THE ENGINAIRE

MONTHLY NEWSLETTER

SEPTEMBER 26, 2023

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OCTOBER 4, 2023

WELCOME NEW MEMBERS

We have 2 NEW MEMBERS so far this year! Everyone welcome:

1. Dustin Easterly from Airetech
2. Thomas Robinson from Arkansas Children's Hospital

EVENTS

1. Our **Annual Fall Golf Tournament** is coming up on **October 27th** at **The Country Club of Arkansas.** If you are interested in playing and/or sponsoring contact Josh Robinson at jrobinson@harrisonenergy.com. The tournament sign-up form is attached to this email.

2. Arkansas ASHRAE has partnered with the Arkansas Association of Energy Engineers. The **Annual Energy Summit** is coming up on **November 1st** from **8:00 a.m.-6:00 p.m.** at the City Center (315 N. Shackleford, Little Rock, AR 72211). Tickets are $100 BUT AEE has been nice enough to give us a coupon code (**36seer2**) to use and it makes the tickets only $75.00 To register and take a look at the speakers click here.

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2023 ENERGY SUMMIT

Arkansas Association of Energy Engineers and ASHRAE Arkansas announce the 10th annual Energy Summit and Trade Show.

Wednesday November 1, 2023

City Center
315 N. Shackleford Road Little Rock, AR 7221

presenting sponsor TRANE

Association of Energy Engineers

ASHRAE arkansas

arkansasashrae.starchapter.com

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Our YEA committee is hosting a tour and tasting on **October 20th** at **4:00 p.m.** at Rocktown Distillery. There are only 18 spots available. To RSVP email Blake Beckham asap at: blake.beckham@victualic.com. If you aren't a part of the 18 spots there will be an open Happy Hour starting around 6:00 p.m. To read more click here.

Women in ASHRAE are hosting a kick-off event on **October 12, 2023** at **4:30 p.m.** at the **Flying Saucer** (323 President Clinton Avenue, LR, AR 72201). Bring a friend and enjoy an all women networking event with drinks. RSVP to India Beavers at ibeavers@insightpllc.com.

The **Arkansas Boilers Association** has quite a few events coming up. Definitely would be worth looking into. Their current **LIFETIME membership** is **$50**. To get in on the membership and check out the events click here.

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STUDENT ACTIVITIES

We have ALOT going on with our Student Activities.

1. The **2024 Winter Conference** is coming up in **January** in **Chicago, IL.** The applications are now open for the ASHRAE Student Travel Grant to help you get to the conference. Applications are due **September 30th.**
2. Each year the **ASHRAE Foundation** awards scholarships of up to **$10,000.00** each to qualified students. There are 52 scholarships available this year. To apply **click here.** Applications are due **December 1st.**
3. The **Undergraduate Program Equipment Grant** application is now open. Grants shall be used to fund equipment and supplies for undergraduate projects and 2-year technical school projects that focus on ASHRAE-related topics. Grants may cover projects lasting from one academic term up to one year. To apply **click here.** Applications are due **December 15th.**

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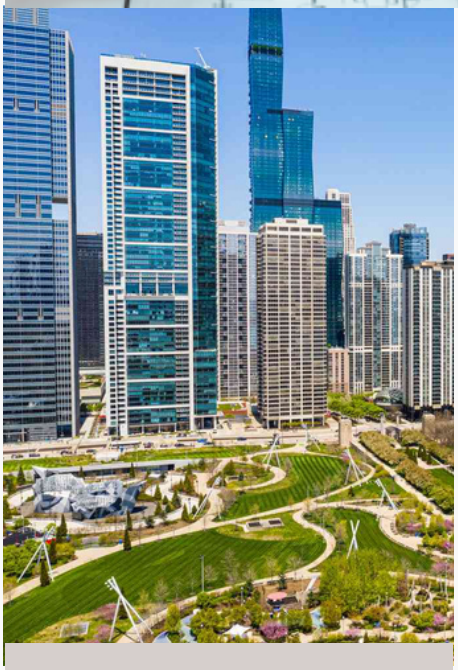

STUDENT ACTIVITIES

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STUDENT TRAVEL GRANT

Submit by:
Sept
30th

ASHRAE WINTER CONFERENCE
Chicago, IL- Jan 20th - 24th

Travel to ASHRAE Winter Conference and be exposed to:

- Student Activities Committee meetings (non-executive session)
- The Student Program
- Seminars
- AHR Trade Show
- Technical Committees
- Governance

APPLY HERE

arkansasashrae.starchapter.com

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ASHRAE HISTORY

William F. Wells: Eccentric Genius

Russell Black, Arkansas ASHRAE Historian

With the COVID-19 pandemic dramatically impacting world history, it would be proper to honor ASHRAE, and specifically William F. Wells, for their integral contributions to epidemiological science. Wells, who for several years was the Chairman for the American Society for Heating and Ventilation Engineers' *(the precursor to ASHRAE)* subcommittee on Air Sanitation, is the originator of the Airborne Droplet Nuclei Hypothesis of Disease Transmission. And Wells, a comprehensive genius, not only developed the hypothesis, he created the instrumentation *(the Air Centrifuge)*, the conceptualization *(Wells Curve)*, the mathematical modeling *(the Wells-Riley Formula)*, and finally, the experimental design *(the Baltimore VA Experiment)* to definitively expostulate and prove the Droplet Nuclei Hypothesis. In addition, Wells' creative scope extended to the remediation of the problem, proposing and demonstrating the effectiveness of UVGI for air sanitation. Prior to Wells, direct contact, including direct droplet spread, was considered the only route of microbial contagion, and the airborne transmission of disease was considered incorrect, at best, and bunkum, at worst: "Bacteriology teaches that former ideas in regard to the manner in which diseases may be airborne are entirely erroneous…." *(Charles Chapin, Sources and Modes of Infection, 1910).*

