



GROG OF THE GREEKS

They couldn't make a Manhattan or a screwdriver, but Bronze Age boozers could still mix a mean cocktail. Stephanie Pain says thanks, but mine's a martini

REMEMBER the Snowball, that sickly, yellow tippie topped off with a maraschino cherry? Drinks, like everything else, can go out of fashion and the Snowball, thankfully, is just a hazy memory. Go back a few millennia more, though, and you'll see just how much tastes can change. A discovery made this year reveals that the Minoans of Bronze Age Crete and their neighbours on the Greek mainland drank wine, beer and mead—all mixed together in the same cup.

Scholars have always suspected that the ancients had odd tastes. If you believe Homer, wise old Nestor, veteran of the Trojan War, enjoyed a few scrapings of goat's cheese and a dollop of honey in his wine. And Homer might have been right: archaeologists often find little bronze cheese graters in later Greek graves which they think were part of a drinking kit. But until now there has been no good evidence that the Minoans and their mainland neighbours the Mycenaeans knew how to brew beer or mead, let alone mixed them into cocktails.

After painstaking chemical analysis of cups, goblets and pots from all over Bronze Age Greece, there can be no doubt about it.

These sophisticated people produced some of the world's first, and strangest, cocktails. Hidden in the pores of ancient bits of pottery are the chemical signatures of those drinks. "Wine snobs will probably cringe, but for them it was the more the merrier," says Patrick McGovern, an archaeological chemist from the University of Pennsylvania Museum of Archaeology and Anthropology.

The choice of drinks at a prehistoric bar—or more likely at a royal feast or religious festival—was limited, and depended on where you lived. The oldest known wine fermented from grapes dates back 7000 years to a small Neolithic village called Hajji Firuz Tepe in the Zagros Mountains of Iran. The ancient Egyptians were drinking wine and beer 5000 years ago, and in the grapeless north beer was the number-one tippie. Northerners may also have made a type of fruit wine from cranberries or other local fruits, and they made mead, a much stronger drink, by fermenting honey and water. "Any source of sugar was pressed into service," says Andrew Sherratt, an expert in European prehistory at Oxford University.

But what were the Minoans knocking back at parties? For the

Illustrations: Spike Gerrell

past four years Yannis Tzedakis, former director general of antiquities at the Greek Ministry of Culture, and British archaeologist Holley Martlew have been piecing together the culinary secrets of the Minoans and Mycenaeans. As part of the project, McGovern and fellow organic chemist Curt Beck from Vassar College in Poughkeepsie analysed extracts from dozens of pieces of pottery from prehistoric Greece.

The oldest pot, from a Cretan cave, dates back 6000 years to Neolithic times. Others span the Bronze Age, from the rise of the Minoans around 4200 years ago to their fall some 1200 years later. There are pots and storage jars, oddly shaped religious vessels and goblets, some from small villages, some from palaces.

Ancient pottery is a mine of information. Some pots contain crusty residues or tidemarks that can be scraped off and analysed. But even without dried-out dregs, a piece of pottery can provide vital clues. Liquids soak into the tiny pores of a pot, and some organic compounds remain trapped there to survive intact for thousands of years. Some archaeologists are worried that such tiny traces might have been altered over the millennia, perhaps

contaminated by water moving through the soil. McGovern argues that the unseen traces offer more reliable clues. "Often the material in pores is more intact than a nice deposit you can scrape off," he says.

McGovern and Beck put their samples through a battery of tests, from infrared spectrometry and X-ray fluorescence to liquid and gas chromatography and mass spectrometry, techniques that pick out signature compounds specific to the various ingredients that make up alcoholic drinks. These can be checked against known signatures from pots that bear inscriptions describing the drinks they once held. "The results are very consistent," says McGovern.

One of the telltale signs of wine is tartaric acid, a compound abundant in grapes. Resinated wines leave other clues. The ancient Egyptians often sealed wine jars with tree resins—generally from the terebinth tree. At first, resin was used to keep jars airtight to prevent the wine turning to vinegar, but later resins were added as flavourings in their own right, often to mask tastes and smells in poor-quality wines. A group of aromatic hydrocarbons called terpenoids show the presence of tree resins—and the combinations

LAST ORDERS

When it's closing time in this world's saloon, what will you have in the next? Some ancient drinkers had the right idea

THE WINE KING

One of Egypt's first kings, buried at Abydos around 3150 BC, was prepared for an eternity of drinking. When German archaeologists excavated his tomb in 1988, they found three entire rooms had been stacked with wine jars—about 700 of them. Chemical analysis of residues in the jars points to a wine laced with resin from the terebinth tree, imported from Palestine. If every jar was full, the king—possibly called Scorpion I—had more than 5000 litres of the best imported vintages to liven up the afterlife.

HOSTESS WITH THE MOSTEST

In Iron Age Denmark, handing round the drinks at parties was a job for a well-bred woman. The woman buried in the first century AD at Juellinge, on the island of Lolland, was an Iron Age aristocrat, with plenty of silver jewellery. But her family wanted her remembered as a hostess—clearly an honourable position. Buried with her was a whole sheep and a bucket which had contained a drink brewed from barley and cranberries—a mix of crude beer and fruit wine. The woman had everything she needed to attend her guests—drinking horns and glasses and, in her hand, a little sieve for straining any stray bits of husk or fruit skins from the cocktail.

