

CLOSE ENCOUNTERS OF THE LAB KIND

THE SANTAYANA REPORT

George Santayana was a Spanish-American philosopher, essayist, poet, and novelist. In 1905, he penned the famous aphorism “those who cannot remember the past are condemned to repeat it.” More than a century later, the saying reverberates with professionals the world over. The following is a summary of a recent incident at Columbia University. The information presented is intended to provide awareness and help readers plan against the occurrence of a similar situation in their laboratory or work area.

How to Avoid a (Procedural) Creep

While working in a chemical fume hood, a graduate student began heating a flammable solvent to its boiling point as part of a routine procedure for purifying the solvent and stepped away for a few minutes to continue their other work. Five minutes later there was a loud sound as the apparatus burst and the fume hood was engulfed in flames. The occupants called Public Safety and evacuated the laboratory. No one was injured, however there was significant damage to the laboratory as the fire consumed the fume hood and destroyed a full rack of glassware.

Post-fire, the graduate student noted the solvent flask was overfull for the apparatus. There was an understood volume limit in the laboratory’s procedure for operating this apparatus, to leave enough headspace for boiling and prevent the buildup of excess pressure. A few days before the incident the apparatus operated successfully while overfull by another laboratory member. This may have contributed to the graduate student’s decision to continue despite knowing the solvent flask was overfull. In habituating to a seemingly minor adjustment in protocol, the graduate student encountered what has been coined, “procedural creep,” when an established protocol gradually slides off course until it is no longer being followed.

Lessons Learned

- The laboratory did many things right:
 - The researchers called Public Safety, which enhanced FDNY response time. They made a smart decision not to attempt extinguishing a larger fire and quickly evacuated the lab. This helped minimize the extent of the fire and ensure no one was hurt.
- Actions that may help prevent this type of incident in the future:
 - Experiments are constantly being adjusted to support emerging research. Think about what is the most hazardous procedure in your lab. What elements of it can change? What must remain the same? The ACS has a comprehensive how-to guide, linked here: [*Identifying and Evaluating Hazards in Research Laboratories*](#).
 - Consider establishing checks and balances, such as a quantity limit for working with a particularly hazardous reagent, which will trigger a thorough hazard assessment. Work to understand the reasons for these checks and recognize their safety features.
 - Resist the pull of complacency and stop what you are doing when you notice something is different. Even a small shift in procedure can create a more significant hazard.

For further information on this or any other safety related matter, please contact the [EH&S office](#).