Knox College Convocation Address
9/15/2025

My name is Mark Shroyer and I am Professor of Physics and chair of the Department of Physics and Astronomy.

New students and colleagues welcome to Knox.
Returning students, faculty and staff, welcome to a new year.

When I received the invitation to speak, I was a bit nervous (and still am). This is not the kind of speaking that I do and I was a bit uncertain. I wondered "what should I speak about?"
Well, we are at a nationally ranked Liberal Arts institution, perhaps "What is a liberal arts education?"
So of course I promptly went to google AI and asked. I received:

"A liberal arts education offers a broad, well-rounded curriculum across disciplines like the humanities, arts, social sciences, and natural sciences. Its goal is to provide a comprehensive foundation of knowledge and develop intellectual skills such as critical thinking, ethical reasoning, and creative problem-solving. Rather than focusing on vocational training, liberal arts programs prepare students for diverse career paths and informed civic engagement by equipping them with the ability to analyze complex issues from multiple perspectives."

And while I don't *really* know where AI got this information, I did attended a liberal arts institution and I have been teaching at Knox for over two decades. I do have some expertise to assess AI's answer. I don't think it is hallucinating and this sounds pretty good….so… I think I'm done.

But Melissa said I had to speak for more than 60 seconds. When I need a clear head, I often take a walk across campus, take in the fresh air and admire these trees. So let's talk a bit about trees this morning.

During the pandemic, I really got into gardening. In recent years I have planted a few fruit trees. Growing fruit trees requires a very different mindset. They take a while to establish. One must think in terms of years, reflect on healthy, incremental growth, perhaps some pruning and focus on long term goals, delayed gratification. And with patience, some of my trees are beginning to bear fruit. But currently my fruit trees are young and small in stark contrast to the largest trees in my yard.

Just across the north boundary of my backyard is an enormous Maple tree. The maple connects me to my former neighbors Chuck and Mary Gibbs. Chuck graduated from Galesburg High School in 1944, served in the army during WWII and graduated from Knox '50. Mary Gibbs, an exceptional musician, graduated from Knox in '51. She taught piano at Knox for some years and taught private lessons out of her house well into her 80s. My daughter and son were among her last piano students. While my son continues graduate studies in clarinet music performance, he pays his bills right now with piano. Thank you, Mary! Chuck and Mary lived in that house for over 60 years. Chuck was fond of saying that when they moved into that house he could easily wrap his arms around that giant maple, a tree whose girth is now nearly 10 ½ feet.

In my front yard stands a tulip tree, one of the tallest trees in Galesburg. Its circumference is a monstrous 16 ½ feet and, with a homemade sextant and a little trigonometry, I calculate its height to be 125 feet. It is a monster and it's old.

The tulip tree is about the same age as another amazing tree just over my southern property line, a giant Ginkgo. I vividly remember the fall of 2005 (my first year at Knox). As I left for work on a particularly crisp fall morning, there was this odd sound. It was a clear day, no wind, but it sounded like light rain. I looked at the Ginkgo, and it was raining leaves! I'd never seen anything like it. I subsequently learned that, following the first hard frost of the season, it was typical for the Ginkgo to rapidly drop its leaves.

Now you don't need to come to my house for this experience, because the sister to this magnificent tree lives to my right just outside Seymour Library. Fall trees in the midwest are beautiful to be sure, but the Ginkgo puts on a unique show. When that particular frosty morning occurs this fall, take a moment to bathe in its shower of leaves.

That Ginkgo, like so many of the oldest trees in our Knox/Galesburg community, was planted by John Van Ness Standish.
Prof. Standish moved to Galesburg in 1854 to teach mathematics and astronomy at Lombard College, though in his 41 years there he taught *every* course offered. He established the horticulture Society in Galesburg and they planted many, many trees. In fact, across the street behind me is Standish Park, which he established over 150 years ago.
Standish was a significant benefactor to Galesburg and to Knox College during his life and when he passed away, he left his entire estate to Knox. His legacy is all around us if we know where to look.

It is undeniable that I feel a connection to trees and things made from them.
I inherited a set of hand made dining room chairs from my grandparents, made from walnut lumber harvested from my great grandmother Swingle's farm near Kirksville, MO. The chairs connect me to my grandparents, especially my grandmother Esther. Now Esther's mother, Grace, was a fierce advocate for education. At that time, nearly a century ago, she felt that education was a critical way in which women could protect themselves and secure independence. She ensured that Esther and her two sisters all went to college-the first in their family to do so. Esther went on to be the Mercer Co librarian for over 30 years. I remember fondly accompanying her to work, wandering the stacks, reading for hours, exploring the boundaries of my imagination. I was raised to view books as a treasure. A tree was sacrificed to tell an authors' story or to share their wisdom. Respect that gift. Esther, like Grace, was an advocate for education. All three of Esther's children, including my father, went to college. My three siblings and I all went to college. My children went to college and are pursuing graduate studies.
My antique chairs are a constant reminder of this educational legacy that can be traced back to Esther and Grace.

