The Brewers of Babylon

Over 4,000 years ago in Mesopotamia, fermented cereal juices enjoyed great popularity. The Sumerian inhabitants are considered to have been skilled brewers of beer. But how much did their ancient brews have in common with the beers of today? To answer this question, **Peter Damerow**, a proto-cuneiform expert at the **Max Planck Institute for the History of Science** in Berlin, studied the annals of ancient Sumer.

TEXT **ELKE MAIER**

It was around 11,000 years ago that humans first ceased their wanderings. They established settlements, raised cattle and took up arable farming. And perhaps even before they baked their first bread, they discovered that water and grain could be combined to make a pleasing and intoxicating drink: beer. So enthusiastic were they about their discovery that some researchers see this as the real reason for settling down: whoever cultivates a field can harvest grain, brew beer and celebrate in convivial style.

In Mesopotamia, the land between the Euphrates and the Tigris, fermented cereal juices enjoyed great popularity over thousands of years. The Sumerians who lived there were familiar with at least nine kinds of beer. They even regarded the beverage as a basic foodstuff: a typical Sumerian meal consisted of bread, soup or porridge, and beer. Ancient depictions show men and women in merry company, drinking through long straws from enormous tankards of beer. Even children enjoyed the brew that, due to its minimal oxygen content and low pH, was safer than easily contaminable drinking water – and it contained vitamins and minerals.

It was the Sumerians who, 1,800 years before the birth of Christ, composed the first hymn of praise to beer, addressed to the goddess Ninkasi, within whose purview the art of brewing fell: "You are the one who bakes the bappir in the big oven (…) you are the one who soaks the malt in a jar; the waves rise, the waves fall. (…) Ninkasi, you are the one who pours out the filtered beer from the collector vat, it is like the onrush of Tigris and Euphrates." For researchers, this text is one of the most important sources explaining how the Sumerians went about brewing beer. But what did the original Sumerian brew taste like? Did it bear any similarity at all to our present beers?

As a mathematician and philosopher, Peter Damerow of the Max Planck Institute for the History of Science in Berlin was fascinated by these questions. In his last scholarly article, the versatile researcher, who passed away in November 2011, turned his full attention to the brewing skills of the Sumerians. It was

These 5,000-year-old tablets from Mesopotamia are some of the oldest writings in the world. The scribe recorded, among other things, the raw materials needed to make beer.

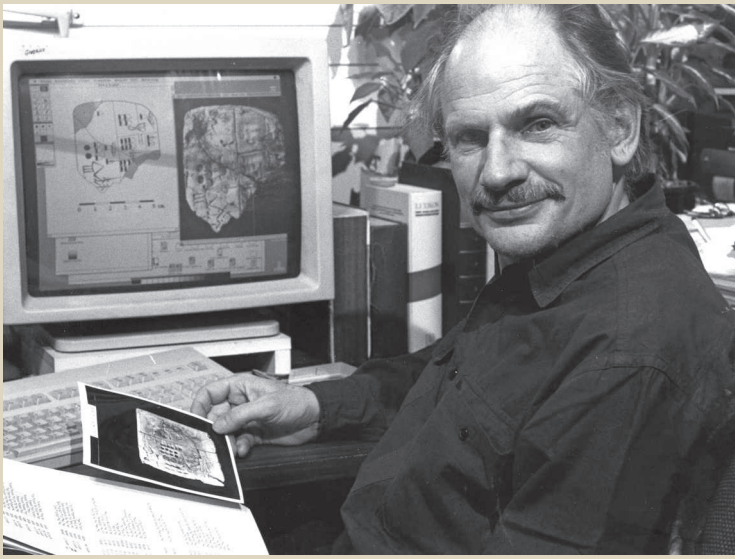
his love of numbers, or more precisely his fascination with how mathematical thought has developed, that drew him to this offbeat subject.

To discover which teaching methods were used to communicate mathematics, Damerow enthusiastically combed through old school books. And in his limitless pursuit of knowledge, at some point he came upon the earliest numerical notations left behind by man. They were inscribed on 5,000-year-old clay tablets unearthed by archaeologists in the southern Mesopotamian city of Uruk. These small yellowish brown tablets were crisscrossed with a complex system of characters known as proto-cuneiform. These characters did not represent phonetic values, as the later cuneiform script did. The early scribes had to make do with symbols representing what they wished to express, such as stylized animal heads, jugs for various liquids, or even entirely abstract characters. The tablets were decorated with more than a thousand different symbols – a baffling Babylonian riddle that taxed the brains of those who studied this ancient society. Even the system used for counting in those days was largely unknown.

Peter Damerow, too, was one of those held in thrall by the mysterious characters scratched thousands of years ago with a stylus pressed into soft clay; he waxed lyrical even about the sheer aesthetics of the tablets. In 1982 – while still working at the Max Planck Institute for Human Development – he began a fresh analysis of more than 5,000 tablets together with the archaeologist Hans J. Nissen and Robert K. Englund, a scholar of the ancient orient.

