



IAQ RADIO+

Show Number: 779 BLOG

Ralph Moon, PhD

Life and Times of a Building Scientist and Restoration Researcher

Good day and welcome to IAQ Radi+ episode 779 blog. This week welcomed Ralph Moon, PhD for a show titled the “Life and Times of Building Scientist and Restoration Researcher”. Dr. Ralph Moon is an authority on the forensic side of the insurance claims industry, particularly regarding his work on "Duration of Loss" and the physics of moisture impact on building materials. He has a rare combination of experience, education and opportunity that led to a consequential career in IAQ, Building Science and Disaster Restoration. Learn more this week on IAQ Radio+.

Ralph E. Moon, Ph.D. is the Owner of Ralph E. Moon Consulting LLC., an insurance services company that investigates water-related damage for insurance claims. Previously he managed the Building Sciences Department and GHD Services in Tampa, FL. He is a Building Scientist with more than 40 years of consulting experience in the areas of duration of loss studies, risk assessment, project management, industrial hygiene, and indoor air quality assessment.

Dr. Moon has published 65 peer-reviewed papers and 40 technical articles and is a frequent expert witness on insurance-related claims and projects. He has a unique background that combines extensive field experience, teaching, research, and legal services in IAQ, building science and disaster restoration. Dr. Moon is a graduate of Western Michigan University and the University of South Florida.

NUGGETS MINED FROM TODAY’S EPISODE:

Building Science Career Journey

Ralph Moon, a building scientist with over 40 years of experience, discussed his career path from biology to building science and disaster restoration. He shared his academic background, including studies in red algae (*Eucheuma*) and red tide research, which led to his interest in mold and fungal inhibition. Ralph explained

how he transitioned into the restoration industry after he encountered mold problems while working for a Florida Government Agency and became curious and wanted to learn more about mold. Ralph attended a MEHRC (Mid-Atlantic Environmental Hygiene Resource Center Course) in Philadelphia taught by building scientist Joe Lstiburek and microbiologist Chin Yang.

Ralph attended a mold course in Orlando where he encountered attorneys discussing “good mold and bad mold” and realized that a niche existed to explain microbiology to people who didn’t understand it.

Ralph worked for D.H.S.A. where he managed the environmental department and was frustrated by stringent government regulations and lack of opportunity for him to work creatively. Ralph was a partner with the founders of HSA Engineers and Scientists where the initial goal was 100 insurance claims a month. Starting with one claim per week the business grew to hundreds per month over 15 years.

What do you consider the most significant blind spot that the industry has finally corrected?

Ralph discussed the ongoing challenges in the restoration industry, particularly regarding the continuous education of employees about evolving science and broader perspectives on mold and microbiomes. Ralph explained that while walking in the woods we are exposed to countless microorganisms and that natural exposure doesn’t pose a risk. Due to media generated fears, some seek to live in a mold-free environment which is impossible when we are intimately in contact with other living organisms both inside and outside our homes.

Why research duration of loss?

Ralph attended a conference where he presented research on the effects of water damage on wooden baseboards over time. Public adjusters in the audience; threatened by Ralph’s findings, began arguing with him. From the public adjuster’s reaction to his research, Ralph realized that opportunity for this research existed.

He explained his research on the "duration of loss," which aimed to scientifically determine how long building materials had been wet, inspired by his work during Hurricane Katrina and the concept of a "body farm" for building materials. Ralph

shared that his research, including 65 peer-reviewed papers and 40 technical articles, is available on his website (<https://www.ralphmoonphd.com/>) and through various publications, and he encouraged interested parties to reach out to him directly for more information.

Material Durability Research Discussion

Ralph credited his boss for allowing him to use the profits from his department to fund his research. Ralph acknowledged the contributions of colleagues who volunteered thousands of hours doing research. Ralph discussed his research on material durability and duration of loss, explaining that scientists couldn't predict results and found unexpected stability in some materials like galvanized metals, while others like concealed cabinet door hinges showed rapid deterioration. As the study outcomes were unpredictable Ralph and his colleagues found the research process to be fun.

Why is duration of loss important?

Insurance policies cover sudden events and short-term duration losses. Damage to kitchen cabinets caused by a slow, long-term faucet leak are often not covered losses. Time is a critical element of damage causation.

