AMERICAN MEDICAL WRITERS ASSOCIATION
Delaware Valley Chapter

DELAWRITER

The quarterly newsletter of AMWA-DVC

Delawriter Editors

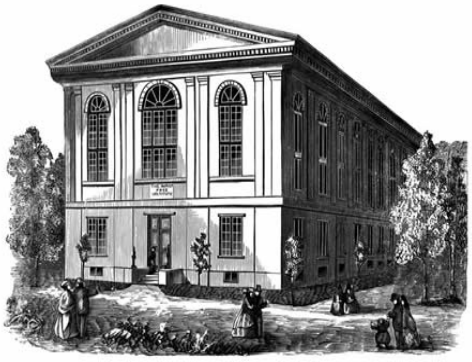
Fall Edition, 2020

You Complete Me

By Stephen Drehobl

On September 30, 2020, Dr Scott Gilbert gave a virtual talk called "You Complete Me: A Symbiotic View of Life" at the Wagner Free Institute of Science in Philadelphia, PA. His discussion on the human microbiome pierced the illusion of our individuality. "The biology of the 21st century," he said, "shows that we are not merely individuals; we are biomes, collections of numerous integrated ecosystems." The microbiome affects our health in novel ways and can play a significant role in immunology and disease.

Microbes play a crucial role in human development. Through natural childbirth, the mother passes microbiota to her child, which provides acquired immunity. Babies born by C-section have a less diverse microbiome, which delays the immune system's development. However, these babies are not vulnerable forever, as exposure to the environment and the microbiome adapts over time. The human microbiome is always in flux and can change every time we eat, drink, breathe, or interact with the world.
Hospitals appear to be clean environments, but can be breeding grounds for antibiotic-resistant microbes. The overuse of broad-spectrum antibiotics has led to bacterial resistance and has disrupted the relationship with the microbiome, causing disease. While antibiotics kill harmful microbes, they can also destroy the host's microbiome.



The Wagner Free Institute of Science

When the microbiome can no longer protect its host, opportunistic infections like C. difficile can take hold and be challenging to treat. Procedures like fecal transplants, while straightforward and low-tech, have been very effective in helping these patients rebuild their microbiome and fight off opportunistic infections.

The human microbiome can also affect how the body interacts with drug treatments. The microbiome plays a role in pharmacokinetics by breaking down the drug into different metabolites. The microbiome contributes to the health of the individual and can affect the patient's clinical response. In immunotherapy, a healthy microbiome has been shown to **improve treatment efficacy**. Higher diversity of microbiota in fecal specimens of patients initiating immunotherapy has been associated with improved progression-free survival. Patients who eat more fiber, fruits, vegetables, and whole grains increase their beneficial, fiber-fermenting bacteria. As a prebiotic and food source for these bacteria, dietary fiber may also influence systemic immunity. More work needs to be done to understand the role of the microbiome when treating disease.

Humans are not individuals: we are holobionts. Each of us is a collection of organisms, all of which work together to make up a single organism. Our microbiome is as much part of us as is our cells' DNA. The microbiome plays a role in developing our immune system, protects us from opportunistic infections, and can affect drug interactions in our body. As Dr Gilbert concluded, "We are a part of the environment, just as the environment is part of us."

The Wagner Free Institute of Science is a Victorian-era natural science and history museum located in North Philadelphia. Its dual mission preserves scientific history and educate the public with **free virtual events** and courses during the pandemic.

Stephen Drehobl is pursuing a career in medical communication and scientific writing. He has extensive experience in video

In This Issue

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Quick Notes

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Send your interest to volunteers@amwa-dvc.org.

Quarterly Quotes

"Books open your mind, broaden your mind, and strengthen you as nothing else can." William Feather

Quarterly Pun

"Statistically.... 9 out of 10 injections are in vein."

production and creating content for print and broadcast. He is currently enrolled in the Professional Science Master's Program in Scientific Writing at Temple University and is looking for new writing opportunities.

