Khirbet Belameh, near the West Bank city of Jenin—rely heavily on foreign funds and expertise. But this dependence on outside help worries many Palestinian archaeologists. Khaled Nashef, director of the Palestinian Institute of Archaeology, for example, complains that over the decades foreign archaeologists have dug in Palestine and then gone away, publishing their findings in their own languages without translating them into Arabic. "We need to work with foreign archaeologists as equal partners, but it is not easy."

One fundamental obstacle to getting Palestinian archaeology off the ground is a severe lack of opportunities for students wanting to enter the field. Nearly all of the archaeologists in Palestine—who number, according to various estimates given to *Science*, between 15 and 25 with graduate degrees—were trained in other countries. The only institution that currently offers graduate-level training in archaeology is the Institute for Islamic Archaeology near Ramallah, which awards masters' degrees. The Palestinian Institute of Archaeology, which is part of Birzeit University and once also offered masters' degrees, suffered a major setback when its American director was murdered under mysterious circumstances in 1992. Today, it only offers an undergraduate minor in archaeology, although Nashef—who took over the rudderless institute in 1994—says he hopes to convince university administrators to restore at least a major in the subject soon.

As they wrestle with these legacies of the recent past, many Palestinian archaeologists express a strong desire to keep ideological and religious issues out of their nascent archaeological endeavors. This may prove difficult, because there is considerable evidence that the Palestinian general public—which is well aware that Israeli archaeology has often been linked with the search for Jewish roots in Palestine—appears hungry for archaeological discoveries that would prove that the Palestinians were here first. Over the past few years, a number of articles have appeared in Palestinian newspapers and magazines—and even on the PNA's Web site—claiming that Palestinians were descended from the Canaanites or other pre-Israelite residents of Palestine. In discussions with *Science*, most Palestinian archaeologists were quick to distance themselves from these ideas.

"We don't want to repeat the mistakes the Israelis made," says Moain Sadek, head of the Department of Antiquities' operations in the Gaza Strip. Taha agrees: "All these controversies about historical rights, who came first and who came second, this is all rooted in ideology. It has nothing to do with archaeology." But not all archaeologists here believe that issues of Palestinian national identity can be totally shunted aside. "This question cannot be avoided," says Nashef. "Until now we Palestinians have not worked to create our own history, and this is our own fault. Archaeology here has concentrated on historical events or figures important to European or Western tradition. This may be important, but it doesn't provide a complete picture of how local people lived here in ancient times."

Until Palestinian archaeologists can develop the basic infrastructure needed to conduct excavations, these thorny ideological issues will probably remain largely academic. In the meantime, they will be concentrating on constructing their budding discipline from the ground up. "We have the core human resources," says Mahmoud Hawari, an archaeologist who teaches at the Institute for Islamic Archaeology. "Now we just need to get ourselves together. It might be a gradual evolution, but it is no shame to start small."

—MICHAEL BALTER

THE HOLY LAND
RELIGION

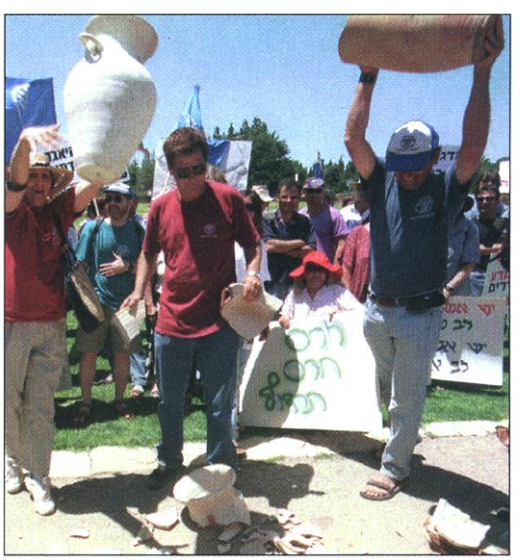
Archaeologists and Rabbis Clash Over Human Remains

