EXO-GARBOLOGY

A couple of recent entries have been on the connections that run through garbage, science fiction, space exploration and archaeology. [Link] [Link]

Here is more from

Bill (Rathje) on exo-garbology

– connections with the pioneering spirit of exploration, and memorabilia. A piece of his from 1999.

On June 17 this year (1999), Air Force trackers of "space junk" alerted NASA that a spent Russian booster rocket was headed straight for the International Space Station. By sheer luck alone, the huge relic missed blowing the ISS to smithereens by only five miles.

My first thoughts were, "how in tune with recent human history it is that our garbage should come back to haunt us". Then, I couldn't help but dream of an exo-garbology – meaning the study of space junk created by "intelligent life" [and I use "intelligent" with some misgivings] – to help humans learn from past garbage mistakes.

But are earthlings conducting the first "exo-garbology"? Perhaps not. As recently as August 1996, a

NASA team examined a potato-sized chunk of Mars. They tentatively concluded that it might contain signs of life. While the evidence was only a few specks that resembled fossilized microbes, the announcement led bookmakers in London to raise the odds of “intelligent life” somewhere in our universe.

If there are currently exo-garbologists on other planets, I wonder what they make of our first venturings into their realm. As any earthling knows, what most defines our humanness is our indefatigable urge to create garbage — the bounty from which archaeologists learn about human lifeways. Consider what an Indiana Jones from another planet would know about us.

Appropriately, the Earth is surrounded by orbital flotsam. But unlike the hordes of miniature moons neatly aligned into rings around Jupiter and Saturn, according to Nicholas Johnson (Scientific American, 1998), Earth’s hanger’s-on “resemble angry bees around a beehive, seeming to move randomly in all directions.” When you look at their numbers, you can almost hear them buzz.

First, there are about 10,000 “resident space objects” – only five percent of which were functioning spacecraft in 1997. Spent artifacts include some 1,500 empty upper-stage rockets, a myriad explosive bolts, leftover after separation from their payload, lens caps jettisoned from sensitive instruments, and a glove lost by US astronaut Edward White during a 1965 spacewalk.

Of course, although it is not often mentioned, there is real ?garbage?. During its first decade in orbit, for example, more than 200 objects drifted away from the Mir Space Station, most appropriately hooded in garbage bags.

But the greatest source of significant-sized space litter is approximately 150 satellites that have blown up or fallen apart, leaving a trail of 7,000 fragments large enough (more than 10 centimeters in any one dimension) to be tracked from Earth. To make matters even messier, NASA estimates that there are another 400,000 space artifacts too small for us to detect, as well as one million small flakes of paint and other tiny specks of fast-flying debris. No wonder that space shuttle windows have been replaced with growing frequency during the past decade.

But perhaps most surprising, in 1990, the surface of a recovered satellite that had been in orbit for six years was found to be speckled with urine and fecal material – another discard from Russian and American space missions.

To some of us on Earth, this gaggle of space junk may sound like a laughing matter – that is, unless you were in the outback of Australia when the remains of the 100 ton Skylab, our first space station, survived re-entry into the atmosphere and crashed there in 1979. Or unless you'd imagine what would have happened if the rocket shell had hit or even just grazed the Space Station! Then you'd know why understanding the causes and trajectories of space junk is important to humanity's future in space. That is the reason the Air Force and NASA have their own brand of exo-garbologists tracking and modeling the future of our space orphans.

By now, extraterrestrial exo-garbologists must have some theories about why we continually shoot ourselves in the foot with our castoffs. Perhaps they have reasoned that this kind of faux pas occurs because of one of the most consistent human-artifact relationships: whenever we humans try something new, we

throw everything material we can at it to make our attempt successful. The result is a tremendous accumulation of leftover junk.

In fact, frontiers – whether physical or theoretical – are junk magnets of immense proportions. That's because we tend only to worry about the success of our immediate goal – settling an "untamed" land, "conquering" Mt. Everest or Mt. McKinley, "harnessing" nuclear power as an energy source – and not about cleaning up the mess we leave behind.

American pioneers abandoned so much of what they originally loaded onto their wagons that professional scavengers regularly followed the Trails West to glean the leavings. Organizations friendly to the environments of both Mt. Everest and Mt. McKinley have recently become concerned about oxygen bottles, climbing equipment, camping gear – left behind in massive fields of eyesores. And who can forget our nuclear waste dilemma – tons of radioactive material without any disposal plan in place. As a result, today, many of the storage containers of older wastes are too degraded to move safely even if there were a place to put them.

Space exploration has obviously been no different.

So now earthlings are stuck with two kinds of non-functioning space artifacts – those in the heavens and those used on or brought back to earth.

Those on the earth are not such a problem. The main reason is that most, if not all, humans seem to have an uncontrollable desire to collect, and for decades people have been acquiring space memorabilia. The intensity of private collectors is documented by two massive Sotheby's auctions, held in 1993 and 1996, of Russian space artifacts, much of it "looted" from the old Soviet Union. But even the monetary value of space artifacts pales beside the educational and emotional potential of items that have been out in space and come back.

In the US, besides the government's Smithsonian and various NASA museums, there other public contenders for these treasures, such as the Cosmosphere in the city of Hutchinson, Kansas. Such organizations save never-used, but deteriorating, backup spacecraft from neglect and landfills.

Most distressing about the junk still in space is how it affects our space future. Sadly, because of orbit speeds of 20,000 feet per second, both mammoth and miniscule space junk are currently the most serious threat to the safety of the International Space Station and its future occupants, even with the potential of new “bumpers” which use several layers to shatter and slow any projectile.

If we look at all the Earth-generated debris in space as a great metaphor for the profligate discard practices of humanity, there seem to be a few lessons:

We – Americans, Russians, and all other space entrepreneurs – created all our gizmos with little thought about disposal. What else is new? Lesson 1: Whether designing a new clamshell for burgers or the next flight to Mars, it is only responsible to plan for disposal during invention.

Our collection-mania for space objects is still far from satiated. Lesson 2: There will be gold out there for whoever figures out how to recapture, renovate, reuse and recycle the garbage we have already wrought.

The first and so far only man-made object to leave our solar system to sail among the stars is a little Pioneer 11 robot-spacecraft that was launched in December 1974 and spectacularly fulfilled its task of exploring Jupiter and Saturn. On its side is a plaque designed by the late Carl Sagan that shows a woman and a man, plus the location of the sun in relation to several prominent stars, and Earth?s status as the third planet out. In the vacuum of space, the little messenger will last essentially forever, though its electronics have long since died. The idea is that someday some space-faring civilization might stumble across Pioneer 11 and know that life exists on this small, blue planet.

How fitting that our first emissary to the stars is our trash.

Postscript: And the reason to clean up our space may be more than astronaut safety and money. One vision of the form that intelligent life on other planets might take was the summer 1997 movie Independence Day. Light-years from the cute and lovable E.T., Independence Day aliens were mad as hell at the human race. The question the movie really didn’t explain was the source of the

grudge against Earthlings. After reviewing how much garbage we've left in space, I think I know the answer.