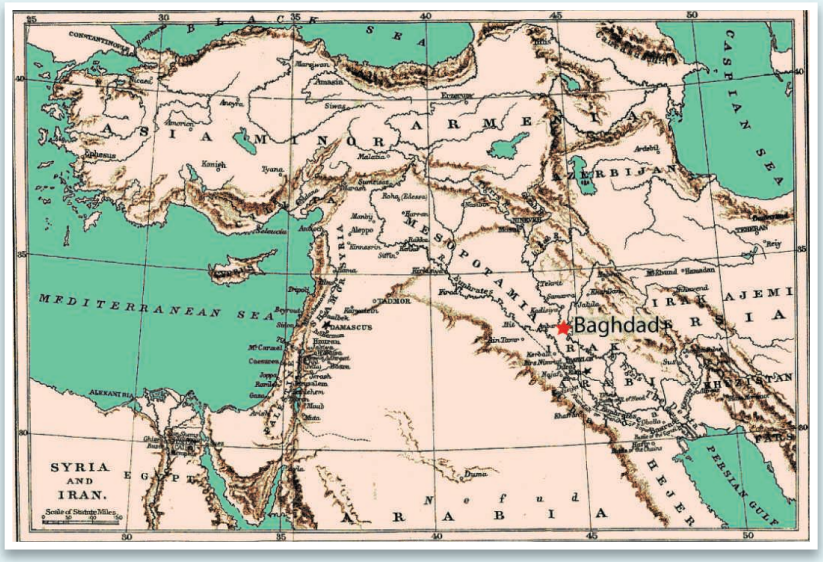
Random Sample

A Cold July in Baghdad

Researchers in Spain are tapping a new database in their search for historic climate patterns: medieval Arab history. Physicist Fernando Domínguez-Castro of the University of Extremadura in Badajoz, Spain, and his colleagues, including a historian of Arab culture, examined references to droughts, floods, and hail in ten Arab sources written between 816 C.E. and 1009 C.E.. One text told of nights during a Baghdad summer that were so cold that residents bundled up inside their homes rather than sleeping on roofs as was the custom, the team reported in *Weather.*



The texts, the team concluded, suggest that 10th century Baghdad had more cold spells than it does now. That conclusion agrees with previous hemisphere-wide temperature reconstructions by climate scientists—but it's the first time this has been demonstrated for Baghdad.

Understanding how global climate trends play out close to home is a priority for many climatologists. Yet extracting useful climate information from medieval records will require trust and cooperation between researchers with little in common. "People are reticent," Domínguez-Castro says of the historians closest to medieval archives. "They think, 'These crazy physicists are here to steal my job.' "

Still, the large geographic and historic span of Arab record-keeping is attracting funding from Spanish and German research organizations. Comparing historical records from German monasteries with those from Andalusian courts might also generate fresh insights. "Most climate reconstructions are from the north of the Mediterranean," Domínguez-Castro explains."The southern Mediterranean is climatically very interesting but also very little studied."

FINDINGS

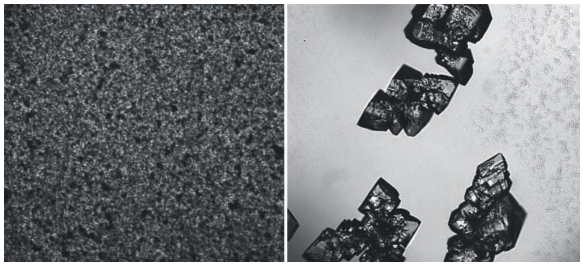
Genetically Engineered Bacteria Could Help Fight Climate Change

Some researchers believe that capturing atmospheric CO_2 and trapping it in buried rocks could lower the risk of catastrophic climate change. Now researchers have found that bacteria can speed that process up.

CO_2 pumped into underground rocks combines with metal ions in the salty water that fills the rock pores and mineralizes into mineral carbonates such as calcium carbonate ($CaCO_3$). That can take thousands of years. To see if they could speed things up, biochemist Jenny Cappuccio and colleagues at the Lawrence Berkeley National Laboratory's Center for Nanoscale Control of Geologic CO_2 put a mix of common bacterial species in a calcium chloride solution in the lab and pumped in CO_2. They found that calcium carbonate formed faster where the bacteria were living than in sterile solutions.

The team guessed that the surfaces of the bacteria were helping the CO_2 hook up with calcium ions. They modified one of the bacterial species, *Caulobacter vibrioides*, inserting a sequence of DNA that reshaped the bacteria's surface to attract calcium ions.

It worked. When the researchers pumped CO_2 into the tanks where the modified bacteria were living, even more $CaCO_3$ solidified than in tanks with unmodified bacteria. Cappuccio reported the team's results 26 February at a meeting of the Biophysical Society in San Diego, California. **http://scim.ag/CO2gen**



Taking shape. Initially amorphous in sterile solutions (*left*), calcium carbonate quickly forms crystals (*right*) when bacteria are present.

CREDITS (TOP TO BOTTOM): FERNANDO DOMÍNGUEZ-CASTRO *ET AL.*, *WEATHER* **67** (27 FEBRUARY 2012); JENNY CAPPUCCIO/LAWRENCE BERKELEY NATIONAL LABORATORY

BY THE NUMBERS

149 Potential sources of human error in fingerprint analysis, according to a National Institute of Standards and Technology report.

198 kg of CO_2 The estimated carbon footprint—equivalent to burning 90 liters of gasoline—of a shrimp cocktail made with shrimp grown in former mangroves, according to ecologist Boone Kauffman of Oregon State University, Corvallis, reporting at February's AAAS meeting.

Science LIVE

Join us on Thursday, 8 March at 3 p.m. EST for a live chat on the **Science of Forensics**. How are researchers helping police solve tough crimes? **http://scim.ag/forensiclive**

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