The Changing History of Radiation Therapy

by Victoria Ramirez

On October 14, 2020, the **Mütter Museum** in Philadelphia, PA and the **Museum of Nuclear Science & History** in Albuquerque, NM held a joint event titled "Healing Energy: Radiation Therapy Yesterday and Today." The virtual event featured two panelists, Jeffrey Womack, PhD and Joanna Fair, MD, PhD. Dr Womack is the author of the recently released book, *Radiation Evangelists: Technology, Therapy, and Uncertainty at the Turn of the Century* (ISBN 978-0822946090). Dr. Fair currently practices radiology as an Associate Professor of Radiology and Nuclear Medicine at the University of New Mexico School of Medicine. The evening focused on the history of radiation and its medical uses for diagnosis and interventional treatment.

Womack discussed the early uses of radiation. He focused on the element radium, which was discovered by Marie Curie in 1898. The immediate applications of the glowing radium and other radioactive materials were quickly realized. The German physicist Wilhelm Roentgen discovered a new form of radiation in the late 19th century. This "x" radiation could pass through many materials that absorb visible light. The mysterious "x" contained radioactive particles that were not yet understood, but later led to the "x"-ray machine. This primitive technology held incredible potential but inherent dangers. Handling radium or exposure to its radiation created burns when making x-ray images. However, scientists realized that radiation could be used to purposely alter the body for clinical benefit.

Curie conducted the first studies treating neoplasms using radioactive isotopes. Early skin cancer treatments bound radium to the lesions on the patient's skin. For other tumors, surgeons sutured the radium rods in the tumor for direct exposure to the healing radiation. This therapy was effective in shrinking tumors but held risks. To understand the risk and as an ethical provision, Curie would bind radium to her skin as a control. Curie realized the risks of radiation too late, as she died from its effects.


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of
Radium Water
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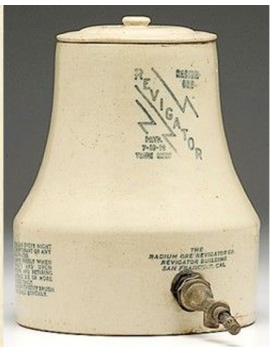
OLIVER O. WALLACE
WILLIAM HOFFMAN
JACK HIBBARD
W. E. KELSO
GEORGE HUTCHINS
Ask Them!
They and Hundreds of Others Are Learning That
"Revigator"
MEANS NEW LIFE



The public was fascinated with radium and other radioactive elements, and the marketplace found new uses for these miracle molecules. Radium was used in luminescent paint for glowing dials on wristwatches. Despite being told that the paint was harmless, workers in watch factories eventually developed radiation poisoning. Radium was advertised as a powerful elixir in health magazines. Salesmen sold water coolers with radium cores to doctor offices. People believed that the glowing radium was "perpetual sunshine" that harnessed the power of the sun. These drinks were marketed to improve patient energy and vitality, similar to today's energy drinks.

Fair noted that we have all benefited from imaging in medicine and dentistry, which gives rise to some radiation exposure. Fair discussed that, today, the use of radiation requires considerable regulation and controlled studies. Breakthroughs using therapeutic radiation are being developed in nuclear medicine, which uses trace amounts of radioactive atoms for diagnosis and treatment. Radiotracers using labelled glucose or oxygen allow us to see the cellular physiology within a tumor. Positron emission tomography (PET) scans, in conjunction with computerized tomography (CT) scans, can show these physiologic changes with anatomical imaging to help diagnose and stage solid tumors.

The future of nuclear medicine is theranostics, the combination of therapy and diagnostics. The goal is to use radioactive molecules for the diagnosis and treatment of a given disease. While one radioactive atom can find the tumor to help diagnose cancer, the radioactive molecule can be swapped out to treat the same tumor. The challenge is to identify and radiolabel target molecules that bind specifically to tumor receptors. Using radiolabeled drugs to identify and target cancer cells provides a novel mechanism to treat cancer, much more advanced than Curie's early treatments. Fair noted that modern medicine has successfully used novel radioisotopes to treat cancer and other diseases, despite the negative association of radiation.

In a laid-back and enjoyable evening, the Mütter Museum and the Museum of Nuclear Science & History provided an informative history of radiation treatment. Together, Womack and Fair provided clarity in the evolution of early practices using radiation to its use in modern medicine today. With more developments on the horizon, the future of radiation therapy remains bright -just like that radium rod glowing in its water jug.

