DEALING WITH LEAD ROT

The first and best source for Star Frontier miniatures is the out of production TSR miniatures especially if you want miniatures of the Frontier's unique alien inhabitants. However, TSR produced these in lead during the early '80s at the time when manufacturers were beginning move away from lead toward pewter. Lead has two inherent problems; it's toxic and it's prone to lead rot.

A fellow war gamer at my club is fond of referring to these as bite size pieces of toxic waste. I'm not sure I'd use the word waste to describe them but there is no disputing their toxicity. Because of this inherent danger it's often necessary to work with them in controlled locations and use "clean procedures," washing hands and face after exposure to lead dust and using a work apron or changing clothes.

Lead rot is a corrosion of lead also known as lead disease, lead cancer or lead bloom. A great source of information on lead rot is the Carderock Division of the US Navy that curates the Navy's collection of 1900 ship models that have been built between 1813 and today. They have a published paper on the web at: http://www.dt.navy.mil/cnsm/lead_01.html and it's more than you ever needed to know about lead rot. Basically lead rot happens when ascetic acid and carbon dioxide catalyze with lead to produce lead acetate and lead hydroxide. Lead acetate and lead hydroxide react together with carbon dioxide to form lead carbonate which will in turn release ascetic acid and the process repeats till the entire piece is consumed and only a gray powder of lead carbonate is left.

Solutions for lead rot range from electro plating to hermetically sealed cases devoid of CO2. Electro plating might be acceptable for space ship models but the loss of fine detail on other miniatures make this a generally unsuitable solution. Limiting exposure to sunlight and ascetic and formic acid and maintaining a good exchange of air is the current best strategy being used to preserve the Navy's models.

My current strategy and only time will tell if I'm successful is to prime all TSR miniatures in my collection that currently have no signs of lead rot in an attempt to exclude CO2. About 40% of all miniatures that I've bought through EBay have been free of lead carbonate. One EBay seller responded to my inquiry about his factory seal box sets that the TSR product sold through Sears & Roebuck had been of a better quality of metal and seemed to be immune to the affliction. I did buy his two sets which did have a sticker on the shrink wrap with Sears' name and they were indeed free of lead carbonate. I'm guessing that Sears required higher quantities of impurities like tin or antimony in the product sold through them as the scientist at Carderock discovered that the purer the lead the greater the likelihood of lead rot. So I prime and paint any TSR figure that is free of lead rot usually after a baking soda bath to neutralize any ascetic acid present and remove them from the card board box they came in.

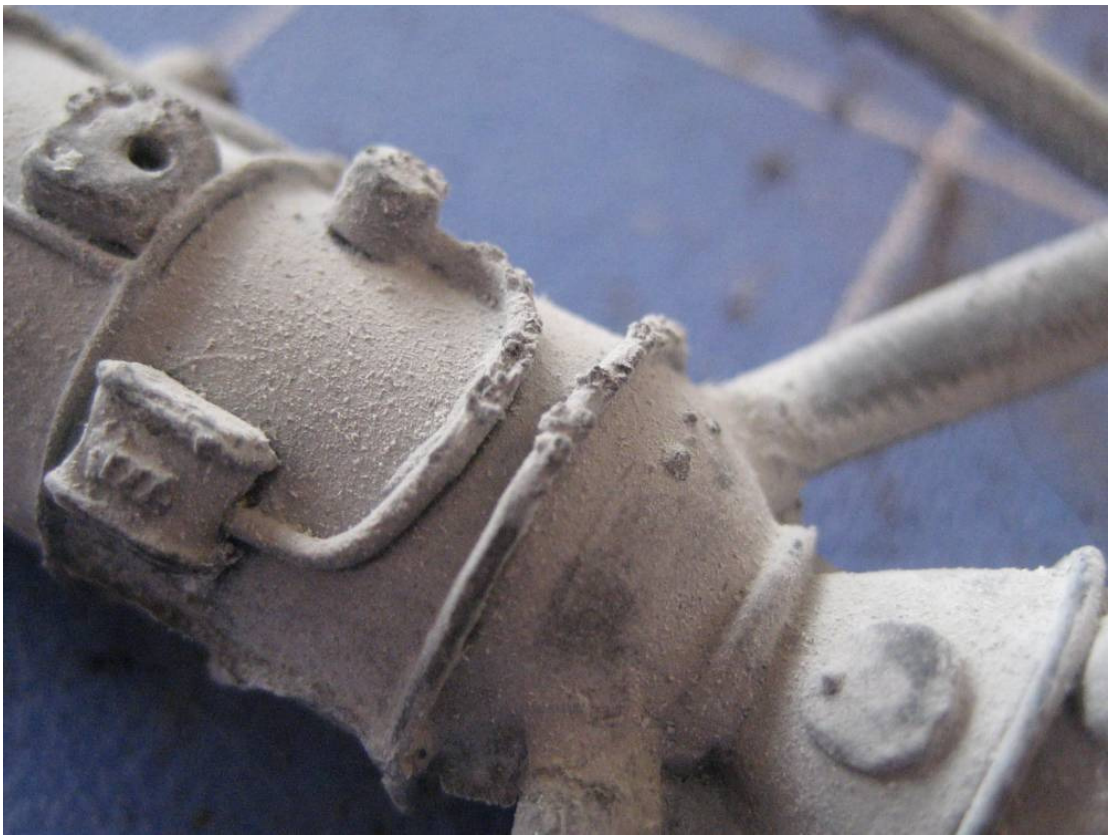
With miniatures that have light blooming I soak them for one to three days with baking soda and water. The miniatures will require a scrubbing with an old toothbrush under running water to help remove both the lead carbonate and residual baking soda. Having steel wool handy during this step will help with burnishing the miniature down to the shiny metal without damaging it and it aids in scrubbing away lead carbonate. The next step involves using a craft knife and files to remove any remaining lead rot. It is

