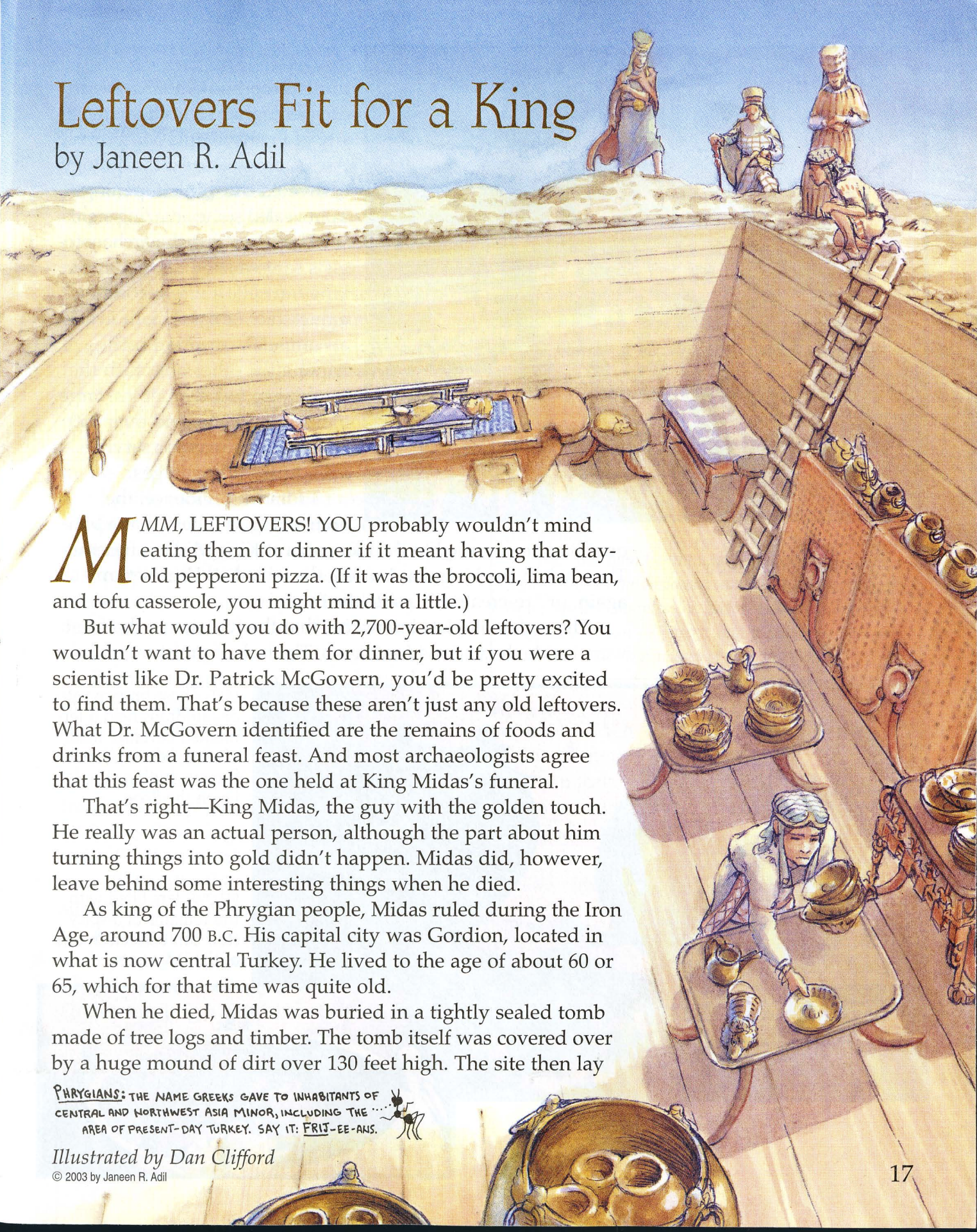


Leftovers Fit for a King

by Janeen R. Adil




MMM, LEFTOVERS! YOU probably wouldn't mind eating them for dinner if it meant having that day-old pepperoni pizza. (If it was the broccoli, lima bean, and tofu casserole, you might mind it a little.)

But what would you do with 2,700-year-old leftovers? You wouldn't want to have them for dinner, but if you were a scientist like Dr. Patrick McGovern, you'd be pretty excited to find them. That's because these aren't just any old leftovers. What Dr. McGovern identified are the remains of foods and drinks from a funeral feast. And most archaeologists agree that this feast was the one held at King Midas's funeral.