Tile Tapping

Ralph described a tile tap testing method used to evaluate mechanical bond strength between ceramic tiles and underlying surfaces, noting that most tiles behave similarly and the best tapping tool is a metal ring or truck aerial. When tiles are tapped, well bonded tiles emit a high pitch sound while unbonded tiles emit a dull sound. This sound was characterized by recorded tap responses obtained during the first 5000th of a second. Research found that while the primary cause of tile debonding is related to installation, extremes of temperature can cause tile separation.

Ralph opined that installing ceramic tiles over vinyl floors doesn't work.

Observations during new home construction

During new construction it's common for lumber to be stored uncovered onsite. Solid timber and exterior plywood are forgiving while OSB and other materials are prone to swelling and loss of strength.

Wins some and loses some.

Ralph's most satisfying experiences are when he is given the opportunity to explain failure and duration. Ralph doesn't always win his cases and has found that juries often are sympathetic to homeowners. Ralph's testimony is always: truthful, science based and honorable.

Examples of important lessons learned in the field?

In the lab causation by a single factor is studied while in the field additional contributing factors must also be considered (e.g. the age of the property, normal wear and tear, etc.).

Pharmaceutical Plant Restoration Project

Ralph discussed his most satisfying restoration project, which was a 15-year effort to remediate water and chemical contamination at a pharmaceutical plant in the Bahamas.

What percentage of Ralph's cases end up in court?

Ralph explained that 85% of claims are paid without contest, with only about 10% reaching court, and shared advice for testifying as an expert witness, emphasizing the importance of honesty and engaging with the jury.

Humorous incident

Ralph also recounted a humorous incident where he swallowed a fly during a presentation.

Tips for testifying at trial

Ralph refers to testifying in court as "the theatre of law". Be animated and visually engage the jury. Simplify complex concepts with simple demonstrations.

Satisfying consulting projects

When Ralph is the 4th or 5th person to visit and solves the mystery of negative pressure using smoke tubes to visibly demonstrate his findings. Exhaust fans can have an immense negative impact on a home.

Does it matter whose side you are on in a legal case?

According to Ralph plaintiffs' attorney strategy is driven by their advocacy for their clients and insurance carrier's strategy are driven by interpretation of the insurance policy.

Artificial intelligence

Discomfort and fear often come along with new technology. Ai is being used to provide distinct opinions on loss and repairs. Ai can lower administrative claims costs. Ai may reflect the motivations and bias of the trainer.

Ralph discussed his experience with AI in legal cases, noting both its potential benefits for clarifying interpretations and its current limitations, including errors in deposition transcription. Ralph is encouraged by Ai, he doesn't fear it, he recommends caution and the need for human oversight. Ralph noted that he has tens of thousands of loss duration photos and that perhaps Ai could answer questions about them in milliseconds.

RoundUp

Pete Consigli, Global Restoration Watchdog and Industry Historian

- Pete Consigli reflected on Ralph's contributions to the restoration industry over the years, including a presentation on cleaning mold contaminated clothing and praising his ability to simplify complex principles for broader understanding and his significant impact as an expert witness.
- Ralph shared that meeting Joe Lstburek had a huge and positive impact on his career.
- Patent Lawsuit. Pete and Ralph discussed Ralph's experience as an expert witness in a patent lawsuit involving heat drying technology in the restoration industry. Ralph explained that the case ended in a draw, with the judge focusing on defending the patent rather than determining its validity. They also discussed the broader implications of the lawsuit for the industry, including concerns about unproven technology and the importance of scientific testing.
- Pete asked about Ralph's experience with the Moisture Mob, to which Ralph expressed his honor at being a member and his enjoyment of working with passionate industry professionals.
- CIRI Conference and Professional Development Ralph discussed his work with CIRI, the science research arm of IICRC, and mentioned an upcoming

conference in September in Las Vegas featuring topics like smoke exposure, spacecraft cleaning, and art restoration.

- Pete highlighted the importance of curiosity in professional development, drawing parallels with Bill Gates' hiring practices at Microsoft.
- Pete mentioned curiosity and enthusiasm being key performance indicators of great employees.
- Ralph advised young people entering the restoration industry to find a niche that excites them, become enthusiastic about their work, and share their findings with others.
- Ralph Moons contact info: RalphEMoon@gmail.com

Z-Man signing off

Trivia Question: As recognized by the International Astronomical Union (IAU): what is the official name of the earth's natural satellite?

Answer: The Moon

Answered by: Todd DeMonte, Sun Prairie, WI