surprising how deep the pitting can go and the process of excising the cancer can mar the figure beyond usability. I find that the ship miniatures can take the “marring” better as it can be passed off as battle damage or just represent one of the myriad of differences that often exist between ships of the same class. Once the mini is cleaned of any traces of lead carbonate it should be primed immediately and in the case of the multi part models all sides of all parts should be primed. Enamel paints are not a guarantee against ascetic but the hope is that a good sealing can prevent CO2 exposure. All of this conservation can be labor intensive and one reason I sometimes leave minis soaking for days in the baking soda wash and clean a few at a time. I’ve now have had some conserved lead miniatures for a year and they as yet haven’t shown any blooming of lead carbonate from under the paint.

Some miniatures are just too far gone to save. It’s a judgment call that can be painful if you love this hobby but once I’ve made it I dispose of them. There is no value to saving a toxic substance with such an affliction of as lead rot. It is only a mater of time till it turns entirely to lead carbonate.

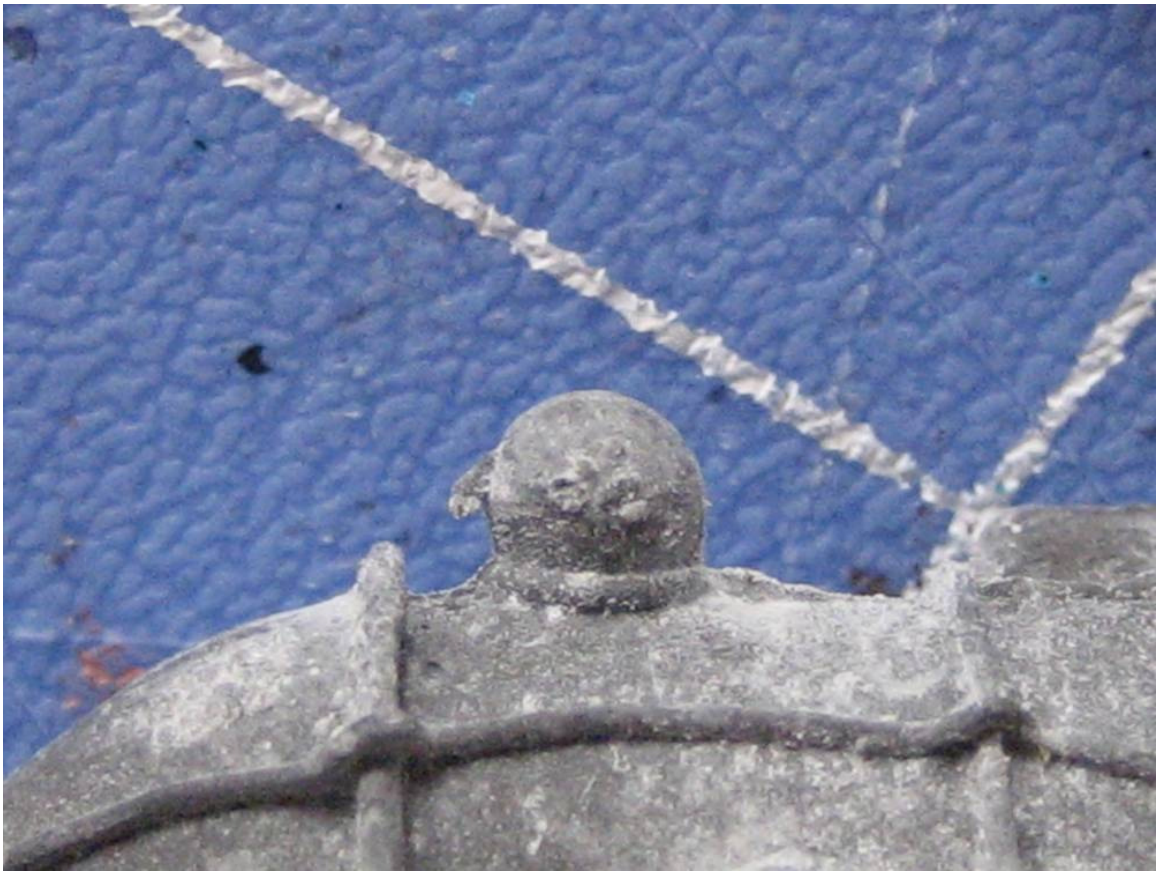
The milky white miniatures above are from using too much baking soda in the bath.

Old toothbrushes and steel wool are crucial to cleaning lead miniatures.



This is an example of light blooming that could be ground away but will obliterate a lot of detail. I keep leaving this one for a more ambitious day.

Until you actually start filing away the corrosion it hard to tell if it would be better to cut off the part and replace it. This doesn't look like much but it could represent a lot of time working with files.



This is a very light bloom that could be filed away.

Here you can see a part that has been burnished with steel wool. When blooms appear in open areas instead of on top of detail they're significantly easier to file down. There is other pitting seen here that was not associated with lead rot.