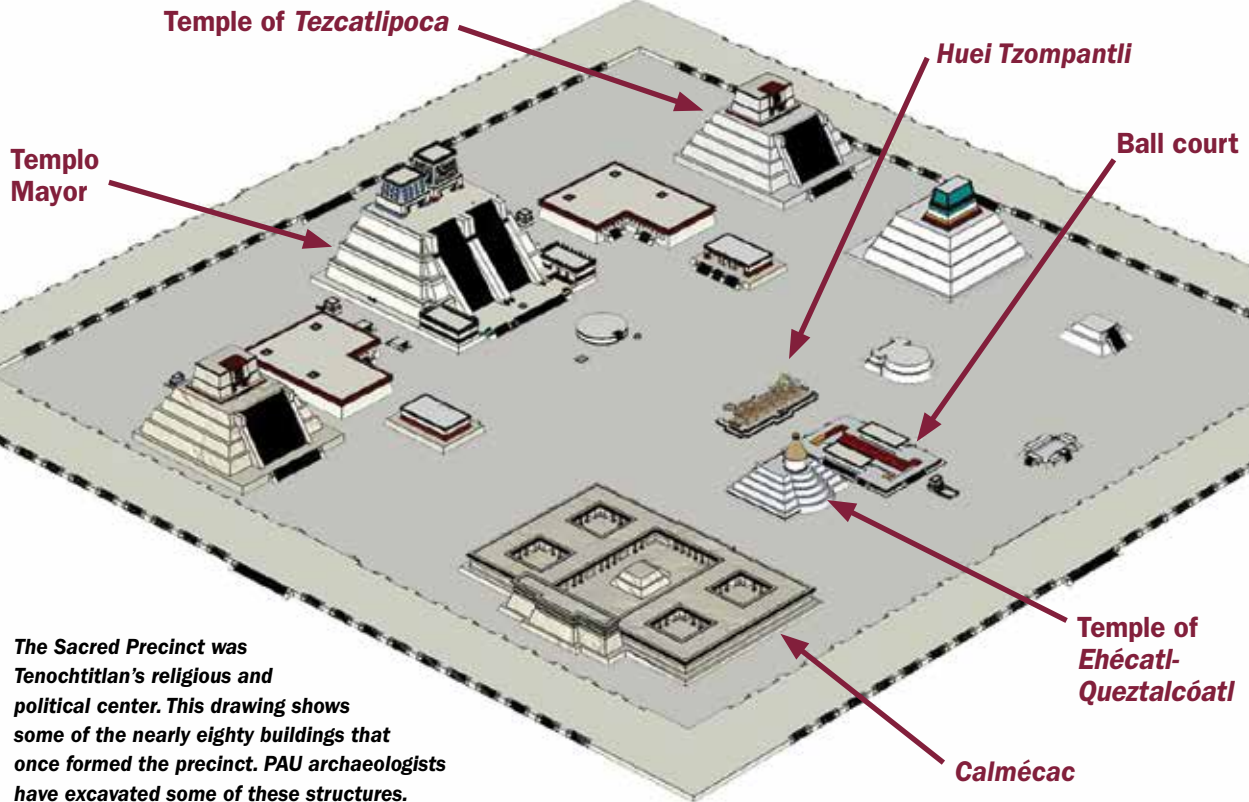
Archaeologists have uncovered a portion of an Aztec skull rack known as the Huei Tzompantli.

RAÚL BARRERA RODRÍGUEZ and his team had excavated almost the entire building in the heart of Mexico City. After digging twenty test pits, they had found evidence of the Spanish occupation and had reached the pre-Hispanic levels. But they were only finding slab floors and there was no sign of anything more exciting. “We were surprised we
american archaeology

hadn’t found it yet, because we knew it was there,” said Barrera Rodríguez. The excavation season was coming to an end in two weeks and the team was growing anxious. Eventually, hundreds of skull fragments started to appear. They had finally found it—it being the *Huei Tzompantli*, a giant rack dedicated to the Aztec war and sun god, *Huitzilopochtli*,

In 2009 and 2010, PAU archaeologists excavated the Temple of Ehécatl-Quetzalcóatl, the Aztec god of the wind.





