



A Building Scientist's take on: methods, myths & mistakes Paul LaGrange



IAQ Radio+ returned to Cajun Country this week to learn about construction methods, myths and mistakes from renowned building scientist Paul LaGrange. Mr. LaGrange is a master forensic investigator for moisture and energy movement in both historic and new homes located in the hot humid Gulf Coast Southern region of the US. LaGrange Consulting has been providing energy efficiency solutions for builders and homeowners since 1999. They are a full-service consulting company specializing in energy efficiency, indoor air quality, and sustainability in residential and small commercial buildings.

Paul also works as an expert witness for legal cases related to building science and is a building science educator at the LaHouse Resource Center at LSU in Baton Rouge, Louisiana. If that is not enough Paul is also a Former Contractor with over 20 years of building experience and enjoys sharing his experience on his WWL radio show, through his Paul's House referral network and through his blog.

Paul is well known in Building Science circles as an excellent Cajun Chef and makes a mean Gumbo, as anyone that has attended The Annual Westford Symposium on Building Science aka “Building Science Summer Camp” over the past decade will tell you.

Nuggets mined from today’s show:

Listeners learned through case studies about diagnosing building science issues related to air and moisture in materials, evaluating methods to fix mistakes, and construction myths particularly in hot humid climate zones!

To improve the comfort, efficiency, value of the homes he was constructing, homebuilder Paul LaGrange turned to Building Science.

Historically, one way of passing down knowledge and craftsmanship was from father-to-son. Paul found that the children of knowledgeable tradesmen have not followed in the footsteps of their fathers and found it harder to get knowledgeable subtrades.

He started LaGrange Consulting in 1999-2000, to spread Building Science knowledge through seminars and courses.

Paul retains home building licenses and insurance. To focus his efforts on Building Science he pivoted from home building to consulting. Paul has become a highly respected Building Science forensic investigator.

Shortly before Hurricanes Katrina and Rita; Paul was sought after to host a weekly radio show; where he answers questions about problems encountered by homeowners. There were many problems as repair contractors relied upon the same methods and materials to repair all properties ranging from historic to modern. He feels honored by the opportunity. Most common questions are seasonally related: why is my floor cold, why are my wood floors cupping, my heater is running-why is my home damp and cold during the winter, condensation around windows, my AC is running but my home is still uncomfortable?

Numerous callers searching for service provider recommendations was the impetus for his creating paulshouse.com, a 24/7 website where consumers can find service providers whom Paul trusts.

Case Study Slides: [If you are interested in the case studies, we strongly suggest that you watch the show on YouTube.]

Paul gets hired to see what isn't working rather than what is working.

Valued engineering, trying to save money (e.g. tightening homes) during renovation can exacerbate prior conditions.

Moisture source control is important, bathrooms and kitchen cooktops. He advocates use of fans controlled by humidistats.

HVAC system design and installation is very important! High efficiency HVAC equipment will not overcome poor system design and installation.

Customer induced problems, in summer homeowners set thermostats below outdoor dewpoint draws moisture into the home.

Cupping wood floors is a big problem in Louisiana. The flooring industry needs to develop finishes that allow moisture vapor to permeate through. For unfinished wood floors, Paul recommends beeswax or tung oil. When possible, he recommends doing something underneath, e.g. covering the soil and adding dehumidifiers to make the area semi conditioned. Spraying polyfoam or added foam board to bottom of joists and taping and sealing seams and edges.

Historic homes in Louisiana were built without insulation or air barriers. Window AC units were used for cooling prior to HVAC. Updating adds HVAC and insulation. HVAC isn't dehumidification!

Many older homes in Louisiana have only 1 or 2 cold air returns. Closing doors for privacy adversely effects comfort and interferes with air circulation.

As an expert witness, Paul has learned not to use the terms mold or fungi, alternatively he refers to visible mold/fungi as organic growth.

Laziness and stupidity slide- flex duct bathroom exhaust placed near attic roof exhaust fan.

Installs and maintains filtering dehumidifiers in conjunction with Wifi data loggers in attics and crawlspaces. Every 6 months: changes filters, puts drain tablet in condensate pans, changes batteries on data loggers.

Air conditioners are not dehumidifiers.

Grand Isle, Louisiana. Some geographies require extreme moisture control and dehumidification (desiccants).

Air-sealing.

Multiple layers of house wrap.

Proper flashing techniques and materials.

Protect the structure first. On historic homes, the use of Slicker Rain Screen, and Styrofoam insulation panels inside walls during retrofit. Do this prior to electrical and plumbing rough-in!

Graphic photos of wooden siding, OSB turned into what looks like “shredded wheat” due to poor window installation, improper flashing, and absence of drainage plain.
Drainage planes

Weep screed

Paperless drywall

Not all homes are candidates for spray foam insulation. When spray foam is used, its important to use enough of it (cover joists, rafters, roof decking). Active and continuous air barrier.

Paul’s experience is that Chinese drywall remediation in which affected areas of homes are gutted, vulnerable metals removed (HVAC, plumbing & electrical) and paperless drywall installed have generally proven effective.

Paul likes it when CIHs are involved with forensic building science investigations.

Round-Up with Restoration Global Watchdog Pete Consigli:

The case studies of lessons learned provide added value to IAQ Radio broadcasts.

The new generation of restorers need to learn building science.

When building science was first introduced to disaster restoration, it was assumed that the water restoration guys would be most interested. Conversely, the group most interested in building science was the old school fire restoration repair contractors. Building science is valuable in chasing hidden fire residues and odors.

Moisture mob group passing on what they know.

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Some great IAQradiop testimonials on the chat:

"Wisdom coming from IAQ Radio is unmatched and amazing." - Tom Martin

"The case studies are the meat and potatoes of IAQ Radio." - Don Weekes

"Thank you Cliff, Joe, Jon, Pete and Paul for a great show. My "hats off" to you for continuing to give us a great variety of shows related to building science, restoration, indoor air quality and the need to "do things right" for our projects and buildings. Keep up the good works!" - Mickey Lee

Z-Man signing off

Trivia question:

Heat transfer is when thermal energy travels from one object to another. Name the 3 ways in which this occurs?

Answer:

Conduction, Convection & Radiation

Answered by: John Lapotaire, Sanford, FL