



mummy
tooth
decay



headgear
from the
1980s



Horse teeth
were once
used to make
dentures.



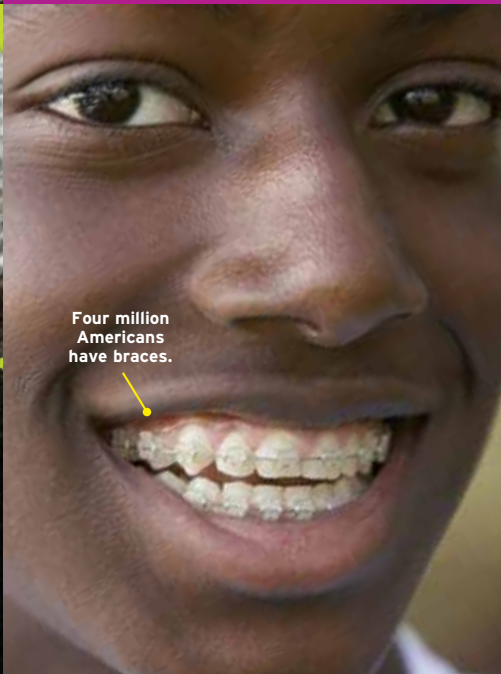
Katy
Perry's
tooth
bling cost
more than
\$1,000.



In some ancient cultures,
moms swallowed their
kids' baby teeth.



George
Washington had
only one tooth
when he became
President.



Four million
Americans
have braces.



ancient
"grill"

The totally gruesome, totally fascinating HISTORY of TEETH

By Kristin Lewis

AS YOU READ How has dental care changed over time?

How did the mummy die? This is what researchers wanted to know as they studied the mummified body of a woman they called Djed. They knew she had lived more than 3,000 years ago along the Nile River in Egypt. She'd had a job playing music and was married. And somehow, when she was about 30, Djed had died. Had she been bitten by a cobra? Killed by malaria? Attacked by a crocodile lurking near the river? The answer was surprising. Djed died of a bad tooth. In 1994, scans of Djed's skeleton showed a tooth that had never grown in. Over time, it created a hole that filled with stinky, yellow pus. Such an infection could easily be cured with antibiotics today. But the only treatment available to Djed was to have holes drilled

in her jaw to drain the goo. Scientists believe that in the end, the infection in Djed's mouth got into her bloodstream, which led to her death.

Terrible Fact of Life

Today, dying from a bad tooth is extremely unlikely in the U.S. Proper brushing and flossing as well as regular visits to the dentist can prevent or cure most serious dental ailments. Yet for most of human history, tooth problems were a terrible fact of life. Ancient Spartan warriors would charge into battle with oozy abscesses in their gums. High-society women in 18th-century France would politely cover their rotting teeth with hankies when they smiled. George Washington had only one tooth left by the time he became President—a fact that bothered him greatly. Tough cowboys of the American West would



(left to right, top to bottom): Ira Block/National Geographic/Getty Images; John Steel/Shutterstock.com; Ana Blazic Pavlovic/Shutterstock.com; Jamie McCarthy/Getty Images for MTV; Sebastian Kaulitzki/Alamy Stock Photo; Horse Crazy/Shutterstock.com; The Print Collector/Hulton Fine Art Collection/Getty Images; Monkey Business Images/Shutterstock.com; Photo illustration by Allan Davey/Carve/Alamy Stock Photo

weep openly as their diseased teeth were yanked out with pliers—often with little more than a few gulps of whiskey to dull the searing pain.

The journey to modern dentistry may seem like a horror movie. It features a colorful cast of characters—**charlatans** and villains, misguided surgeons and curious scientists—and many bizarre treatments that often hurt patients more than they helped. Yet it's also a story of human ingenuity and the triumph of science over **superstition**.

Cat Intestines

Until the 20th century, most people had crooked and yellowed teeth. Many lost most or all of their teeth by the time they were middle-aged. As you might expect, people were always looking for ways to

WHAT MUMMIES TELL US

Teeth last longer than any other part of the skeleton, thanks to the hard enamel that encapsulates them. Experts have learned a lot about ancient dentistry by studying the teeth of mummies.

ease their suffering and make their teeth look better.