The Sacred Precinct was Tenochtitlan's religious and political center. This drawing shows some of the nearly eighty buildings that once formed the precinct. PAU archaeologists have excavated some of these structures.

built with the skulls of several thousand human sacrifice victims.

No one had seen the Huei Tzompantli since the Spanish and their allies destroyed it after the fall of Tenochtitlan, the capital of the Aztec Empire, on August 13, 1521. (Though they are often called Aztecs, the residents of Tenochtitlan referred to themselves as the Mexica.) Spanish historical documents mentioned it, but experts warned that details of their accounts might be inaccurate. Finding it not only helped archaeologists have a better understanding of the controversial Aztec practice of offering human lives as tribute to their gods, it also helped them understand what the great Tenochtitlan, the *axis mundi* of the empire, looked like 500 years ago.

The discovery, which made headlines when it was announced in 2015, was just the latest one from the *Programa de Arqueología Urbana* (Urban Archaeology Program), or PAU, which features a sixteen-person team led by Barrera Rodríguez, an archaeologist at Mexico's National Institute of Anthropology and History (INAH). For the last thirty years, the PAU has dug into Mexico City's past, unearthing everything from important Aztec buildings to colonial artifacts. And with every excavation more of Tenochtitlan is exposed in so-called archaeological windows—glass floors that offer a glimpse of the ruins underneath modern-day buildings of downtown Mexico City. These ruins are a constant reminder of the powerful empire that once ruled the Basin of Mexico and most of northern Mesoamerica.

"It's a fantastic project," says David Carballo, a Mesoamerican archaeologist at Boston University who is not involved with the PAU. "It really is critical to Mexico's american archaeology

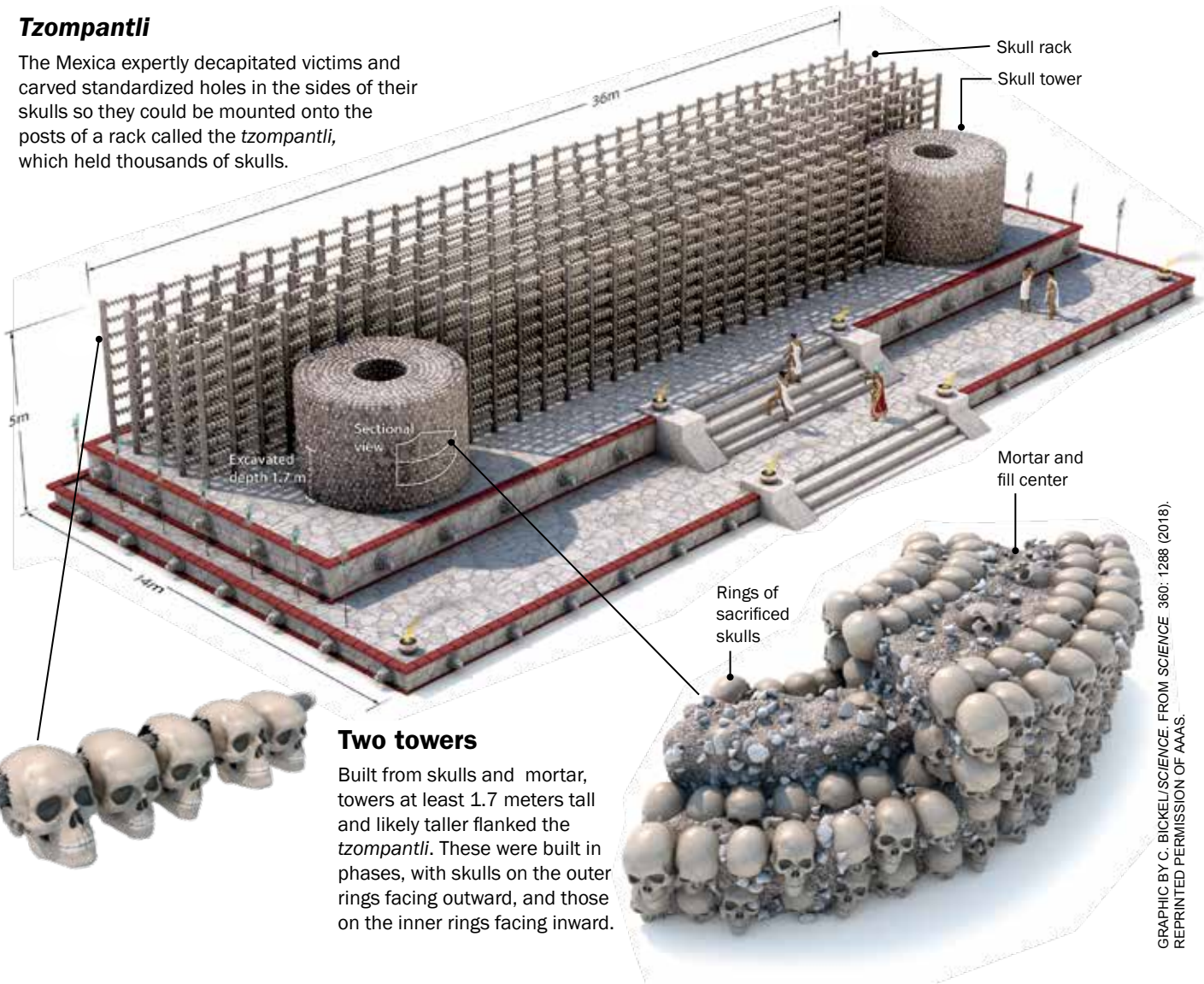
commemoration of its own history. In a very tangible way, [the fact that] one of the largest cities in the world involves the public in appreciating this history is a really important undertaking."