THE PARTY PRINCE

If his grave is anything to go by, the prince buried around 530 BC at Eberdingen-Hochdorf in southern Germany liked a good party. Archaeologists found him laid out in his best togs on a luxurious padded sofa, with a huge bronze cauldron at his feet. Analysis of pollen in the thick, black gunk at the bottom of the pot identified the drink as mead. The stain around the inside suggested that the 500-litre cauldron had been about three-quarters full. A huge iron drinking horn—with a capacity of 5.5 litres—suggested he had an impressive capacity for drink, but he wasn't expected to polish off the lot himself. Eight smaller flagons, made from the horns of aurochs, were there for his friends. And the four-wheeled wagon in the grave? Perhaps it was an early version of the late-night taxi home.

The huge amounts of pollen suggest that the recipe included honey. But there were also husks of wheat, bits of cranberry skin and hairs from the fruits of the bog myrtle—which Danes still use to flavour their schnapps. "It was a mead, a beer and a fruit wine all in one," says Sherratt.

The woman buried at North Mains also had a drink to quench her thirst in the next world, this time in a clay pot. The types of pollen found in the greasy black residue came from both cereal plants and species that bees feed from—a mix interpreted as beer and mead.

To us, it seems positively revolting. So why did they do it? Before the relatively recent invention of distillation—a mere 1500 years ago—alcoholic drinks tended to be weak. "Most drinks were less than 10 degrees proof, so people added things to give them an extra thump," says Sherratt. Some threw in mindbenders such as henbane, opium or mandrake. Others tried combining alcoholic drinks. In the north, mead was the strongest drink you could get, as potent as a decent wine. But it was rare and expensive. "If you started with beer then you could make it stronger by adding mead," says Eva Koch, of the National Museum in Copenhagen.

But the people who lived around the Aegean had wine from very early on, so what would be gained from adding mead or beer? "Wine in ancient times was often very vinegary so you might want to cut it with something else to make it sweet," suggests Martlew. Or they might just have been trying out new recipes. "This was a civilisation that was growing at a great pace so I imagine they experimented with their cuisine and drinks as they did with everything else," says Martlew. McGovern has another theory. He speculates that perhaps some northern people, with their uncouth tastes in drink, moved south, taking their barbaric cocktail recipes with them. Unfortunately, this is a mystery that organic chemistry is unlikely to solve.

What did the Minoan Manhattan taste like? "It's doubtful we'll ever have the recipes," says Martlew. "If they wrote them down, we haven't found them yet." How about experimenting a bit? "I've bought some mead and there's a bottle of retsina and some beer in the fridge waiting . . . but I just can't bring myself to do it." □



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beer. Numerous goblets and conical cups from a cemetery at Armenoi in northern Crete contained an even weirder mix—wine, mead and beer. "We have a good idea of what's going on here," says McGovern. "This is something that's not just wine. It has added extras—grain, fruit and honey."

The team is confident that the ancients really were quaffing some sort of cocktail from these cups, and that the residues aren't just the remains of a succession of different drinks. "So many of them show the same mix," says McGovern. "It's hard to imagine how all of them could have accumulated the same compounds unless the drinks were mixed up at the same time."

These combinations might not tempt 20th-century tastebuds, but they must have something to recommend them. Less direct analysis of ancient dregs suggests that the Bronze Age people of northern Europe had similar tastes to their Greek counterparts. The best evidence that northern people were mixing their drinks even before the Minoans comes from the graves of two women, one buried around 3370 years ago at Egtved on the peninsula of Jutland in Denmark, the other around 3750 years ago at North Mains in Scotland.

The Egtved woman was buried with a bucket made from birch bark. When the grave was excavated in the 1920s, all that was left of the original drink was a sticky brown residue. But that was enough to hint at its contents.

B. Mullenmix, J. Lamb, R. Calvert/Tony Stone

of compounds can pinpoint the type of tree it came from.

Mead leaves distinctive clues, too—in the shape of organic compounds present in honey and beeswax. Beeswax contains an array of long-chain fatty acids, but one in particular, lignoceric acid, is the clincher. Honey itself leaves traces of gluconic acid, often in the form of gluconate salts.

Beer is harder to identify. Occasionally, archaeologists are lucky and find preserved husks from barley or pollen from cereal plants. "It's hard to find any signature compounds for barley," says McGovern. Instead, the chemists look for calcium oxalate, which accumulates in such large amounts in the bottom of both ancient and modern beer vats that it's known as "beerstone".

Large jars from the village at Myrtos Phournou Koryphe, ruins in southern Crete that date back 4200 years, had clearly contained wine, says McGovern.

The wine from the 3700-year-old palace at Monastiraki in central Crete had something extra: it was laced with pine resin. That makes it the earliest known retsina—the wine with the distinctive "turpentine" taste that is still drunk in Greece today.

Beck picked up a hint of something else at Monastiraki too: wine with a distinctly oaky "nose". The telltale clue here is a lactone, a compound so characteristic of drinks aged in oak barrels that it is known as "whisky and cognac lactone". The Minoans were great boat builders and probably had the technology to make barrels, but McGovern suspects the oak flavour in the Monastiraki wine is more likely to have come from the vat in which some barefoot Minoan trod the grapes.

More intriguing than resin-flavoured wines were the mixtures that the Greeks were drinking, both on Crete and at mainland cities such as the great citadel at Mycenae, in the Peloponnese. A famous 3000-year-old drinking vessel from Mycenae, known as the "beer mug" because of its shape, had held both mead and wine—but disappointingly no trace of