Some dental treatments of the past would seem strange to us now. Throughout history, people believed that toothaches were punishments from God or were the work of evil spirits. To scare away tooth-destroying demons, people might have kissed a donkey or walked around a barn three times while trying not to think about a fox.

On the other hand, some ancient procedures were quite **sophisticated**—and not



Djed's coffin

Royal Ontario Museum (coffin)

so different from what we do today. The Romans, for instance, understood that teeth needed to be replaced when they fell out. So they used bone, wood, or ivory to create fake teeth similar to the dentures people wear now. In ancient Egypt, people tried to close up gaps between teeth using gold bands or cords made from cat intestines, kind of like modern-day braces.

In fact, both ancient Rome and ancient Egypt were relatively **advanced** when it came to dentistry. But much of this knowledge was lost over time.

Worms in Your Teeth?

Today, the most common tooth problems are cavities. Cavities form when certain types of bacteria make acids that eat away at our teeth and form holes.

These holes are painful and can get infected if left untreated. Good hygiene helps prevent cavities but some people are particularly **prone** to them, no matter how much they brush and floss.

Cavities were a major source of dental troubles in ancient times too—including when Djed lived. But ancient peoples were **baffled** by what caused them. For centuries, people in many parts of the world thought that cavities were caused by small maggot-like creatures they called “toothworms.” (It's an understandable mistake; the pulpy center of our teeth *does* resemble worms.)

The recommended cures for toothworm and other toothaches were rather horrifying. You might have burned an inflamed tooth with acid or placed lice into your

cavities. Rinsing with the first urine of the morning was another common treatment for tooth pain. While this likely did nothing for cavities, it may have whitened teeth, because urine contains a whitening chemical called ammonia.

Gaping Wounds

By the 1700s, a new crop of dentists was rising. Their work was based more on science than superstition. Over the course of the 18th and 19th centuries, they would invent special tools to better examine the mouth and remove problem teeth. They would **hone** new techniques and train others to perform them.

If you had grown up in this time, though, you would probably have lived your whole life without ever seeing one of



Teeth Through Time

Humans have been trying to fix their smiles for thousands of years.



SUGAR PROBS

Scientists believe humans had few dental problems before people started farming grains like wheat and corn, about 10,000 years ago. That's because grains break down into sugar, which causes cavities.

PIG BRUSH

The bristle toothbrush was invented in China in 1498. The bristles were made of hair from the back of a hog's neck. Today's bristles are made of nylon.



EARWAX FILLINGS

In ancient times, people filled cavities with such materials as silver, earwax, and mashed-up bird brains. There is also evidence that ancient peoples drilled cavities by twisting sharpened stones into teeth. (Ouch.)

LADYBUG MUSH

People have always needed ways to relieve tooth pain. Ancient Peruvians used coca leaves. Ancient Hebrews used salt. In 18th-century Italy, people used crushed-up ladybugs.



TOOTH SNATCHERS

In 1800s America, body snatchers followed armies into battle and returned with bags of teeth taken from dead soldiers. They sold these teeth to dentists, who implanted them into the mouths of the wealthy.



these fancy new dentists. There were very few of them around, and they were expensive.

Instead, you'd likely have gone to your local barber. Back then, barbers did a lot more than cut hair; they also performed surgery.

Your barber would have yanked out your bad tooth with pliers—a miserable and risky procedure. There weren't many ways to dull the pain, and serious infections from the gaping wounds left behind were common. What's more, barbers sometimes broke people's jaws while pulling teeth.

If you didn't take your tooth troubles to your barber, you might have sought the help of a traveling "tooth drawer." These men went from town to town across North America and

Europe, pulling bad teeth for a small fee.

Some tooth drawers were well-meaning but inexperienced. Others were outright con artists looking to make a quick buck. They'd show up to a town claiming they could pull teeth painlessly—which, of course, they couldn't. Sometimes they traveled with musicians who would play loudly to drown out people's screams. Then the tooth drawers would ride off into the sunset, leaving their "patients" to deal with bleeding gums, fractured jaws, infections, and facial disfigurements.

