
Dry-Cleaning on Pern? Of Course!

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You're walking the gather and a dancer bumbles into you, knocking your glass of Benden white all down the front of your new gown.

A child racing by with a bubbly pie in his hand trips and falls; the pie flies through the air and lands at your feet, bubbly pie juice arcing across your skirt.

Your father bequeaths you his clothes; soon thereafter he dies. Inside his press you find several exquisitely worked tunics that must be decades old. There is no apparent clothfly damage. You wonder if you could clean them up and wear them.

Any of the above scenarios might form a small part of anyone's Pern story. Or they might form a very big part of a character's life, particularly if that character is, as one of mine is, trained as a fabric cleaner in the Weavercraft at Telgar.

Fabric is a big part of the way we picture Pern. We're all interested in our persona's clothes, in the everyday items like beds and firestone sacks, in the decorations that make the main halls of every Hold less cold and forbidding (at least everyone knows about the tapestry Lessa used to guide her 400 Turns backwards in time!). But the hard fact of everyday life is that those fabrics are a degradable resource: they get dirty, they get torn, they get wet, they age. A large part of the Weavercraft's daily business must lie in dealing with all of that wear and tear on their fabrics; and I doubt that any decent sized Hold would be without an apprentice clothcleaner, trained at Telgar or one of the very large Holds where sheer population would ensure that there would need to be an advanced clothcleaner on hand.

The modern answer to cloth stains of any kind seems to be "put a little soda water on it!" This is partly a result of living in a society where fabric is cheaply and quickly mass-produced, and partly because of synthetic fibers, most of which are very hard to stain or break. Anyone on Pern would be aware that every scrap of fabric represents an enormous number of worker-hours and a lot of scarce resources. You don't just buy the fabric for your dress and forget about it. You're probably aware, on Pern, of how much time it takes to raise the plant or animal, harvest the fibers, spin thread, weave fabric or tan hides, dye the material, etc.

You'd have to be very young or very stupid not to be aware of the value of fabric and therefore not to have some idea how to best deal with stains and such things. Unless you were particularly unthinking (or maybe a bronzerider), you would not even attempt to put water or anything like it

on a stain. Not only is this the absolutely worst thing you can do, it's unlikely that Pern has a lot of soda water. So let's look at what Elida, my clothcleaner character, might do or say when-faced with any of the above scenarios.

The woman with Benden white down her dress will, if she's smart, take it to the clothcleaner as soon as she can even if, as is likely, the wine dries to invisibility. This is because sooner or later the sugars in the wine will caramelize in heat or sunlight or just through the passing of time. Caramelization is just that -- the sugars turn to caramel which you undoubtedly know is brown. The supposedly clear stain will undoubtedly reappear as a brown stain that is absolutely not removable somewhere down the line. I imagine if the woman is important enough, she will simply leave the care of her clothes to a servant; I hope she knows enough to tell her about the wine, otherwise that poor servant will be blamed when the brown stain appears in a year or so, and it won't be her fault.

If the dress is brought to Elida, she has to find a way to dissolve the sugars without ruining either the color or the texture (the stiffness or "sizing") of the fabric. Sugars dissolve most readily in water. Unfortunately, most vegetable dyes, the sort probably most often used on Pern, are water soluble. The Smithcraft hall would have no trouble in building a foot- or hand-pressurized water tank with a nozzle that would deliver a high-pressure, fine mist of water; this is what modern dry-cleaners use to spot-clean water-soluble stains.

If the fabric was a print or something like that, Elida would spot-clean the wine out with water. The fine mist would not be a lot of water, would not soak the fabric down, so it's unlikely that the dyes would fade very much. What fading there was would probably be unnoticeable in a pattern. If the gown is a solid color, there would be a slightly faded patch where the water had dissolved some of the dye. If the owner was adamant that the gown should be returned to her perfect (it was expensive, it was new, etc.) and the dye was not too rare and Elida had the materials to match it, she might re-dye the fabric. Since so many cleaning procedures result in a fading of dyes, re-dyeing is a big part of any fabric-cleaners' repertoire of tricks.

