Health and Safety

Up In Flames?

Chris Stavroudis, column editor

About the only magazine I read religiously is *Scientific American* (other than, of course, our professional journals, newsletters, and this publication which, like you, I devour the moment it arrives). The column "50, 100 & 150 Years Ago" is a one page précis of what appeared in *Scientific American* 50, 100 & 150 years ago.

The September 2007 issue contained the following item from 1857, which I quote in full:

> "Many ladies have been burnt to death by their light gauze and cambric dresses taking fire and blazing up before there was time to extinguish the flame. Actresses and danseuses are most liable to this, and the talented Clara Webster and others lost their lives this way. It ought, therefore, to be generally known that by steeping the dress, or material composing it, in a diluted solution of chloride of zinc, it will be rendered fire-proof."

[Cambric, for those of you, like me, who don't know, means "a thin white linen or cotton fabric."]

150 years later, we are rightly concerned about the fire retardant chemicals to which we, and the environment, are exposed. (See this column last year, 29/1, for a discussion of the ubiquity of modern pollutants including the flame retardant PBDEs, polybrominated diphenyl ethers.)

The alternative to having these chemicals around us, danseuses bursting into flame, is we hope worse than the possible health hazards of exposure to these chemicals. If you don't give a whit about danseuses, and shame on you if you don't, how do you feel about infants immolated in their cribs due to flammable sleepwear?

This dichotomy between acute and chronic consequences of our existence is something that society and individuals must ponder. Conservators must also make these types of decisions. We balance long term preservation with questions of aesthetic enjoyment, historicity, and use. The recent controversy about flame proofing of theater curtains treated by conservators resonated with my mental images of smartly dressed ladies in their cambric finery bursting into flame.

The theater curtain controversy was fortunately mostly about miscommunication and not violation of any fire codes. But hypothetically, what if a conservator were to treat a painted theater curtain by lining onto new fabric with a wax resin adhesive? (Let me emphasize that this was not a treatment used in the Vermont theater curtain project.) But what would this giant candle do in a fire?

To be honest, I've never thought about the flammability of treatments I've used. And I've certainly never weighed the potential flammability of one treatment verses another in the process of determining the best treatment for a particular work of art.

In some circumstances might using flame-proofing chemicals on historic materials be the better choice, even if these chemicals negatively impacted the ageing properties of the artwork? [I would be interested in hearing from conservators who have dealt with these issues.]

And speaking of bursting into flames, this being universally agreed a bad thing, whether a danseuse or traveler, there is a new safety rule for airline travel. Batteries containing lithium are now considered a potential hazard and as of January 1, 2008, must be carried on flights according to new rules. (Remember those recalled batteries in a number of computers which had a propensity to burst into flames? Not something one would want occurring while traveling on an airplane.) Another problem with lithium batteries is that the fire suppression systems on airplanes will not extinguish a lithium fed fire.

There are two types of lithium-based battery, and each can be restricted in some cases. Lithium ion batteries are the rechargeable types used in computers, cell phones, and newer technology rechargeable power tools. Lithium metal batteries are the "longer lasting" more expensive batteries often used in cameras and now sold as long life replacements for conventional batteries (e.g., Energizer e^2 lithium batteries).

Most common lithium metal and lithium ion batteries may be carried installed in their devices in checked baggage. However the devices must be secured or locked in an off position. Spare lithium batteries (those not installed in their intended device) may no longer be carried in checked baggage. Spare batteries may be carried in carry-on baggage but they must be insulated against accidental shorting. They can be carried in their original packing, with protective covers, in plastic bags or with insulating tape over the terminals.

There is no limit to the number of small batteries that may be transported in your carry-on luggage. This appears to include the batteries used in most laptops and cell phones. Travelers are restricted to two spare larger rechargeable lithium ion batteries. The larger devices are things like external battery packs for laptops that offer a much longer running time than internal batteries. Very large lithium metal and lithium ion batteries are banned from flights, but these are not common commercially.

The specific rules are confusing and are based on whether the battery is lithium ion or lithium metal and the equivalent lithium content of the battery expressed in grams. With time, manufacturers will undoubtedly disclose this equivalent lithium content of their batteries which will make the rules much easier to interpret. For more information see dot.gov/affairs/phmsa1107.html, and safetravel.dot.gov/whats_new_batteries.html.

Conservators traveling to work onsite should pack accordingly. The bottom line, don't pack your spare lithium batteries with your cambric dresses.

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