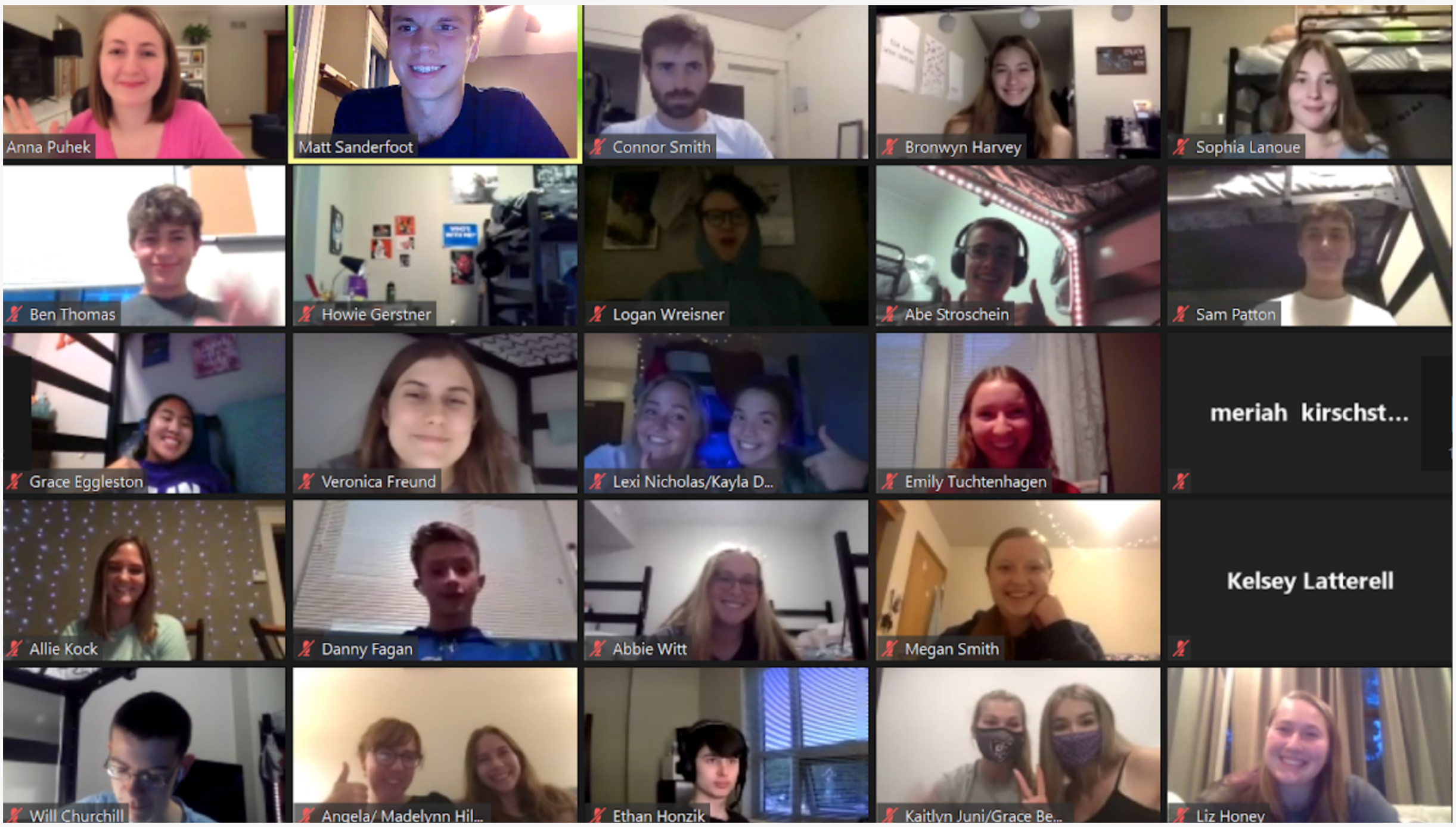
The Scholars Newsletter



2021 April Edition

The Aquinas Scholars Honors Program

Editor: Ashley Burt

UNIVERSITY OF St.Thomas

End of Year Updates

Upcoming Events:

Bring Your Pet to Zoom Day

When? Wednesday, May 12th

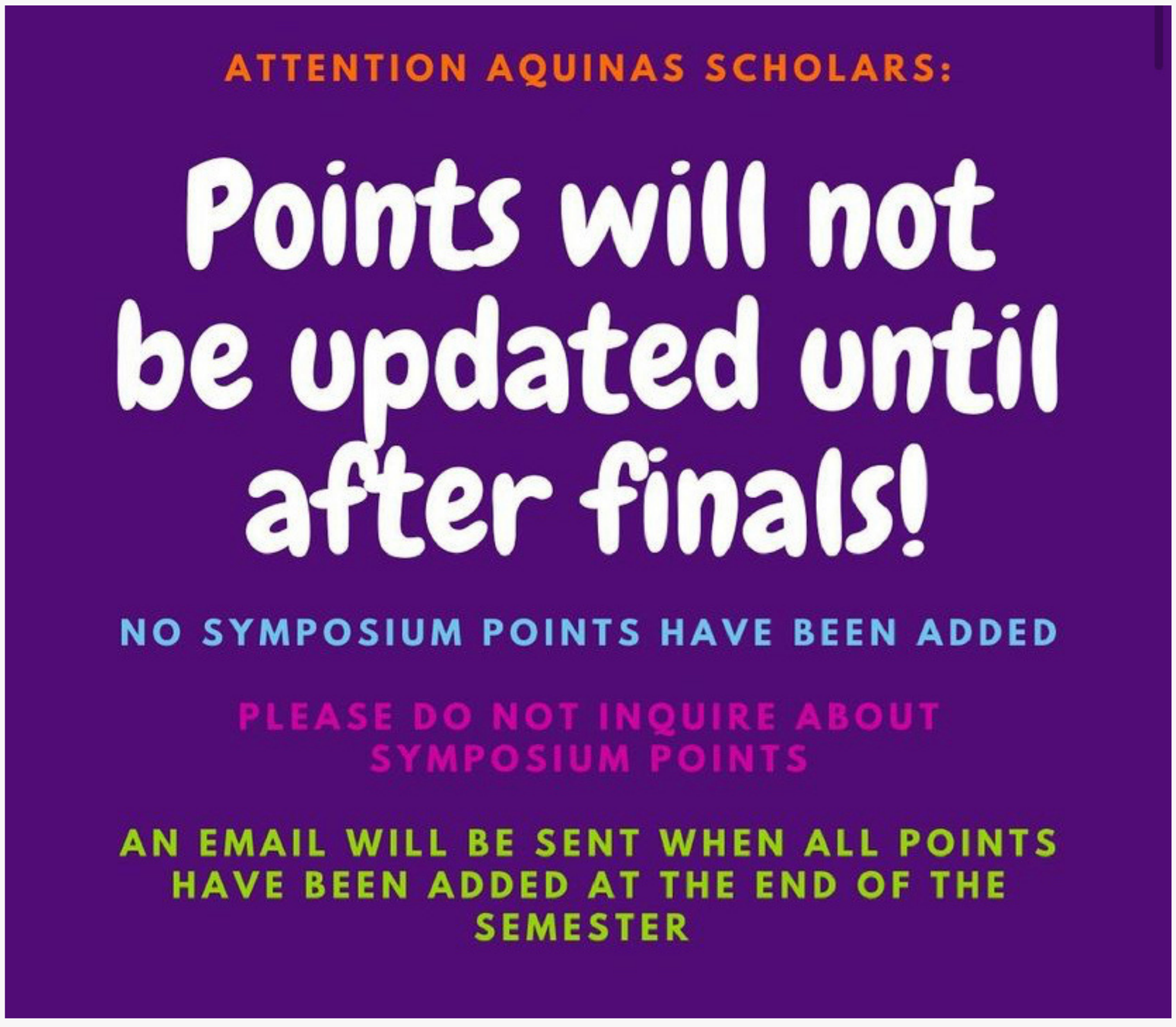
Where? Zoom link can be found on Canvas page

Book Review and Summary Due

When? Sunday, May 15th

What? Just submit a review of a book you enjoyed reading this past semester!

Important Announcement:



Scholars Journal

I Saw a Cloud

Scholar: John Michels

I saw a cloud

That looked like your face.

It stood in your grace as it cast a shroud of darkness on me.

As it shone in the sky above,

It made sure I saw its height over mine.

And so, I stare blankly at the sky

In awe of your stance,

Asking, how can I live like this?

In a crowded room you could not find me.

I would hide away and sink into the voices echoing against the walls.

The cloud passes but I still see you,

I still feel you.

Like a foam mattress laid on for too long.

Your presence remains and your breath haunts me.

Your body lies with such weight

But how lively your specter is.

The mark you left on this world remains ever so vigorous.

I should feel happy but instead I feel small and helpless,

But I will continue.

I will continue.

Scholars Journal

Explorations in Art History
Scholar: Jane Ude

I recently attended a presentation titled, “Fake or Fortune: Who Decides What Art is Worth?” by Colleen Boyle. In the presentation, Boyle discussed the economics of art both in the past and the present through her experience as an art appraiser. It was very interesting hearing what a St. Thomas alumna has done with her degree.