Tiny Robots

By the 19th century, people understood that cavities were not the work of toothworms or evil spirits. Dental schools sprang

up across Europe and the U.S. New laws requiring dentists to be licensed put the con artists out of business. By the 1950s, professional dental care was widely available. And in the following decades, Americans became increasingly obsessed with their teeth.

Today, some 300,000 hygienists, dentists, and orthodontists work in the U.S. These highly trained professionals have powerful X-ray machines to spot problems, precision tools to clean teeth and gums, **anesthetics** to treat pain, and braces to straighten teeth.

Modern dentistry is arguably one of humanity's greatest achievements—and it's still changing. Exciting new technologies will surely be developed in your lifetime.

Soon, your dentist may be able to use 3-D printing technology to make custom replacement teeth in mere seconds. Our toothbrushes could be replaced with smartbrushes that scan our teeth, plug into our phones, and tell us if we have problems. Synthetic materials may enable our teeth to heal themselves, and microscopic robots may one day straighten and clean our teeth for us.

Sadly, modern dentistry wasn't around to help Djed. But thousands of years from now, if scientists ever study our bodies, it is doubtful they will discover that any of us died from a bad tooth. ●

MGM Studios/Getty Images (Judy Garland); razyph/23RF.com (braces)

Chris Condon/US FGA TOUR/Getty Images (dentist); EcoMedia (bus)



HOLLYWOOD SMILES
Americans' obsession with good-looking teeth started after World War II, when dental and orthodontic care became more affordable. People wanted smiles as bright as those of their favorite Hollywood stars, like Judy Garland (above).

BRACES NATION
Today, 4 million Americans have braces. Clear braces are made from a material that was originally developed by NASA!



Where Are All the Dentists?

Millions of Americans don't have access to dental care.

But this problem can be solved. **By Kristin Lewis**

We are very lucky to live in the age of modern dentistry. With regular trips to the dentist and daily flossing and brushing, our teeth and gums can stay healthy for many years. And it's not just our smiles that benefit. Studies show that taking care of our teeth lowers the risk of developing certain health issues, such as heart disease, later in life.

Yet right now, millions of Americans don't have access to a dentist. What's more, one in seven kids between the ages of 12 and 19 have at least one untreated cavity, according to the Centers for Disease Control and Prevention.

Clearly, inadequate dental care is a major issue. The good news is that many dedicated people are working to solve this terrible problem.

Dental Deserts

Many Americans can't go to the dentist because of the cost. The average price of an exam and a cleaning is about \$100. That can be a financial burden, especially for those without insurance. Yet the price of not getting regular cleanings can be much higher. When tooth issues go untreated, surgery may be required down the road. And dental surgery can cost thousands of dollars.

There is another reason some Americans do not go to the dentist. In some parts of the country, especially rural areas, there are almost no dentists to go to. People in these "dental deserts" must travel long distances for an appointment, which is inconvenient and expensive.

So why don't dentists simply go work in these areas? Dental school has a hefty price tag, and many dentists graduate with debt. To pay off this debt and earn a good living, they need to treat a lot of patients. So they go to urban and suburban areas, where a lot of people live.

How to Solve the Problem

Fortunately, the problem of dental deserts can be solved. Across the country, people are starting mobile dental clinics that travel to remote and underserved places. Dentists and hygienists work in these clinics providing cleanings, X-rays, and other important services at reduced cost or for free.

In Mississippi, for example, an organization called Smiles to Go sends dental professionals into schools. In Colorado, the Miles for Smiles clinic hits the road in a brightly colored bus with an entire dentist's office inside.

Hopefully, such traveling dental clinics will result in more people flashing bright, healthy smiles. In the meantime, though, more needs to be done so that everyone can get the dental care they need. ●

A mobile dentist's office in California



A mobile dental care bus in Colorado

Writing Contest

How has dental care changed over the centuries? What challenges do we still face today? Answer both questions in a well-organized essay. Send your essay to **Teeth Contest**. Five winners will each get *Smile* by Raina Telgemeier. See page 2 for details.

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