

POLLUTION CONTROL

MICROBES TO CLEAN UP MARBLE?

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A marble figure outside the Field Museum of Natural History in Chicago shows the damage that black gypsum crust can wreak.

LOUISVILLE, KY—A researcher here thinks he may have a way to save face—save the faces of weathered marble statues, that is. K. Lal Gauri, chairman of the geology department at the University of Louisville, hopes microbes can be used to chemically convert the black gypsum crust that forms on marble monuments back into the original calcite.

Gypsum, which builds up when sulfur dioxide in the air reacts with marble, has become a significant problem in developed countries. The damage to monuments and architecture—both in terms of dollars and heritage lost—is serious and increasing as more countries industrialize. The sulfate crusts can be cleaned off with chemicals or by sand-blasting, but this wears away the surface of the marble. Gauri, however, hopes bacteria of the genus *Desulphovibrio*, will represent a solution.

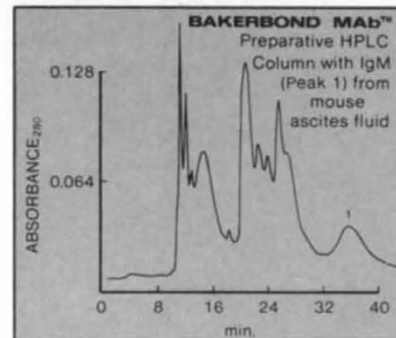
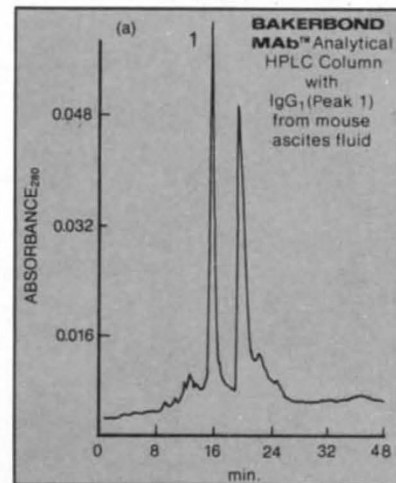
In nature, these bacteria use sulfate ions to oxidize carbon compounds for energy. By providing enzyme cata-

lysts, they may be able to speed up drastically the conversion of gypsum back into calcite. Gauri says the activity of these bacteria could explain why so much calcite has formed in the salt domes of Louisiana and Texas. He hopes that under anaerobic conditions and with petroleum as feedstock, *D. desulphuricans* may be able to do the trick for marble statues as well. So far, however, he has no experimental evidence to back up his theory, so Research Corp. (New York, NY) refused to help him try to get a patent on his work.

Recently, Gauri began doing laboratory tests on small pieces of gypsum-encrusted marble. By applying air-tight wetpacks of bacteria and petroleum, the researcher will be searching for the right set of conditions for the chemical reconversion to occur. Then he intends to do tests on marble objects with gypsum crusts in a Louisville cemetery. And after that, it may be on to restoring marred marble statues. —Arthur Klausner



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