Although I did not know much about art or economics, Boyle made these topics easy to understand and intriguing. There were a few aspects of the economics of art that I had seen before in movies and film: for example, two people overbidding the price of the artwork because of their egos. It was a bit funny to think that those dramatic scenes could actually take place in real life. However, there was even more that I did not know about the economics of art. I had no idea how much goes on in the international market for art and how many countries are a part of it. I was happy to hear that the art community was trying to diversify their investments in artists. I am glad that they are considering the artwork of people of color and women, as they deserve that attention.

Learning about how COVID-19 affected the art market was very eye-opening. Throughout the pandemic, I have seen how widespread the effects were; however, I never thought about how the art world was hit by it. I was surprised to hear that different generations of buyers were affected by the move online quite differently. Although I knew that younger generations, like millennials, do more online shopping, I did not realize how much online shopping would deter the older generations from collecting art.

Scholars Journal

I was surprised to see how art and economics can also intertwine with my field of study: science. There are various parts that are put into play to determine if a piece of artwork is real or forgery. It made me want to learn more about how that part of the industry came to be and get more scientific detail in the process of testing artworks. I liked being able to see the interdisciplinary work; it makes what I am learning in my major and in this class more tangible and connected to the real world.

Scholars Journal

Chloramphenicol Acetyltransferase

Scholar: Logan Lindell

While drug resistance is not new, it has become an increasing global health threat, largely in part due to the overuse and misuse of antibiotics over many years (Levy, 2000). Bacterial resistance to antibacterial drugs has risen, causing populations to be vulnerable to many potentially deadly infections. Consequently, this emergence and spread of antibiotic resistance has resulted in increased morbidity, mortality and cost of health care (Hellinger, 2004). Antibiotic resistance also has the ability to spread through improper disposal methods. One antibiotic, known as chloramphenicol, has resulted in many antibiotic-resistant bacteria such as Escherichia coli, Klebsiella pneumoniae, Proteus mirabilis and Shewanella algae because of high levels of pollution in rivers and sewage processing plants (Dang, 2007). In each of the chloramphenicol resistant strains, a chloramphenicol acetyltransferase gene was detectable. With this being said, studies on the abundance, diversity and mechanisms of chloramphenicol acetyltransferase are necessary for future control and prevention of antibiotic resistance.

Typically, chloramphenicol works by stopping bacterial growth by stopping the production of proteins. It is able to diffuse through the bacterial cell wall and bind to the bacterial 50S ribosomal subunit (Kleanthous, 1984). When it binds to this sub-unit, chloramphenicol interferes with peptidyl transferase activity, hence preventing the transfer of new amino acids to growing polypeptide chains. Chloramphenicol acetyl transferase in the resistant bacteria prevent this from happening by catalyzing the transfer of an acetyl group from acetyl CoA to the primary hydroxyl of chloramphenicol. In turn, this prevents chloramphenicol from attaching to the 50S ibosomal subunit and allows for bacterial protein synthesis

to continue (Roidis, 2004).

By studying the structures and mechanisms of chloramphenicol acetyl transferase enzymes from different bacterial species, a greater understanding for how to prevent chloramphenicol resistance can be obtained. There are three main types of chloramphenicol acetyl transferase enzymes: CATI, CATII, and CATIII. Despite CATI being the enzyme with the broadest clinical significance, its understanding is almost entirely based off of studies done on CATIII (Goodale, 2020). By using pentapeptide scanning mutagenesis, a library of random insertions would be able to be generated in both CATI and CATII in order to characterize the peptide insertion sites and gain a better understanding of their structure and function within the enzyme. This analysis would pinpoint regions of the different chloramphenicol acetyl transferase enzymes that may serve as targets for the design of inhibitors that prevent the spread of chloramphenicol resistant pathogens (Goodale, 2020).

Currently, chloramphenicol is very toxic and seen as a last resort for treating bacterial infections such as meningitis, plague, cholera, and typhoid fever. However, because of its high effectiveness, chloramphenicol has the potential to be considered as a treatment for common respiratory tract infections, particularly in developing countries where the need for treatment is very high. Furthermore, studying the structures and mechanism of different chloramphenicol acetyl transferase enzymes (CATI, CATII, and CATIII) will help achieve a better understanding for how to prevent the spread of more chloramphenicol-resistant bacteria in the future. Preventing the spread of any antibiotic-resistant bacteria is crucial in maximizing the effectiveness of antibiotics around the world, especially in developing regions.

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Contact Us!

Cheyanne Simpson, President

simp1139@stthomas.edu

Connor Glinski, Vice President

connor.glinski@stthomas.edu

Megan Smith, Webmaster

megan.smith@stthomas.edu

Ashley Burt, Publications

burt4116@stthomas.edu

Dr. Eric Fort, Faculty Director

ehfort@stthomas.edu

Erica Berglund, Administrative Assistant

berg7582@stthomas.edu