At first glance, downtown Mexico City resembles other colonial cities in Latin America. North of the Zócalo, one of the largest squares in the world, the Metropolitan Cathedral, built by the Spanish, dominates the landscape. To the east, the National Palace, a long colonial building, serves as the residence of Mexico's president. But just a block away from the cathedral's gardens, the ruins of an Aztec pyramid emerge between modern-day structures. Once 147 feet tall, with two temples on top—one dedicated to Huitzilopochtli, and the other to the rain god, *Tlaloc*—what's left of the Templo Mayor (Great Temple) contrasts with the rest of the city's façades. The Templo Mayor is only a beacon of what is buried less than eighteen feet below the city center. It's estimated that nearly eighty buildings that form Tenochtitlan's Sacred Precinct, the capital's main religious and political center, lie beneath colonial structures that the Spanish built to erase Aztec culture.

Before February 21, 1978, the Templo Mayor was itself forgotten and buried; but on that day electrical workers serendipitously came across a big, pre-Hispanic monolith on the site. Archaeologists subsequently noted that it depicted the Aztec moon goddess, *Coyolxauhqui*. A month later, INAH archaeologist Eduardo Matos Moctezuma founded the Templo Mayor Project to excavate the pyramid. The amount of artifacts and information they were finding kept growing, so that Matos Moctezuma inaugurated the Templo Mayor Museum nine years later to house artifacts and host

Tzompantli

The Mexica expertly decapitated victims and carved standardized holes in the sides of their skulls so they could be mounted onto the posts of a rack called the *tzompantli*, which held thousands of skulls.



Two towers

Built from skulls and mortar, towers at least 1.7 meters tall and likely taller flanked the *tzompantli*. These were built in phases, with skulls on the outer rings facing outward, and those on the inner rings facing inward.