How about that skirt with the bubbly-pie juice on it? Here there are two problems: the sugar, and the (practically permanent under some circumstances) color of the berries. Let's add another variable: the skirt is made of wool. Woolybeasts (sheep) are part of the ovine family, and according to the Dragonlover's Guide to Pern, both long and short haired varieties survived, along with llamas and goats who produced hair suitable for spinning (though not, alas, the Kashmir goat.) Different plant fibers (flax -used in making linen, cotton, and sisal, a very rough fiber related to hemp, are all available on Pern) react differently to dyeing and cleaning, and the whole class of them in turn reacts differently from the class of animal fibers, which also have variations among themselves. What this boils down to is that what the fabric's made of makes an enormous difference in the way one cleans it. Plant fibers are on the whole easier to

clean, since you can use water on them, even if in sparing amounts (though water will take the "sizing" out of linen, making it limp -- linen must be "resized.") Wool -- and goat hair, horsehair, and bovine hair -- is a whole different ball of wax.

Wool and similar animal fibers (as opposed, say, to angora or cashmere, neither of which is apparently available on Pern) has a tendency to felt when wet. This is "felt" as a verb, though the resulting fabric when wool has felted is -- you guessed it -- felt. When wool is wetted and agitated (pounded, stretched, pressed), the scales of the hair lift up off the hair shaft against which they normally lie flat and interlock with each other. This is why felt is very strong and very thick. This is also what happens when you wash a wool garment in a washing machine with hot water and get back a garment much smaller and thicker than the one you put in. So special care has to be used in cleaning wool or animal fiber garments.

You can use minute amounts of water if it is not hot and if you do not agitate the fabric when it is wet. So Elida could spray out the sugar of the bubbly-pies with her water-spray. (NOT steam, as it is hot and would cause the fibers to felt almost immediately.) But what about the color? Most likely when she received it {unless the owner was stupid enough to put water on it} the color was coating, but not actually inside, the fibers that make up the fabric of the skirt. Her water-spray would break up the color from the berries and soak it into the fibers themselves before it would remove the color. So the sugar would be gone but the berry-color would now be a permanent stain.

So what can she use besides water to clean that skirt? She has two options: a petroleum based solvent, or fuller's earth.

Fuller's earth is a very dry, absorbent clay used by the Romans to clean their togas and used up through medieval times as well. I'm sure that there is some sort of equivalent clay mined somewhere on Pern and sold in vast quantities to the Weavercraft. It is pounded into the fabric (naturally, if it were a delicate wool it couldn't be pounded very hard or it would felt,) and the clay absorbs a good deal of grease and bonds to dirt. When it is pounded back out of the garment, or blown out (if you have pressurized water, why not pressurized air?) it takes grease and dirt with it. It is especially effective on greasy dirt, and good for outer, thicker wool garments, but wouldn't be much use here.

So that leaves us with petroleum products. Modern dry cleaning is done with a petroleum derivative (carbon tetrachloride) much safer than petroleum products used before World War 11, which were similar to kerosene and VERY flammable. Petroleum products tend to be good solvents but do not penetrate the fibers of fabric the way water does. So a petroleum product would dissolve most or all of the stain color without harming the fabric. Since dyes are set by various chemical processes into the fibers of the fabric, petroleum products do not significantly affect most dyes either. Of course, some dyes, like very deep, brilliant reds, are very "fugitive" (they like to leave the fabric as

much as possible, whenever possible) and would probably fade a little even with a petroleum product. So it is better, if you're going to use a petroleum product -- or even if you're using water -- to wash the whole garment rather than spot-cleaning it if you can, so that whatever fading does occur will occur over the whole garment and you will not just have a faded spot that may be as annoying to the owner as the original stain.

