

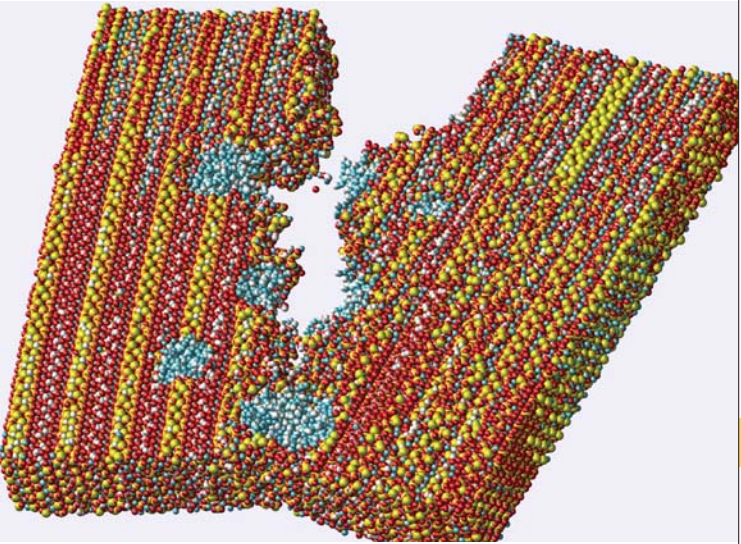
#WONDERS

LEARNING FROM ROMANS

Tobermorite forms in layers, like paper stacks that solidify into particles. These particles often have screw dislocations, shear defects that help relieve stress.



Rouzbeh Shahsavari.



Computer models of tobermorite, a key element in the superior concrete Romans used in ancient times, suggest how to make modern concrete that's less likely to crack under stress.



Researchers performed an atom-level computer analysis of tobermorite, a naturally occurring crystalline analog to the calcium-silicate-hydrate (C-S-H) that makes up cement, which in turn holds concrete together.

Their results appear this week in the journal *ACS Applied Materials and Interfaces*. Tobermorite forms in layers, like paper stacks that solidify into particles. These particles often have screw dislocations, shear defects that help relieve stress by allowing the layers to slide past each other. Alternately, they can allow the layers to slip only a little before the jagged defects lock them into place.

The researchers built the first computer models of

tobermorite 'super cells' with dislocations either perpendicular to or in parallel with layers in the material, and then applied shear force. They found that defect-free tobermorite deformed easily as water molecules caught between layers helped them glide past each other.

But in particles with screw defects, the layers only glided so far before being locked into place by the tooth-like core dislocations. That effectively passed the buck to the next layer, which glided until caught, and so on, relieving the stress without cracking.

Defects aren't a weakness

This 'step-wise defect-induced gliding' around the particle's core makes it more ductile and able to adjust to stress, says Rouzbeh Shahsavari, an assistant professor of civil and environmental engineering and materials science and nanoengineering at Rice University.

"The insight we get from this study is that unlike the common intuition that defects are detrimental for materials, when it comes to complex layered crystalline systems such as tobermorite, this is not the case," says Shahsavari. "Rather, the defects can lead to dislocation jogs in certain orientations, which acts as a bottleneck for gliding, thus increasing the yield stress and toughness. These latter properties are key to design concrete materials,

which are concurrently strong and tough, two engineering features that are highly desired in several applications.

"Our study provides the first report on how to leverage seemingly weak attributes, the defects in cement and turn them to highly desired properties, high strength and toughness," Shahsavari says that he hopes the work will provide design guidelines for developing stronger, tougher concrete and other complex materials. Postdoctoral researcher Ning Zhang is lead author of the paper and Philippe Carrez, a professor at the Lille University of Science and Technology, Villeneuve d'Ascq, France, is a coauthor. The National Science Foundation supported the research.



The burger wasn't just a fast meal; it became a symbol of American identity and ingenuity, evident in its evolution and innovation. People began to seek out unique flavor combinations, inspiring a tradition of culinary creativity that's still thriving today. Classic beef burgers were diversified with the introduction of new toppings and sauces, expanding the burger's appeal beyond its humble beginnings. Food enthusiasts started venturing to try from the traditional cheddar and lettuce to more adventurous additions like blue cheese and avocado.



Verna Mohon

Imagine biting into a juicy patty, its flavors bursting forth with a comforting familiarity and delicious complexity. As you chew, you may find yourself transported through time, paying homage to the humble beginnings that have evolved into today's culinary masterpiece.