GRAPHIC BY C. BICKEL/SCIENCE. FROM SCIENCE 360: 1288 (2018). REPRINTED PERMISSION OF AAAS.

exhibitions. At that point, unintentional archaeological discoveries by construction workers were so common around the Templo Mayor, Matos Moctezuma saw the need to establish the PAU in 1991. Now, every time there is a construction project within a seven-block area around the Templo Mayor, Barrera Rodríguez and his team are called in to excavate any endangered archaeological remains.

While archaeologists with the Templo Mayor Project have been working non-stop for forty-three years, excavating at their own pace and carefully documenting their discoveries, PAU archaeologists are always racing against time so as not to disrupt the construction schedules, said archaeologist Leonardo López Luján, the director of the Templo Mayor Project. “There’s a lot of tension and stress,” López Luján said. Tenochtitlan once sat on a lake that the Spanish drained and filled in, resulting in Mexico City’s notoriously soft soil, which makes excavation extremely difficult. Still, Barrera Rodríguez and his team have produced “immensely important findings,” said Lopez Luján. “It is impossible to be an Aztec specialist and not be tuned in to every new find in these premier excavations,” said Frances F. Berdan, an Aztec anthropologist

with California State University, San Bernardino, who is not involved in the PAU projects.

DIGGING AT THE HEART of a major city is not something exclusive to PAU archaeologists. In Rome, for example, archaeological remains are discovered with every metro line extension. But in Rome’s case, the imperial capital declined slowly over time and its buildings fell apart. In contrast, the Spanish purposefully dismantled Tenochtitlan. They tore Aztec structures down to their foundations and then constructed their buildings on top of them. Colonial buildings, baroque churches, and neoclassic palaces survive in the city center. “Our historic center, without a doubt, is the richest in the Americas,” said López Luján.

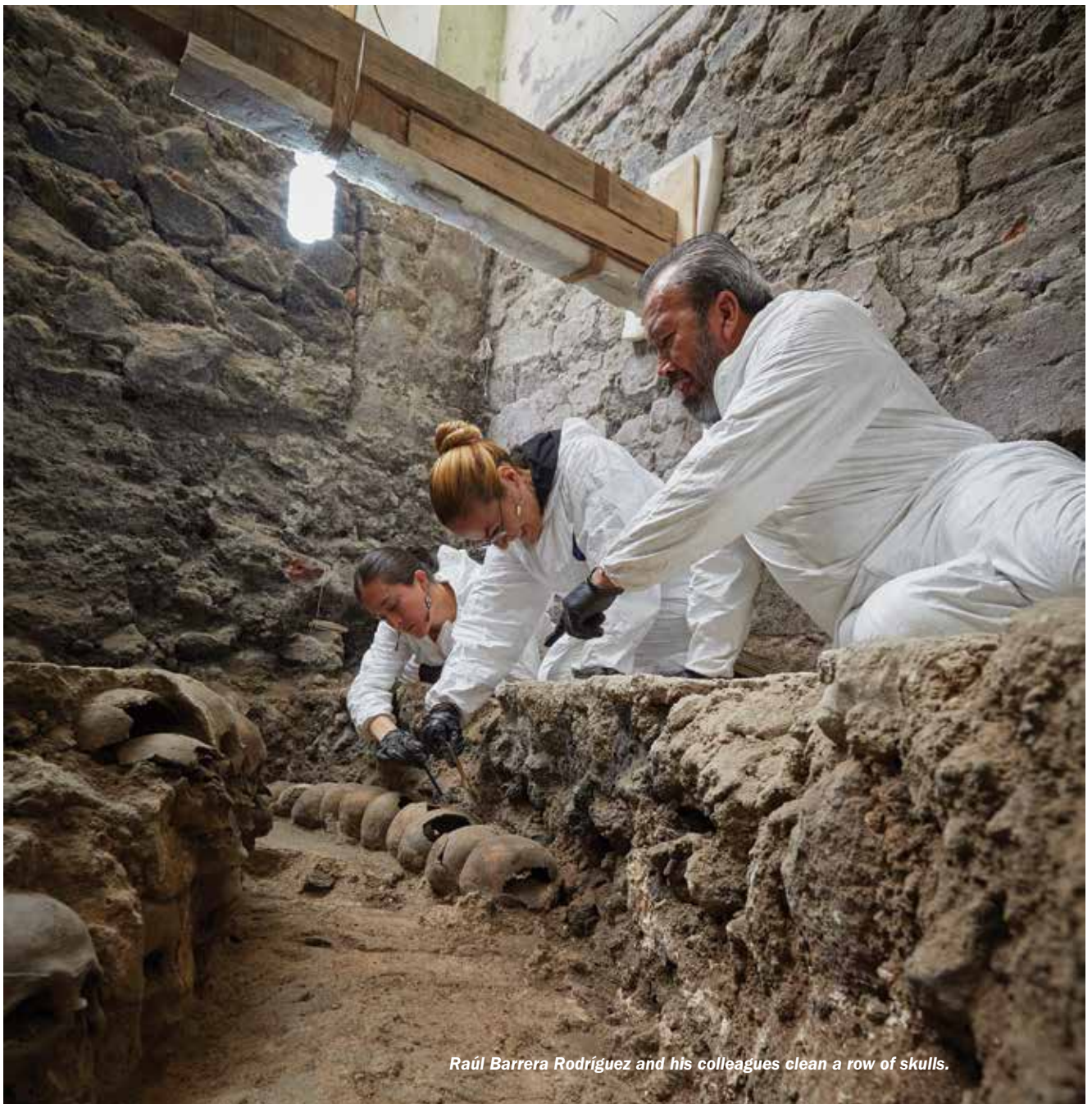
In many cultural resource management excavations, the archaeologists don’t have a clear idea of what they’ll find. That’s not the case for PAU archaeologists, thanks to Bernardino de Sahagún, a Franciscan friar who documented the Aztec conquest, and other Spanish chroniclers. Nonetheless, “The historical documentation is highly biased,” said Michael E. Smith, an Aztec archaeologist at Arizona State University

