Hampshire Life
THE GAZETTE'S WEEKLY MAGAZINE FOR THE PIONEER VALLEY

Mike Baer, last of the Indian Motorcycle craftsmen

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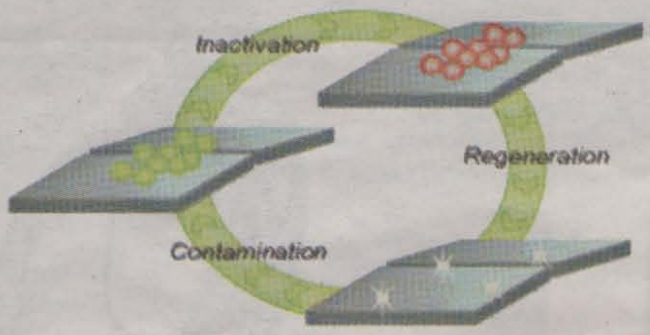

Courtesy of Julie Goddard

This diagram shows the cycle of bacteria contamination on a food processing surface and the regeneration that occurs when it is rinsed with bleach. Applying a super-thin anti-microbial layer designed by UMass food scientist Julie Goddard and to the surface could pump up the sanitizing properties of bleach and improve food safety.

director of the Michigan State University School of Packaging, is now researching how many bleach rinses the anti-microbial layer can undergo before its chlorine-gripping quality is diminished.

Ancient flood changes direction

During a warm period about 8,200 years ago, the Laurentide ice sheet, which covered some 1.5 million square miles of arctic Canada, began to melt.

These meltwaters pooled into a large glacial body of water, Lake Agassiz, which was buffered by an ice dam (a mega-sized version of the dams that damaged so many roofs this winter). When the water broke through the kilometers-long ice dam at the bottom of the bay, thousands of cubic kilometers of fresh water gushed into the Atlantic Ocean.

For years scientists believed the flood stayed north, serving as a contributing factor to the largest abrupt climate change recorded in the last 10,000 years — a sudden freeze. Many assumed the fresh water coated the Labrador and Greenland seas as well as the subpolar gyre (a large area of circulating ocean currents) with lighter, less salty water, triggering cooling. This in turn slowed the Gulf Stream and ocean currents, further adding to cooling in the Northern Hemisphere.

But according to research by Alan Condron, a UMass geoscientist, and Peter Winsor, a geoscientist at the University of Alaska, that's not what happened. The flood traveled in another direction.

"Climate scientists have, for some years now, thought that this water would have flowed very far north in the ocean and that it was capable of slowing down the circulation of the ocean enough to cause climate change," Condron said. "However, I have found that the meltwater would have gone much further south."

A new high-resolution global ocean circulation model designed by Condron and Winsor and developed with colleagues at MIT, shows that the Lake Agassiz flood actually traveled 3,000 miles further south than scientists had previously thought. And instead of getting caught up in a subpolar gyre, the flood covered a subtropical one.

Condron said the flood's direction was not previously realized because the models scientists were using to track ocean currents were too low-resolution to detect the freshwater flood.

The results, said Condron, are relevant for how scientists model and examine the Greenland and Antarctic ice sheets, which are now melting.

There are currently no freshwater lakes as large as glacial Lake Agassiz that could suddenly drain into the ocean. But we're not in the clear. The ice sheets over Greenland and Antarctica are essentially frozen reservoirs of freshwater. If these melt fast enough they have the potential to disrupt ocean circulation, Condron explained. Although scientists believe the entire melting of the two ice sheets will take several thousand years, the freshwater released from the melting ice has the potential to disrupt the present stable climate, he said.

It is unclear what this 3,000-mile change in trajectory of the mega-flood means for how scientists interpret the planet's most recent glacial period, Condron said. That's where his research is heading next.

This "will influence how scientists understand what causes sudden changes in climate," Condron said.❑

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Courtesy of Alan Condron

This map shows how ocean currents are believed to have existed 8,200 year ago: cold currents in blue and warm ones in red. Also shown are glacial Lake Agassiz and the Laurentide ice sheet in the Hudson Bay area of Canada. A new ocean current model is changing scientists' views on the impact of a giant, ancient freshwater Agassiz flood.