The Humble Beginnings of the Burger

The humble beginnings of the burger can be traced back to the modest sandwich, often seen as America's quintessential comfort food. In the early 19th century, the invention of the sandwich by the British may well be considered a pivotal moment. As folks immigrated to the United States, they brought with them their culinary traditions. The sandwich, versatile and comforting, became a staple. Over time, creative cooks introduced cooked meats into sandwiches. German immigrants, with their beloved Hamburg steak, laid the foundation for what we now recognize as the classic burger. Ground beef patties were eventually tucked between slices of bread or buns, evolving slowly but surely into the burgers we cherish today. Alongside this evolution, deli meats, such as pastrami, played an integral role in shaping American

comfort food culture. Pastrami, with its rich, smoky flavor, often found its way into hearty sandwiches, adding layers of taste and texture. The interplay between sandwich fillings expanded, offering a plethora of options that tantalized taste buds and satisfied diverse palates. As the burger started to gain traction, so did the experimentation with toppings and condiments, further diversifying its appeal. Today, you can find an array of gourmet burgers that celebrate this delightful culinary journey, a testament to innovation. And speaking of pastrami, many burger aficionados find that a slice of this deli favorite can elevate their burger experience. So, next time you're crafting or ordering your perfect burger, think about how these humble beginnings have paved the way for the delicious creations you enjoy now.

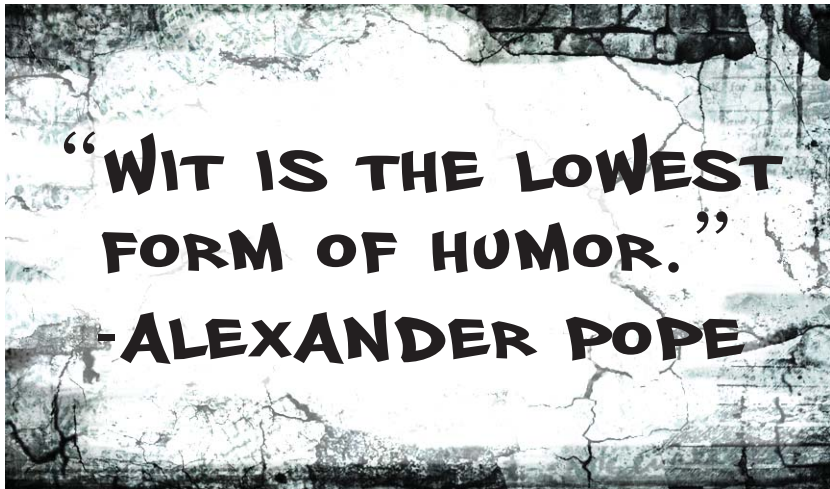
The Burger Boom: Rise to Fame

Throughout the mid-20th century, the allure of the burger soared, intertwining itself with quintessential elements of American culture. The post-World War II era was characterized by an economic boom and a burgeoning middle class eager for both convenience and new dining experiences. Drive-in restaurants and diners, which had been sporadically popping up before, saw a substantial increase in popularity. Chains like McDonald's and White Castle became household names, their widespread success fueled by the efficiency of mass production and the appeal of quick, satisfying meals. These establishments capitalized on the burgeoning car culture, allowing people to enjoy their favorite American comfort food without stepping out of their vehicles. Additionally, television became a prominent medium where these fast food giants advertised their tasty delights, embedding the burger deeper into American consciousness.

During this era, the burger wasn't just a fast meal; it became a

symbol of American identity and ingenuity, evident in its evolution and innovation. People began to seek out unique flavor combinations, inspiring a tradition of culinary creativity that's still thriving today. Classic beef burgers were diversified with the introduction of new toppings and sauces, expanding the burger's appeal beyond its humble beginnings. Food enthusiasts started venturing to try from the traditional cheddar and lettuce to more adventurous additions like blue cheese and avocado. Moreover, the allure of burgers was not confined to traditional beef alone. Variants with chicken, turkey, and even plant-based patties began to make appearances, showing the versatility and ever-expanding nature of this American comfort food. This burst of creativity further cemented the burger's status as an adaptable staple in American dining, giving birth to gourmet options and unique fusions that continue to shape the comfort food history in our kitchens and restaurants today.