who is not involved with the PAU. “A lot of it is from Spanish sources and it doesn’t present a very accurate view of the nature of pre-Hispanic society.” The PAU’s excavations are revealing the real Tenochtitlan by elucidating the nature of the structures and their construction techniques, and by helping clarify the overall layout of the city’s central ceremonial precinct, according to Berdan.

For example, when the Centro Cultural España, which is located behind the Metropolitan Cathedral, underwent renovations between 2006 and 2008, an excavation by PAU archaeologists revealed the ruins of the *calmécac*, a school for the sons of the Aztec elite who studied to become priests or politicians. The school’s ruins, as well as eighty-eight objects dating back to the pre-Hispanic era, are now displayed in a museum in the building’s basement. Because of its privileged

students, the *calmécac*, is key to understanding the politics and hierarchy of the Aztecs, according to Carballo. “And then the fact that it got transformed into this basement museum that you can visit, I think, are just both great outcomes of that particular work,” he said.

Just behind the Centro Cultural España building, PAU archaeologists excavated a temple dedicated to *Ebécatl-Quetzalcóalt*, the Aztec god of the wind, between 2009 and 2010. The ancient building, they determined, was built in three stages. During subsequent excavations in 2014, they also found what is likely to be Tenochtitlan’s main ball court, roughly twenty feet south of the temple. For the Aztecs, the ball game was symbolically linked to human sacrifices, so it was no surprise that they also found vertebrae of around thirty individuals, some of them very young.



Raúl Barrera Rodríguez and his colleagues clean a row of skulls.