Because of the influence of religious leaders in Israel, human remains cannot be studied and excavators face continual attacks from fundamentalists

JERUSALEM AND TEL AVIV—Patricia Smith, a physical anthropologist at Hebrew University in Jerusalem, and a group of co-workers published a paper 4 years ago in the journal *Gene* describing a new genetic technique for determining the sex of human remains unearthed in ancient burials. The technique—which relies on a small difference between the X and Y chromosomes in the gene coding for amelogenin, a protein important in the formation of tooth enamel—looked promising for studying bone fragments or the remains of children, whose sex is very difficult to determine even from complete skeletons. Indeed, when Smith and her colleagues applied the test to fragments of DNA extracted from tooth and bone samples from Israeli archaeological sites ranging from 200 to 8000 years old, the team was able to determine unambiguously the sex of 18 out of 22 of them, including young children.

The amelogenin test could help shed light on the family relations and other gender-related issues in ancient societies across the world. But in Israel, the country where it was devised and which has a wealth of archaeological remains, the technique can no longer be used legally. Neither can any of the other scientific techniques anthropologists routinely bring to human remains unearthed in archaeological digs. The reason: In 1994, in the wake of protests by ultra-Orthodox Jewish leaders against disturbing ancient graves, Israel's attorney general ruled that any human remains must immediately be handed over to the ministry of religious affairs for reburial. But even this measure has not satisfied some ultra-Orthodox groups, which today continue to mount violent demonstrations against digs that might uncover human bones, even when they are unlikely to be the remains of Jews or Israelites.

"Physical anthropology is no longer carried out at Israeli excavations," says Amir Drori, director-general of the Israel Antiquities Authority (IAA). And archaeologists here say the result is a great loss of important information—including data about the transition from Canaanite to Israelite settlement in Palestine. "We were beginning to understand the longevity of the Canaanite populations in this region, the extent of in-group and outgroup marriages, and the mechanisms of population



Picking a bone. Israeli archaeologists smash pots in front of the Knesset to protest religious interference at excavations.

CREDIT: MATI STEIN/AP PHOTO

shifts over different time periods," says Arlene Rosen, an archaeologist at University College London who worked in Israel for many years. "Now all this research has come to a halt."

In 1998, in an attempt to calm the situation, the Israeli government appointed five Orthodox rabbis to the nation's Archaeological Council, a 38-member body of archaeologists and other experts that advises the IAA on granting excavation permits. Unlike the ultra-Orthodox activists, who argue that any disturbing of burial sites goes against Jewish law, Israel's Orthodox rabbis have generally agreed that bones can be removed so that digs can go on. But they still insist that they must be reburied without being studied. But this attempt at a compromise has not stopped the demonstrations. Last June, for example, an altercation between demonstrators and an archaeological team conducting a rescue dig at a construction site near the Ben Shemen interchange in central Israel prompted the police to shut down the dig temporarily and arrest two of the archaeologists.

"When a bulldozer hits a grave, what do they want us to do?" says Moshe Kochavi, an archaeologist at Tel Aviv University and chair of the Archaeological Council. "We can let the bulldozer destroy the grave, or we can let the archaeologists dig it." But Smith says that whatever their objections to disturbing Jewish remains, the religious leaders should have no say about what happens to non-Jewish remains: "What right do they have to assume authority over Phoenician, Canaanite, Bronze Age, or prehistoric peoples?"

But ultra-Orthodox leaders see things differently. "We have nothing against archaeology per se," says Rabbi David Schmidl, a leader of Atra Kadisha ("Holy Sites"), one of the main groups involved in organizing the protests. On the other hand, he told *Science*, according to Jewish law "it is forbidden to disturb the rest of these bodies. It angers the soul." Schmidl compares the controversy in Israel to the debates in North America between archaeologists and Native American activists, who have insisted on the return of Native American remains so they can be reburied (*Science*, 26 February, p. 1239). As for non-Jewish graves, Schmidl says, "it is a little less problematic to move the bones, but any grave deserves the proper honor."