THE WALL



BABY BLUES



Caesar Salad needs a celebration

Anyone who has ever had a traditional Italian meal or been to an Italian restaurant knows this delicious salad mix referred to as Caesar Salad. Comprised of romaine lettuce and croutons with a delicious blend of parmesan cheese, egg, garlic, black pepper, Worcestershire sauce, and lemon juice (and, in some cases, anchovies), many people feel that this salad is something akin to heaven in a bowl. That's why National Caesar Salad Day came to pass, to celebrate this delicious blend of foliage and seasonings! The best way to celebrate this day is to make sure to eat a traditional Caesar Salad, in the traditional style!

Moreover, the allure of burgers was not confined to traditional beef alone. Variants with chicken, turkey, and even plant-based patties began to make appearances, showing the versatility and ever-expanding nature of this American comfort food. This burst of creativity further cemented the burger's status as an adaptable staple in American dining, giving birth to gourmet options and unique fusions that continue to shape the comfort food history in our kitchens and restaurants today.



Regional Variations: The Burger Across America

Now, let's explore the regional variations that make the burger a canvas for local flavors across America. In the Midwest, for example, you'll find the famous Juicy Lucy, a burger that hides a molten core of cheese within the patty itself. Cutting into this burger releases a gooey cascade of melted goodness that perfectly complements the warm beef. Move a bit to the East, and you can savor a New York burger often topped with pastrami, bringing a smoky, peppery flavor contrast that feels quintessentially deli-inspired. Head down to Texas where the influence of BBQ reigns supreme, and you'll encounter burgers topped with grilled onions, jalapeños, and a generous lathering of smoky barbecue sauce. These burgers capture the spirit of the Lone Star State with their bold flavors. And don't get me started on California! The West Coast's love for fresh, organic ingredients shines through with burgers featuring avocado, sprouts, and even aioli, giving them a lighter, modern edge. It's a testament to American culinary diversity that your humble burger can transform based on the area's palate.



Yet, regional differences don't just stop at toppings; even the way burgers are cooked varies significantly. In the South, you might find your burger cooked on a flat-top griddle, yielding a crispy, caramelized crust that's incredibly satisfying, reminiscent of a diner-style smash burger. In contrast, burgers from the Pacific Northwest might be grilled over an open flame, infusing them with a smoky aroma that enhances their flavor profile. In Kansas City, known for its barbecue heritage, it's not uncommon to find burgers slathered with tangy, slow-cooked barbecue sauce and topped with a

The Burger in Modern Cuisine: Gourmet and Beyond

As we journey further into modern cuisine, the burger has ascended to gourmet heights, delighting food enthusiasts with inventive spins and high-quality ingredients. These upscale versions are no longer confined to just the patty and bun, today's gourmet burgers are culinary masterpieces. Chefs are now utilizing artisan buns, whether it's a brioche bun that adds a buttery richness or a pretzel bun that offers a delightful chewy texture. The meat itself, the heart of the burger, is often sourced from grass-fed, organic cattle, ensuring a depth of flavor and tenderness that stands out. For those with a

penchant for seafood, the introduction of salmon and ahi tuna patties provides a luxurious alternative. Plant-based options, too, have seen a renaissance, with patties made from a blend of chickpeas, black beans, and even quinoa, providing a hearty, flavorful bite that caters to vegetarians and vegans alike. In terms of toppings, the sky is quite literally the limit. Think foie gras, truffle aioli, or even a fried egg with a gooey yolk that bursts forth, creating a lush, savory sauce that melds beautifully with each component of the burger.

make a concoction of water, aloe vera juice, and avocado oil. Keep it on hand to spritz whenever a bit of moisture and/or control is needed. Another good option is argan oil mixed with water.

#BEAUTY

Summer Hair Care

Keep your hair happy and healthy all summer long using natural, chemical-free methods.



Natural hair rules in the summer! Now is the season to let go of perfect, sleek hairdos and embrace that loose, natural look. Learn how to protect your hair from the heat, sun, and humidity without turning it into an endless battle.

Use a scarf or hat to cover your head when you're out in the sun. Not only does this provide extra UV protection, but it also helps your scalp to retain moisture. A hat reduces damage caused by wind, especially if your hair is prone to tangling, and protects colour-treated hair.

2. Put your hair up in loose, comfortable styles

A messy braid is ideal for keeping your hair under control and minimizing exposure to the sun. Tight hairstyles can be damaging because they tend to pull and tear hair, especially if your hair is dry from the summer heat.