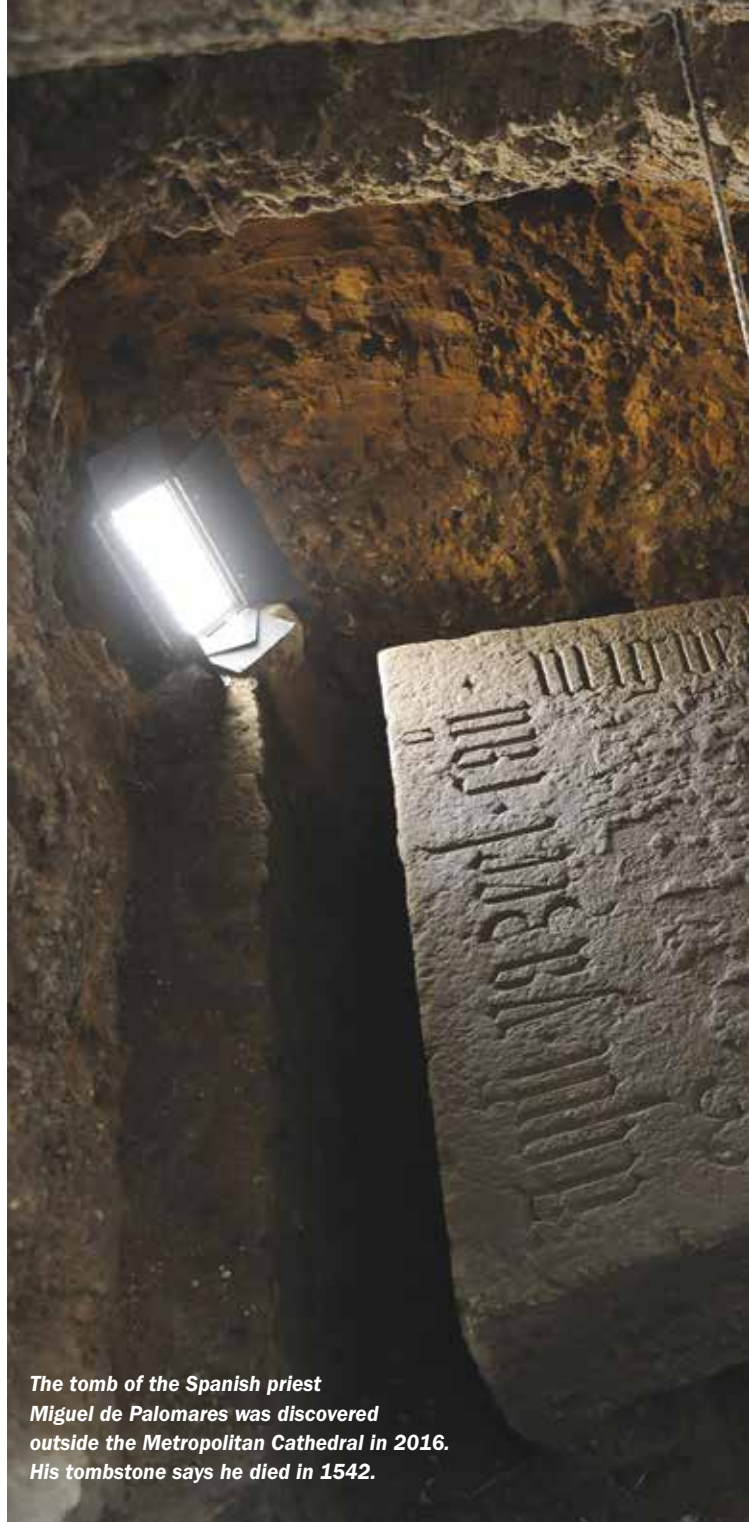
West of the Temple of *Tezcatlipoca*—Tezcatlipoca was an Aztec god associated with darkness—Barrera Rodríguez and his team found remnants of stone walls, rooms, and floors that may be associated with the temple. They also found a stove made of adobe, and patios made of slabs of basalt and polished stucco. These structures, together with almost forty objects that include Aztec obsidian blades and colonial plates, pots, jars, and a decorated animal bone, can be seen through one of many glass floors the PAU has installed to showcase their findings.