That's right—King Midas, the guy with the golden touch. He really was an actual person, although the part about him turning things into gold didn't happen. Midas did, however, leave behind some interesting things when he died.

As king of the Phrygian people, Midas ruled during the Iron Age, around 700 B.C. His capital city was Gordion, located in what is now central Turkey. He lived to the age of about 60 or 65, which for that time was quite old.

When he died, Midas was buried in a tightly sealed tomb made of tree logs and timber. The tomb itself was covered over by a huge mound of dirt over 130 feet high. The site then lay

PHRYGIANS: THE NAME GREEKS GAVE TO INHABITANTS OF CENTRAL AND NORTHWEST ASIA MINOR, INCLUDING THE AREA OF PRESENT-DAY TURKEY. SAY IT: FRIJ-EE-AUS. 

Illustrated by Dan Clifford

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ABOVE: The skeleton of a 60- to 65-year-old man lies on a pile of dyed cloth.

undisturbed until 1957, when archaeologists from the University of Pennsylvania Museum of Archaeology and Anthropology excavated the tomb. Opening it up revealed some amazing sights.

The first thing the archaeologists saw was the body of the king himself. It was resting on a thick pile of dyed cloth inside an unusual, open log coffin. Among the other objects in the tomb were wooden tables, large vats, pottery jars, and over 150 bronze containers for serving and drinking beverages.

From this evidence, the archaeologists knew that a banquet had been served to the mourners at King Midas's funeral.

Then, when the king was buried, the feast had been set up again, or "re-created," inside the tomb.

The archaeologists knew, too, that the remains of the feast were inside the various containers. The lack of moisture and air



LEFT: These bronze vats or cauldrons held a fermented beverage made of wine, beer, and mead. Bronze drinking bowls lie on the floor.

BELOW: Jars filled with the remains of a spicy stew can be seen in one of the large vats.



inside the tomb had preserved these leftovers. It took another 40 years, though, before they could tell just what had been on the menu.

Enter Dr. McGovern. He works for the University of Pennsylvania Museum in a very specialized role: he's an archaeo-chemist. Archaeological chemistry is a relatively new science, because its very sophisticated laboratory technology has only recently been developed.

Thanks to this technology, scientists can now identify the chemical makeup of ancient organic materials such as foods, dyes, and perfumes. The methods Dr. McGovern uses to analyze these materials include infrared spectrometry, liquid and gas chromatography, and mass spectrometry. (See sidebar.)

Dr. McGovern set to work analyzing the remains of Midas's funeral feast. First he looked at what the mourners had had to drink. Using samples collected from the bronze beverage containers, Dr. McGovern identified the chemical compounds. What he discovered was a fermented potion of grape wine, barley beer, and honey mead. The three had been mixed together, making one very strong drink!

But the mourners didn't just have drinks available: a spicy sort of stew was also on the menu. Samples from the pottery jars revealed either sheep or goat meat. Other chemical clues showed that the meat was probably barbecued first and then cut off the bone. Dr. McGovern found chemical traces of honey, wine, and olive oil, too. These may have been added as flavorings to the stew or used as a marinade for the meat. Plant materials—most likely lentils—were part of the stew as well. Finally, the meal was seasoned with herbs and spices such as anise or fennel.

As important as the chemistry part of his job is, scientists such as Dr. McGovern also have to know their archaeology. They've studied all about different groups of ancient peoples. Understanding a culture's customs, language, and lifestyle helps scientists make decisions about what they've learned in the laboratory.

FERMENTED BEVERAGES RESULT WHEN YEASTS, MOLDS, AND CERTAIN BACTERIA BREAK DOWN SUGARS, TURNING THEM INTO ALCOHOL.