Victoria Ramirez is a student in the Professional Science Master's Program in Scientific Writing at Temple University. Victoria looks forward to a career in publication writing.

Academy Conversation Addresses "Apocalyptic" Climate Crisis and Importance of Science Communication

by Emily Kovach

It is no secret that the planet's climate is changing, but the effects on its inhabitants are more urgent than just warming, as major health impacts arise. These negative impacts are facilitated by disease spread, resource

scarcity, and natural disasters. In the wake of this year's natural disasters, the Drexel University affiliated Academy of Natural Sciences hosted a digital panel discussion titled "Natural Disasters, Extreme Weather, and Climate Change" on September 29, 2020. The panel included Drexel's Associate Professor of Chemistry Ezra Wood, Associate Professor of Biodiversity and Environmental Science Beth Watson, and doctoral candidate Steve Mason, explored the heavy - and often bleak - implications of our rapidly changing climate and discussed the best ways to inform the public.

Environmental catastrophes of 2020 have included raging wildfires, category 4 hurricanes, deadly heat waves, record rainfalls, and unprecedented melting of Arctic ice. These extreme weather events point to unsettling state shifts - transitions in ecosystems caused by large perturbations in in our environment, according to Wood. These state shifts are no longer an abstract concept of times to come; they are now happening in real time. Marked by instability and apocalyptic climate events, state shifts are a foreboding sign that the world is changing, and fast.

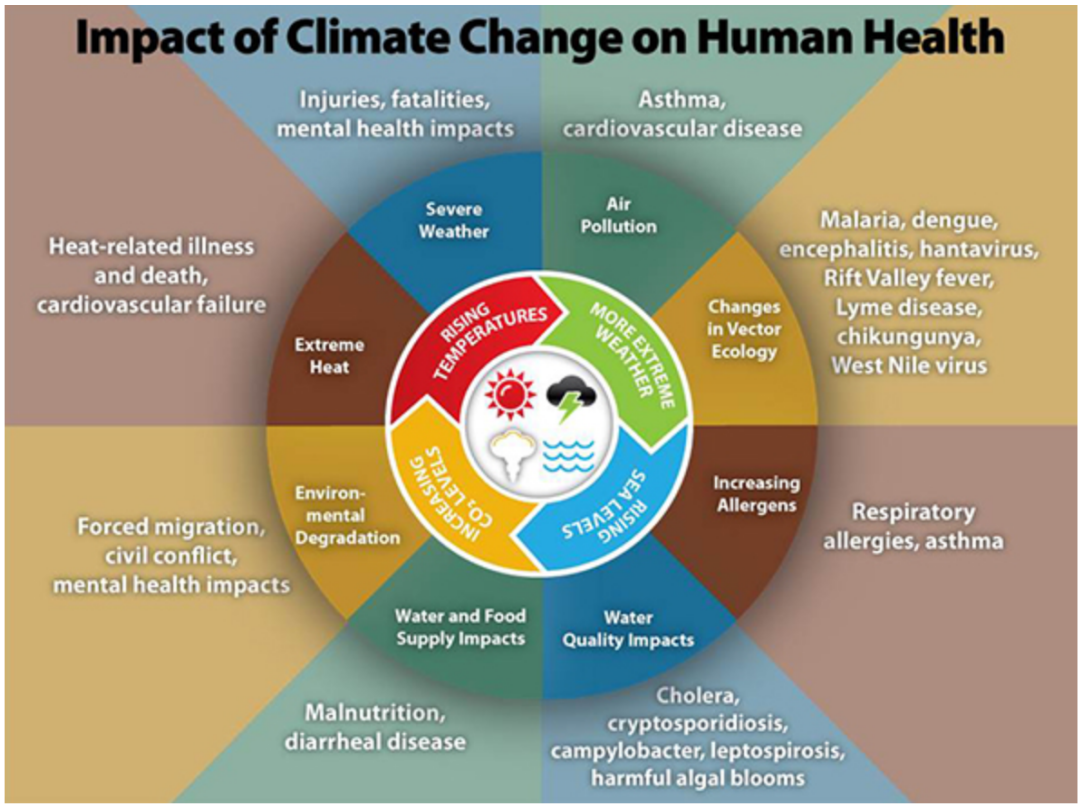
"Climate change is here," Wood said. "And it's just getting started."