Archaeologists and anthropologists had hoped that the new government of Prime Minister Ehud Barak would be more sympathetic. So far, however, the government has not shown any sign of making this a priority issue. "For politicians, it is a very minor issue they can give way on," says Smith. In the meantime, she adds, "a branch of science that has a major contribution to make is being stamped out."

–MICHAEL BALTER

CREDIT: D. HARRIS

THE HOLY LAND
▶ PREHISTORY

Unearthing Monuments of The Yarmukians

Despite the headline-grabbing biblical remains in this region, prehistorians are digging up a wealth of artifacts from earlier peoples

KIBBUTZ SHA'AR HAGOLAN—For any visitor to Israel, the ruins of Megiddo and Hazor or the cobbled streets of Jerusalem are a vivid reminder that the Holy Land is sacred to three major religions. Yet hidden away in caves and fields, usually well off the tourist path, prehistorians have found plenty of evidence that this fabled land was a major crossroads of human civilization long before the biblical period. Over the past decade, in the fields of this kibbutz just south of the Sea of Galilee, archaeologists have been excavating a splendid example: an 8000-year-old village built in stone that may have been the capital of the Yarmukians, one of the earliest Neolithic (New Stone Age) peoples to settle in modern-day Israel, Jordan, and Lebanon.

Ancient artistry. This figurine is one of more than 300 found at Sha'ar Hagolan.

In part, the 1990s dig has confirmed what earlier excavations here had shown: The Yarmukians were among the most talented artists of the Neolithic period, producing finely engraved pottery and beautiful, intricately carved figurines stunning enough to be displayed in art museums. Indeed, some of the more than 300 figurines unearthed here over the years were exhibited in New York City's Metropolitan Museum of Art last fall. But the excavations are also challenging the conventional view that the Yarmukians were seminomadic and pastoral, occupying their settlements only part of the year. Instead, the past few years of digging have uncovered the foundations of three monumental stone buildings, one of which measures 3200 square meters—one of the largest Neolithic structures ever discovered—as well as paved streets and alleys, all indications of a highly stable community.

The Yarmukians were first discovered in the 1930s, when early Jewish settlers at this site near the banks of the Yarmuk River—a tributary of the river Jordan—began plowing up figurines and a characteristic type of elaborately decorated pottery. When this same pottery began showing up at other sites of similar age, such as early settlement levels at Megiddo in northern Israel and Byblos in Lebanon, it became clear that it represented an ancient culture that had spread fairly widely in the Near East. But excavations at Sha'ar Hagolan by Israeli archaeologists during the 1950s failed to uncover any monumental buildings. Instead, the earlier team concluded from various large pits they found that the Yarmukians had lived in circular huts half buried in the ground, which was consistent with findings at other Yarmukian sites.

Thus the monumental buildings, which have been found only at Sha'ar Hagolan, might mean that this site had a special significance. "Sha'ar Hagolan might have been the territorial center" of Yarmukian culture, says archaeologist Yosef Garfinkel of the Hebrew University in Jerusalem, who is co-directing the excavations along with independent archaeologist Michele Miller of New York City. Garfinkel adds that the buildings, along with the well-defined streets and alleys, are evidence of highly organized communal activity. And Brian Hesse, an zooarchaeologist from the University of Alabama, Birmingham, who is studying the remains of animal bones here, says the dominant animal appears to be domesticated pig, with a "surprising" lack of fish and other aquatic animals even though the village was right next to a river.

Garfinkel says he has no idea what the purpose of the monumental buildings was, although he hopes to uncover more evidence in the coming years of excavation. As for the figurines, he assumes—as do most archaeologists who study figurines from Near Eastern sites—that they served some sort of religious purpose. But whatever their meaning, Garfinkel adds, "these are the most beautiful figurines in the ancient Near East. A lot of energy and symbolic thinking went into making them."

–MICHAEL BALTER