A very peculiar finding, according to Barrera Rodríguez, is the Palace of *Axayácatl*, who was the Aztec ruler of Tenochtitlan between 1469 and 1481. From 2017 to 2018, archaeologists excavated in the building of the Nacional Monte de Piedad, a non-profit pawnshop next to the cathedral. There, they uncovered basalt slab floors they think belong to what was an open plaza in the palace. Hernán Cortés, who led the conquest of Tenochtitlan in 1521, stayed there with his men from November 1519 until June of 1520, planning the siege of the city. In this very same palace, Moctezuma Xocoyotzin, then the ruler of Tenochtitlan, was killed on June of 1520, in the first months of the conquest war. “It is a highly emblematic place,” said Barrera Rodríguez. Years later, around 1524, Cortés ordered the destruction of the palace and the construction of his house with the very same stones. PAU archaeologists have found both structures.

WITH 603 SKULLS UNCOVERED so far, the Huei Tzompantli is the most spectacular of the recent PAU findings. Barrera Rodríguez and the team discovered it when excavating a building behind the cathedral. The structure, located just in front of the Templo Mayor, is flanked by two towers made of human skulls, one of which the archaeologists uncovered. “It was very surprising,” he said. Of all the Spanish chroniclers that mentioned the Huei Tzompantli, the largest of seven skull racks in the Sacred Precinct, only one mentioned the two towers.

The circular tower the team found, which was about fifteen feet in diameter, “is a sacred building which must have been imposing,” said PAU crew chief Lorena Vázquez Vallín. “It also has to do with a display of power and control of the towns” the Aztecs subjugated, as many of the victims were prisoners taken from these places. While the racks and their skulls were destroyed by Cortés’ orders, the tower still stands. Thus, she and the team can only estimate how many skulls form the Huei Tzompantli based on those forming the tower. Spanish documents are unreliable because they tended to exaggerate the number of people the Aztecs sacrificed in order to justify their conquest.

Vázquez Vallín sees the Huei Tzompantli as “the culmination and essence of the human sacrifice practice and the Mexica religiosity.” According to their religion, they had to continuously offer their victims’ hearts to the Sun, and the Huei Tzompantli also served as a “tree where seeds are planted for the existence of new human beings,” said Vázquez Vallín. For the Aztecs, the skulls represented the seeds needed for



The tomb of the Spanish priest Miguel de Palomares was discovered outside the Metropolitan Cathedral in 2016. His tombstone says he died in 1542.

the constant movement of the Sun, and thus the continuation of life.

Jorge Gómez Valdés, a physical anthropologist at INAH, joined the PAU team in 2017 to study the skulls in hopes of learning more about the victims. The researchers now know that most of the skulls in the Huei Tzompantli came from healthy adult males, and historical accounts suggest they were soldiers the Aztecs had captured in battle. Further studies are planned that will reveal more about these victims.

Barrera Rodríguez and his team hope they can keep excavating more of the Huei Tzompantli to find the second tower, but their opportunities are limited by future construction projects. They also hope they can find Tenochtitlan’s



other tzompantlis. But for now, they are busy analyzing their discoveries. In the future, Barrera Rodríguez would like to turn the discovery into a public museum.

López Luján estimated that both the Templo Mayor Project and PAU have excavated only about ten percent of the Sacred Precinct, and about one-tenth of a percent of Tenochtitlan. Despite that, they have found tens of thousands of objects that are providing important information about Mexico's past. "I would consider that Raúl, Lorena, and the whole team are revolutionizing the view that we have of the ancient Sacred Precinct of Tenochtitlan," López Luján said.

The Templo Mayor Project and PAU have endured thanks to laws protecting Mexico's rich history and INAH's **american archaeology**

stability. Having ample support from the federal government has been key for both programs. But due to the economic toll caused by the coronavirus pandemic, Mexico's president, Andrés Manuel López Obrador, ordered a seventy-five percent budget cut for several federal agencies, including INAH. "For the first time, our excavations are in danger," said López Luján. "It's brutal."

"There is no question in my mind that it is essential" that this research continue, Berdan said, because "there is so much still to be uncovered."

RODRIGO PÉREZ ORTEGA is a freelance science journalist based in Mexico City.