The Human Toll

The toll on human health is only beginning to take shape, while the rate of climate change and its environmental impacts accelerate. Each panelist echoed the same sentiment: resource scarcity is going to worsen, and air pollution is going to become an even bigger problem. That is only a glimpse, however, of the problems we face. According to the Centers for Disease Control and Prevention (CDC), there are numerous impending threats associated with climate change (Figure 1).

These threats are far-reaching and range from immediate to long-term health effects of varying pathology. Air pollution, wildfires, and extreme temperatures exacerbate cardiovascular disease and respiratory illness. Increasing allergens and vector-borne diseases pose deadly risks to our immune systems that may fail to keep up. Food (in)security and contaminated water can cripple communities and their ability to sustain themselves. Negative impacts on mental health will likely follow, as conflicts and forced migration increase. There will also be downstream effects on the economy, agriculture, and sanitation which could lead to loss of income, stability, and hygiene at a cost of 2 to 4 billion USD in the next ten years, per the World Health Organization (WHO).

In short, climate change is going to wreak havoc on human health and our way of life, as much as it will ecosystems and the environment. As Watson notes, "these things are going to disproportionately affect certain communities." Communities in certain geographic locations - like the coast - will be hit the hardest, as will communities with unstable infrastructure and insufficient healthcare. Vulnerable populations, like the elderly and disabled, are even more susceptible, even though we will all face some consequences of climate change.



A graphic from the **Centers for Disease Control and Prevention** detailing the different impacts of climate change on human health. Rising temperatures, extreme weather, rising carbon dioxide and sea levels will have detrimental effects of human health, leading to disease, conflict, and death.

Communicating the Path Forward

We have always struggled to effectively communicate science to the general public, due to complex scientific principles and technical jargon. With scientists frequently willing to communicate only among themselves, this gatekeeping has often left the public behind in scientific discussions. Many individuals are intimidated by

science and do not engage in these discussions. The serious nature of climate change requires that we start. Watson, Mason, and Wood say that the path forward is to improve science education and effective communication of climate science.

Wood recommends a more comprehensive science education for the public. People are often quick to dismiss the idea of a 1-2oC increase in global temperatures, without realizing the devastation this temperature increase will cause. By addressing the unnatural anthropogenic acceleration of our changing climate, proper science education can dispel misconceptions about climate change and increasing temperatures as being natural phenomena.

Watson emphasized the need for audience empathy, especially with climate justice and marginalized communities. The Climate Justice movement emerged out of the unequal effects of climate change. The movement centers on the idea that the effects of climate change are as inequitable as they are destructive. Certain geographic aras are more prone to flooding, hurricanes, or wildfires, and low-income communities and communities of color are hit harder. To effectively communicate the danger of climate change, we need to make science more personal and relatable.

Mason argued that not every scientist is effective at communicating science. Some groups, such as the CDC and WHO, have been successful in communicating science by presenting information to the public in accessible forms. By using easily understood language and infographics, these organizations are bridging the gap between scientists and the public. Climate change scientists and advocates must use these approaches to engage the public about climate change and downstream effects on public health. We are at a critical time to share these risks, so we may act in time to invoke change. When speaking about better communicating these challenges, Watson said, "The key is rethinking the way we're doing things, we have to."

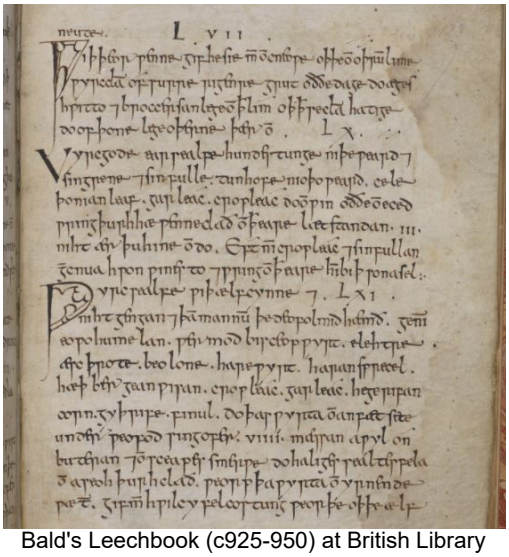
Founded in 1812, the **Academy of Natural Sciences** promotes research in global issues with a focus on biodiversity, evolution, and environmental science. The Academy hosts programs and events for scientific education and discussion.