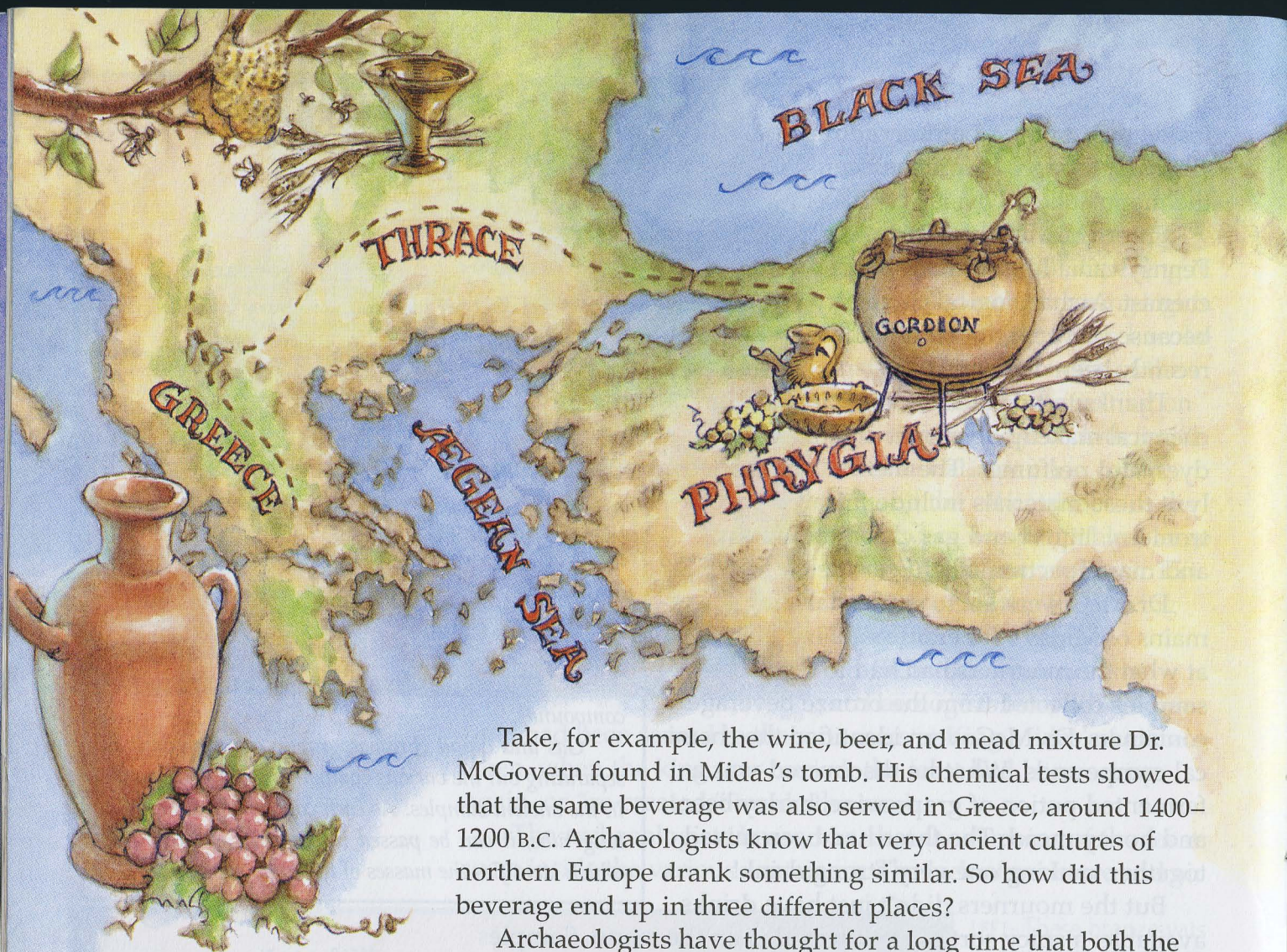


Infrared spectrometry is a method in which infrared light (which is invisible) is passed through the unknown sample. Depending on which chemical compounds and groups are present, the light is absorbed at certain wavelengths. Characteristic absorption spectra (patterns) serve as "fingerprints" for the ancient compounds.

Gas and liquid chromatography are important in separating out the various components and compounds in the ancient samples. As each component comes off a long tube, it can be passed into a mass spectrometer, which identifies the masses of the components.

MEAD IS AN ALCOHOLIC BEVERAGE MADE BY FERMENTING HONEY AND WATER.





Take, for example, the wine, beer, and mead mixture Dr. McGovern found in Midas's tomb. His chemical tests showed that the same beverage was also served in Greece, around 1400–1200 B.C. Archaeologists know that very ancient cultures of northern Europe drank something similar. So how did this beverage end up in three different places?

Archaeologists have thought for a long time that both the Phrygians and some of the Greek peoples originally came from Europe. Since they liked the same sort of mixed drink, the archaeologists believe that this suggests the two groups came from Europe long ago.

Scientists like Dr. McGovern, then, use both archaeology and chemistry to learn more about ancient peoples. Their work helps provide missing pieces to some very old puzzles. And the more we know about past civilizations, the more we understand about life today.

So go ahead and hide that broccoli, lima bean, and tofu casserole at the back of the refrigerator. If your parents ask, tell them it's in the name of science. Someday in the future, archaeochemists will want to analyze what people today ate. You're just giving them a hand by supplying the leftovers. *Mmm!* 