3. Wash less often

Frequent washing strips your scalp of its natural oils, which in turn stimulates additional oil production and makes you feel the need to wash it even more. Try just rinsing in the shower after a day at the beach or pool, and see if that gets rid of

some extra oil. Use a homemade or natural dry shampoo, such as cornstarch, in place of regular shampoo to go a bit longer without washing. Another quick fix is to dab a cotton ball soaked in witch hazel along your scalp to dissolve excess oil.

4. Reduce the heat



Try to blow-dry your hair as little as possible. It is already exposed to a significant amount of heat on a daily basis in the summer, and it will probably air-dry quickly anyways, so give the blow

dryer a break and go au naturel if you can. Avoid flat-irons, too, as they will do further damage to already-dry hair. Plus, a sleek hairstyle only makes that frizz stand out more.

5. Spritz & Seal



Make a concoction of water, aloe vera juice, and avocado oil. Keep it on hand to spritz whenever a bit of moisture and/or control is needed. Another good option is argan oil mixed with water.



6. Try a hot oil rinse

Coconut, olive, and avocado oils are good at penetrating the hair shaft. Shampoo hair as usual, then work in oil from ends to roots. Rinse, then condition as usual. Your hair should feel moisturized afterwards, but not greasy.

7. Condition always



Rinse with apple cider vinegar diluted in water for a quick natural conditioner. Use some coconut oil or shea butter (careful with this, since it can be heavy) to smooth, de-frizz, and moisturize your locks after washing. The oil will give some shine and, if you have wavy hair, create natural, air-dried curls. Try a natural deep conditioning treatment once a week to get that extra bit of moisture into your hair.

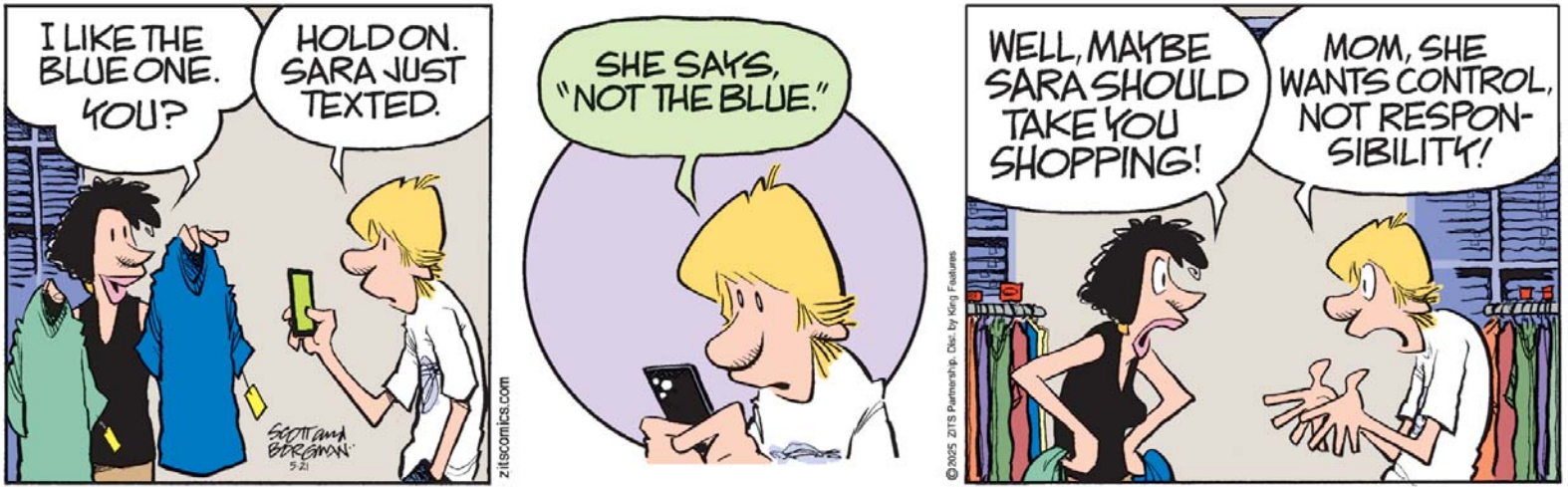
8. Use a wide-tooth comb instead of a brush



Avoid pulling anything through your hair when it's wet, since that's when it's most susceptible to breaking. Wide-tooth combs are most gentle for untangling hair, as brushes can pull and tear when they snag strands.

By Rick Kirkman & Jerry Scott

ZITS



By Jerry Scott & Jim Borgman