Emily Kovach is receiving her Master's Degree in Biology at Temple University. She looks forward to opportunities in science communication.

Culinary Tales for Your Ails:The Secrets of Historical Recipe Books

by Viola Brown

The Mütter Museum hosted an event called "Culinary Tales for Your Ails, The Secrets of Historical Recipe Books" on October 6, 2020. The moderator, Chrissie Perella, spoke about the museum's collection of handwritten recipe books. The recipe books shared practical knowledge about preserves, meals, and baked goods, but also contained recipes for household cleaners and natural medicinal remedies. These handwritten documents of medicinal cures were passed down through families for generations.



Bald's Leechbook (c925-950) at British Library

During the 18th century, women in the American colonies preserved this English tradition and authored their own recipe books. Women authored recipes to treat common diseases of that time using available natural ingredients. Perella shared some recipes from Elizabeth Coates Paschall, which were written between 1749 and 1766. Coates came from a prominent Philadelphia Quaker family, and her book contained a recipe for a medicinal elixir called **Stoughton's Bitters.** In 1712, Reverend Richard Stoughton invented this treatment to relieve gout and reduce inflammation and pain. These bitters were one of the first medicines to receive a British royal patent. Coates adapted the recipe to include native plants and local ingredients from the Americas. Over the years, Stoughton's Bitters has changed from a medicinal remedy to an added aromatic in whiskey cocktails.

During the 19th century, the recipe books in the collection evolved in content and authorship, containing more treatments and fewer recipes. Several books in the collection were handwritten by physicians and contained treatments for specific ailments and instructions for their administration. Exact measurements, weights, and precise formulations were used to develop remedies. For an earache, exact measurements of 3 ounces of sweet oil, two drops of Sassafras oil, and 1 ounce of opium were mixed, and drops were placed in the ear canal. In 1849, an unknown physician from Lancaster County documented precise weights and measures in his formulations, and modified the dosing of the medicine based on the patient's age. His medicinal recipes were written in Latin, and the formulations used apothecary symbols. By 1847, the **American Medical Association (AMA)** was established as a standard for scientific advancement, medical education, and medical ethics for better public health. The information previously found in these recipe books was now documented in medical papers. Treating disease became a more exact science.

Modern researchers have evaluated the efficacy of these medicinal cures. Perella discussed a 1,000-year-old recipe in their collection and in the British Library from **Bald's Leechbook**, which contained an Old English eye salve treatment for bacterial eye infections. In 2015, a team of researchers from Nottingham, England, recreated the antimicrobial "**Bald's Eye Salve**" by combining garlic, onions, leeks, wine, bovine bile, and brass, which was incubated for nine days. Harrison et al tested the Bald's eye salve using soft tissue infection and chronic wound in vitro models. The remedy killed established S. aureus biofilms in tissue infections and methicillin-resistant S. aureus (MRSA) in chronic wound models.

These recipes from ancient texts and passing down of written information for generations have provided treatments for more than a millennium.

Viola Brown is enrolled in the Professional Science Master's Program in Scientific Writing at Temple University. She has extensive experience in patient care and is pursuing a career in writing educational materials for patients and caregivers. She is seeking internships and other writing opportunities.

UPCOMING EVENTS

AMWA-DVC Bookworm's Holiday Networking Social on December 16th

AMWA-DVC Virtual Holiday Party December 16th from

AMWA-DVC is hosting a Bookworm's Holiday Networking Social via ZOOM on Wednesday, December 16, 2020 from 7:00 pm tp 8:30 pm. Network with your friends and colleagues while sharing your book recommendations in the book-themed breakout networking sessions:

- Biography and memoir
- Cookbooks
- Fantasy and science fiction
- Health/medicine
- Humor
- Romance

Registration is $5 and sign up for preferred book genre breakout room. Register **here**.

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