

Under martian ice

Cold ... and never more alone.

Stephen Baxter

I suppose it was the Fermi paradox that drew me into science in the first place. I never expected to find a resolution to the paradox — not here! But that, it seems, is what lies beneath the ancient ice of Mars.

It's a shame that this discovery is hogging all the headlines back home, for our assault on the martian South Pole is an epic in its own right. The ice here is old and dirty, polluted with traces that might let us reconstruct Mars's climatic history, just as on Earth. And the morphology is extraordinary, with vast canyons spiralling out from a central dome, a self-organizing system 1,000 kilometres across.

But the adventure here is very human. We're deep into our first Earth-year-long polar winter. We're occupying ourselves with sample analysis, mailing home, teaching one another languages — would you believe a dozen spoken fluently by our polyglot six-strong crew? In other words we're over-wintering, just like Shackleton.

And, along with the rest of humanity, we're mulling over the implications of our discovery under the ice.

The bedrock under the ice is among the oldest on Mars. One of our key objectives here was to assemble detailed maps of the hidden landscape with sounding radar and active seismology. What we found was something utterly unexpected.

It's a quite inhuman layout, of low walls outlining pentagonal and hexagonal areas, within which boxy structures huddle. We don't know its purpose, but the 'city' under the ice is unmistakable as a sign of intelligence. Somebody has been here before us.

Of course these structures are not native. Eighty years after the first successful robot landers, we were sure that life here never advanced beyond stromatolites. I have a sneaking feeling that whoever built the city wasn't so terribly unlike us. They were drawn by the adventure of reaching the pole, just as we were.

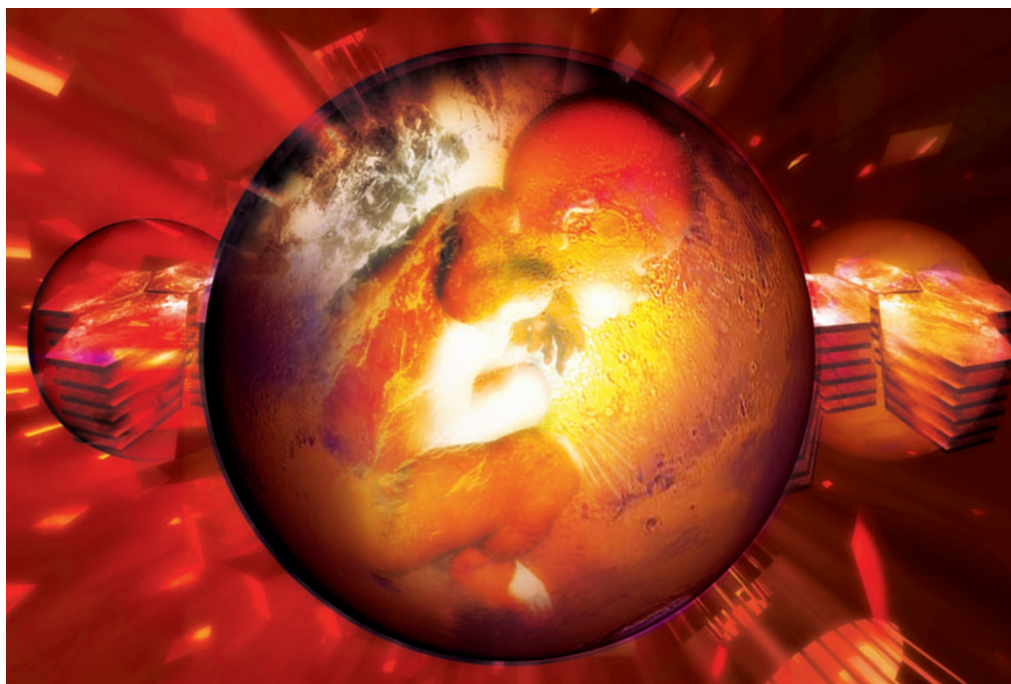
But it drives me crazy that we'll probably never know. It's already clear that their visit must have been long ago — long even for a geologist like me, billions of years back. Which is where Fermi comes in.

I'm sure you're familiar with the question Enrico Fermi asked in 1950: "Where is everybody?" If extraterrestrial aliens exist, they should have spread everywhere by now. So how come we don't see them? Our vision of the Universe has expanded greatly since 1950, but we've still turned up no incontrovertible evidence of intelligence away from Earth. Until now.

In retrospect, we should have expected to find traces of long-gone travellers. Interstellar visits were actually more likely in ancient times than now. The Galaxy's peak star-formation rate seems to have been some

did come long ago, they didn't visit a roiling young Earth, but the relatively advanced biosphere of Mars.

We talk of nothing else. Our key activity next summer was to have been our ice core, kilometres long, all the way down to the basement rock. Now we don't care about Mars; we're diverting the core to try to get a sample of the 'city'. The biologists are excitedly debating how to distinguish any traces of life. But if the alien visitors practised Planetary Protection Protocols as scrupulously as we do, they may have left no trace of themselves at all.



five billion years ago — just before the birth of the Sun — so most stars and planetary systems must be older than our own. The Galaxy's climax as an arena for nurturing civilization was deep in the past.

And if they did come to the Solar System so long ago, where would they have visited?

Early Mars was more hospitable to life than Earth. Being smaller, Mars cooled quicker, and life made an earlier start. Mars was less of a target for the planet-sterilizing impactors that roamed the young Solar System. Young Mars even enjoyed an atmosphere rich in oxygen. Indeed, as everybody knows by now, we've confirmed that the original source of life on Earth was in fact Mars, transmitted by impact-detached meteorites.

There's the resolution to Fermi, at last. We don't see anybody because they have long gone, their worlds exhausted. And when they

It's driving me crazy. I'm bending mission rules to do it, but I go out in sleep periods, and walk away from the base, and think.

We humans are just not used to being alone. We evolved in a world full of non-human hominids, other kinds of mind. That's why we fill the sky with demons and aliens; we can't stand the echoing silence we have created. And now we know that we will find nothing out there among the stars but exhausted worlds, and museums, and ruins.

I keep these thoughts to myself. The martian winter is long, and morale is everything. I let it all out on the frozen air, under Jupiter's wheeling moons, a 50-year-old geologist as mixed up as a 10-year-old. Then I walk back to the human warmth of our base.

Stephen Baxter's most recent novel is *Exultant* (Gollancz, 2004). He lives in Northumberland, UK.