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Bucking this prevailing idea, it was Wells' profound insight which clarified and subjected to science earlier vague notions of the air transmission of disease. Wells was the first to scientifically discriminate the phasic difference between the mechanical ejection of microbes through air versus the airborne transmission of microbes via air. Wells described the first phase using Newtonian mechanics where the coughing and sneezing of microbial ejection and transport were governed by the forces of mechanical expulsion and gravity. The second phase was his Droplet Nuclei Hypothesis where the dynamics were governed by localized forces of molecular collision between air molecules and micro-particles *(Droplet Nuclei of encapsulated microbes)* where the Droplet Nuclei were suspended for extended time frames. In the Droplet Nuclei Hypothesis, the localized molecular collisions superseded the general gravitational forces, allowing the encapsulated microbes to be transported by air to infect indirectly.

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Here is a short list of Wells' milestone events in the development of his Airborne Droplet Nuclei Hypothesis:

1931 – Invention and Patenting of the Air Centrifuge *(used to sample air for microbial content)*

1933 – Presentation of the Airborne Droplet Nuclei Hypothesis

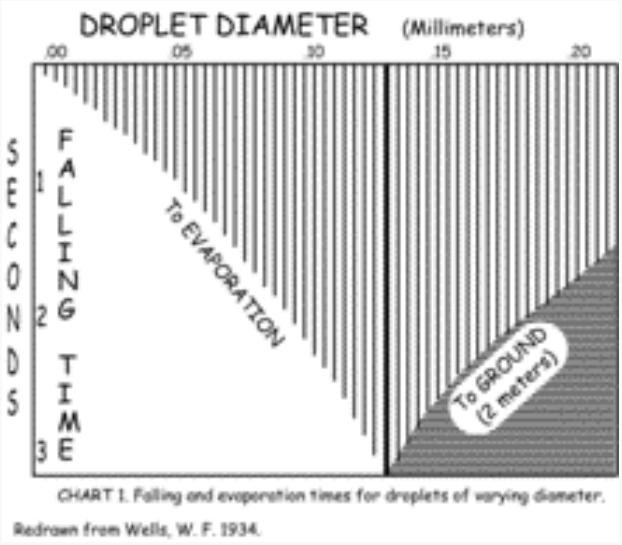

CHART 1. Falling and evaporation times for droplets of varying diameter.
Redrawn from Wells, W. F. 1934.

1935 – *(With Fair)* Demonstration of the effectiveness of UVGI to inactivate airborne microorganisms

1937 – *(Wells, et al.)* Experimentation of Upper-Air UVGI to stop epidemic spread of measles in Philadelphia suburban school

1956- 1962 – *(Wells & protégé Riley)* Famous Experiment at the Baltimore VA exposing Guinea Pigs to air originating in a TB ward, definitively proving the Airborne Droplet Nuclei Hypothesis.

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As far as Wells' genius still affecting us today, all present epidemiological practices surrounding airborne transmission of disease are stamped by Wells' contributions. The 6-foot social distancing practice is a direct descendent of the reality of the Wells' Curve. The Wells-Riley equation is still the fundamental template for mathematically modeling airborne disease transmission.

Transmission – Wells-Riley Equation

$$C = S\left[1 - \exp\left(-Iqpt / Q\right)\right]$$

- C = new infections
- S = number of susceptibles
- I = number of infectors
- q = number of infectious doses
- p = pulmonary ventilation rate per susceptible
- t = exposure time
- Q = flow rate of uncontaminated air

In sum, the Airborne Droplet Nuclei Hypothesis and its experimental confirmation, the Air Centrifuge, the Wells' Curve, the Wells-Riley Formula, and the use of UVGI to sanitize air streams are all the lasting scientific legacy of this "eccentric genius" *(as Wells was described by his chief protégé Richard Riley)*.

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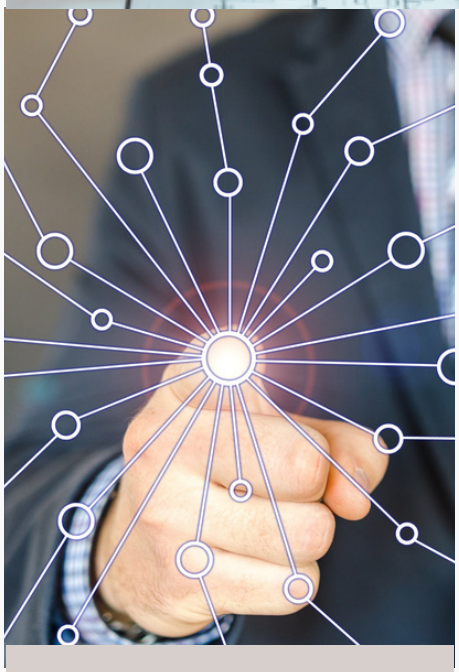

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SOCIAL MEDIA

Did you know our chapter has a **Facebook**? We are working on keeping it updated with meeting information, event details, new members and much more. If you don't follow us you can find us by searching: **ASHRAE Arkansas**. Follow us, like our post and keep an eye out for some ASHRAE swag giveaways!

NEXT MEETING

Mark it on your calendar. Our next meeting is October 4, 2023 at the Red and Blue Event Venue starting at 11:30 a.m. We want to challenge everyone to bring one new person OR one member who maybe hasn't been to a meeting in a few years Click here to register.