We know Pern has petroleum, "blackrock water,". It is used to fill the firepits, since it burns hot and long. It is probably not burned in its crude state, but is at least slightly refined. Refining oil into its byproducts, tar and gasoline or kerosene, was known to the Romans and early medieval Arabs, so there is good reason to assume that the Pernese probably figured it out as well and could construct the equipment to do it. Whatever they called the highly solvent fluid they got from the refinement -- "thin oil"? "cleaner-oil"? or just "solvent"? -- it would be expensive, dangerous to work with, and probably leave a distinct odor on the fabric. It would not be as free from smelly extras as today's super-refined cleaning solvents, and even now people complain about the "smell" of their dry-cleaned clothes. I would expect that thin oil would be reserved for cleaning very complex pieces involving many fugitive dyes, like for instance Lessa's brilliant and complex tapestry, since one would not want to take the chance of even a little fading there, but it would have plenty of time, hanging on the side of the hall, to air out.

So what is Elida going to do with that skirt? Let's assume it's a simple, common color of yellow. She'll probably carefully pound in some cleaner's dirt (fuller's earth) to take out the oil and some of the color and sugar from the pie, and blow it out with pressurized air; then wash out the sugar and as much color as possible with pressurized water. The stain would be very faint but what was left of it would be irretrievably set. If the owner wasn't happy enough with that, she'd probably dye the entire garment a darker color, which would mean all but the faintest traces of the stain would be invisible. If it were a very good, fancy skirt, she might take a chance on spot-cleaning with thin oil, or even washing the whole garment in it -- but that would be expensive, smelly and dangerous for her, so it would be a last resort. There are any number of combinations of steps she could take, depending on the value, color, pattern, decoration, fabric fiber, and pickiness of the owner, of the skirt.

I should mention here that petroleum based products are the only way to clean leather, and that they invariably 1) dry out the leather, making it more brittle than it was, and 2) remove all the dye. Anytime a leather garment is cleaned it has to be redyed, and if the color doesn't exactly match, well, that's just too bad. Leather cleaning is probably a specialty in the Tannercraft hall, and if someone really important wanted something leather cleaned very badly, his local clothcleaner might ship it to the nearest leather specialist. But on the whole, leather is difficult to clean and the results are not worth the effort, so it's likely that if klah is

spilled on a rider's wherhide jacket, then he's got that stain as long as he's got that jacket. Considering how many more garments are made of leather on Pern than on Earth (if we follow the Dragonlover's Guide to Pern) we can assume that there are a lot more stained clothes being regularly worn on Pern than we see here.

But then this is probably true of fiber clothes as well. Consider that, unless you're an important dragonrider, a holder, or something better than a lowly journeyman, you probably have only two or three suits of day to day clothes and one good Gather outfit. Your day to day stuff probably has a lot of stains on it, if you're clumsy or in a stain-producing profession like cooking, because you just throw them into the washing pits and wash them in water every once in a while and the stains you have are the stains you have. But if something gets on your Gather outfit, you're going to be mighty annoyed, aren't you? After all, you don't get to buy new Gather clothes all that often. So you're going to want the clothcleaner to work hard on it, and get it looking as close to new as possible.

One last short problem. What about those old tunics? Well, if the owner were smart, he'd bring them to the clothcleaner and have them cleaned. How well they turned out would depend on all the factors mentioned above, and whether they were cleaned before they were stored in that press. Maybe some clear stains have caramelized in the time they've been in there, or maybe just sheer dirt has worn through some of the fibers and made holes. Dirt, even invisible dirt, acts like sandpaper on cloth fibers and eventually will break them down. If Elida took a long time on them and gave them a good deal of attention, they would probably come out looking close to good as new. But there's also every chance that, even if you don't see any evidence of them, clothflys (moths -- I'm sure Pern has them or their equivalent, given that many of the imported insects survived) have been nibbling on them, weakening the fibers already made brittle by age so that, even as Elida most carefully and gently cleans them, holes appear as if by magic! The owner would probably blame Elida, but if he asked a Weaver journeyman or master, he'd find out that it wasn't really her fault.

There is a way to fix holes caused by clothfly damage; the fabric could be rewoven in those spots. If the damage was extensive there would not be much point in attempting this. Reweaving is done with very fine needles, and the thread would have to match very closely with the original color. Maybe this man could have one of the garments restored like this, to wear in memory of his father.

Those are just some of the problems Elida might face as a clothcleaner in Telgar Hold or newly arrived at Logres Weyr. Each garment she was asked to clean would need a different solution. It really would be a challenging and creative job, being a clothcleaner on Pern!