In their ambitious project, the researchers eschewed previous methods of deciphering the symbols on the basis of individual tablets. Instead, they chose a comparative approach in order to gain some understanding of the "rules of the language." This could be done only with the aid of technology. An article that appeared in

Photo: M. Nissen



In the 1980s, Peter Damerow used computer technology – which was then still a very young field – to aid him in studying the clay tablets found in Mesopotamia. This project turned the versatile researcher on to a new focus for his roving interests: the Sumerian art of brewing.

the Max-Planck-Spiegel in 1990 reported that, "In evaluating these archaic sources, the most modern tool of information technology played a central role: the computer."

Using sophisticated programs developed by Peter Damerow, the scientists ultimately succeeded in deciphering the 60 numerical characters. In doing so, they opened a window on the ancient orient: The clay tablets contained detailed information concerning economic administrative processes recorded for posterity by Mesopotamian bureaucrats. The issue of seeds, supplies of grain and the buying and selling of sheep were all recorded in minute detail.

The researchers discovered that the authors were not using a uniform numerical system – possibly because they were unfamiliar with the abstract concept of numbers. In its place, they used various numerical concepts, depending on what they were counting. One of the most frequently occurring characters had a value of 10 when counting sheep, 6 when counting measures of grain, and 18 when referring to the area of a field. No wonder, then, that deciphering this system was a "breakthrough in research," as Damerow described it.

It was also the bookkeepers of the ancient Orient who inspired today's researchers with enthusiasm for their country's beer culture. Recorded in precise detail on the tablets are countless lists of stores, including, for example, how much barley was delivered or released. There were also detailed lists of how much malt or crushed barley was required to produce a given quantity of beer. Could it be possible, on the basis of this information, to reconstruct the ancient recipes and revive the beers of old?

Brewing expert Martin Zarnkow of the Technische Universität München has given it a try. Taking as his guide the quantities recorded on the clay tablets and the descriptions in Ninkasi's hymn to beer, together with cuneiform expert Walther Sallaberger and archaeologists Adelheid Otto and Berthold Einwag, he set to work. In their laboratory experiments in Weihenstephan, north of Munich, the scientists also took account of the technologies available in ancient times.

Frankfurter Allgemeine Zeitung, June 29, 2001

» The tablets are valuable reminders of a world that has long since disappeared (…) VAT 4874, for example, a text found in southern Iraq dating from around 2,370 B.C., describes the issue of three different types of beer to the palace of Lagash and the temple of the goddess Nanshe. «

For example, the Sumerians didn't dry their malt over a fire as we do today. Instead, they spread it out on rooftops exposed to the sun. Hops were also unknown to the Sumerians. The experimental reconstructions yielded beers that would be the ruination of bar owners today: they tasted sour, with little carbon dioxide and a low alcohol content.

But do these retro-beers truly reflect their ancient predecessors? This was precisely the question that Peter Damerow sought to answer. Until the end of his life, he devoted his attention to the oldest written records left by mankind. Together with Robert K. Englund in the late 1990s, he launched the Cuneiform Digital Library Initiative (CDLI), an Internet platform that constitutes the world's most important digital cuneiform repository. In his 20-page article entitled *Sumerian Beer: The Origins of Brewing Technology in Ancient Mesopotamia*, which appeared in November 2011, Peter Damerow drew on every available ancient source to pinpoint the brewing skills of the Sumerians. His studies embraced not only the hymn to beer and administrative records, but also the residues found in ancient clay vessels. These residues contained traces of yeasts and oxalate, indicating that they had been used for brewing.

He concluded that whatever was fermenting in the Sumerian vessels remains largely shrouded in darkness. It would seem certain that the inhabitants of the land between the Tigris and Euphrates used mainly barley and emmer, a type of wheat, to brew their beer. But in Damerow's opinion, the processes they employed cannot be reproduced in detail. The information on the clay tablets is too imprecise a guide to the recipes. It is also of little help that translations of the ancient texts are, to some extent, ambiguous. We can't even be sure that the brew that was then so popular actually contained alcohol. It may possibly have had more in common with the bread-based beverage kvass that is popular in Russia than with modern beers.

However, the expert brewers of Weihenstephan have not given up: Using a new translation of the hymn to Ninkasi that is due to be published shortly, they intend to continue their experiments to discover the secrets of their ancient Sumerian colleagues. So the possibility cannot be entirely excluded that we will one day be able to order an "Original Sumerian," brewed in accordance with the purity laws and practices of 3,000 B.C. As it happens, Peter Damerow himself was no great lover of beer. He preferred the occasional glass of good red wine.

Photo: Hübke