Also in my dining room on the buffet are numerous beautiful and sentimental wood pieces of art made by my stepfather, a skilled wood turner. These include: my son's memory box made from the Mulberry tree from the house in Atlanta where we lived when he was born
and
an urn for our first family dog Katie made from a branch that fell from the Tulip tree.

And I am not alone in this connection.

Not long ago I was listening to B. A. Parker, the host of CodeSwitch on NPR. In this episode she was inviting descendents of enslaved people to consider what responsibilities one has and how best to honor one's ancestors. A heavy invitation. Parker and her mother traced their lineage back to their first American ancestors, ancestors enslaved at the Somerset Place Plantation in North Carolina. Descendants of those enslaved at this plantation have held reunions since the 1980s. Those unrelated by blood but by ancestral trauma referred to each other as "land kin". To be sure, descendants express a range of perspectives about visiting the plantation for a reunion. But for some this experience was powerful and allowed for the formation of a unique sense of community. They viewed the trek as a way to honor their enslaved ancestors.

Parker's interview with Mina Wilson was particularly moving. Quoting Mina:

> *"It is a spiritual experience when I visit…The first time I was leaving I was walking away and I kept feeling like something was pulling me from behind and …I turned around and I looked at these tall cyprus trees … and it was like I saw them (my ancestors)… and they were so grateful. "*

Later we learn that these rows of cypress trees were all planted by their enslaved ancestors making Mina's connection through the trees to her ancestors all the more poignant.

This was a powerful episode and I certainly don't do it justice in my short telling. The takeaway for *this* talk is that Mina's articulation about her connection, via trees, to those that came before her resonated with me and stimulated some new avenues of thought.

I've spent some time speaking about individual trees, but let me take a moment to speak about the collective impact of trees on earth. If you have not seen a graph of atmospheric levels of CO2 vs. time, let me paint the picture. The Scripps Institution of Oceanography has played a pivotal role in helping us understand the history of CO2 levels, collecting data from all over the world. The particular graph I'm referring to involves data taken over the past 70 years on a mountain in Hawaii. Now the graph shows this: Starting in 1957 when CO2 levels were 315 ppm, we observe a steady increase to over 425 ppm today. Perhaps you've heard, this increase is attributed to CO2 (a greenhouse gas) released by fossil fuels, contributing to man-made climate change. (I'd invite you to take an environmental science course if you'd like to better understand the arguments that support this conclusion).

And while increasing CO2 levels are fantastically important, again I will focus on a secondary point. Superimposed upon that undeniable upward trend is an annual oscillation of CO2 levels. This is sometimes referred to as 'the Earth breathing". The cause of these oscillations is the seasonal growth and decay of plant life. Recall from biology that through photosynthesis, plants take energy from the sun and carbon dioxide from the atmosphere to make sugars for the plant and release oxygen to the atmosphere.

At first glance, one can easily understand why there would be a seasonal effect. In spring and summer plants remove CO2 from the atmosphere, in fall and winter as plants die or go dormant, they do not.

But a second look, with some understanding of astronomy, the tilt of the earth, and the complimentary way the seasons work in the Northern and Southern hemispheres, one quickly realizes that when it is fall in the north it is spring in the south and vice versa. One might question: Why should there be an **annual** effect on this oscillation? Why don't the effects cancel?

But a *third* look, with some understanding of geography and the carbon cycle can help us. The vast majority of land mass and thus the vast majority of forests lie in the northern hemisphere. A study of the carbon cycle helps us understand that trees are the most significant terrestrial and seasonal carbon sink on Earth. In short, when one thinks of the "Earth breathing", it is reasonable (if not a touch simplistic) to think of trees seasonally removing carbon from the atmosphere.

Now I'd be remiss if I didn't take a quick detour and share some history. I referred to the Scripps Institution of Oceanography earlier.

If you haven't already guessed, the "Scripps" here is Knox alumnae Ellen Browning Scripps. Ellen was born in London, but raised just about 70 miles south of Galesburg in Rushville, IL. She attended Knox College (one of the few colleges at the time that admitted women), (witnessed the Lincoln-Douglas debate) and graduated with a degree in Mathematics in 1859. After graduation, she returned to Rushville to teach in a one-room school house. When the Civil War ended, she moved to Detroit and joined her brother to write for and help publish *The Detroit Evening News.* Through the 1870s and 1880s, they acquired numerous papers throughout the midwest forming the Scripps Newspaper Syndicate. In 1890 Ellen moved to CA to help care for her sister, and expanded the Syndicate to the west. Later in life, with her amassed wealth, she supported her love of science and education.

In addition to the Oceanography Institute, among the MANY philanthropic endeavors a few of note include:
the Scripps Research facility (a non-profit facility that focuses on research and education in the biological sciences),

Scripps College (a liberal arts women's college in Claremont CA),

and significant support to Knox College which, through the Scripps foundation, continues today.

Ellen Browning Scripps' love of and commitment to science and education has impacted countless students and scientific endeavors at Knox and around the world. Our community will commemorate that legacy on her birthday next month.

Now where was I? Yes, back to the “Earth breathing”.

When I hear that phrase I am reminded of one of my favorite introductory physics problems.
Students, given certain assumptions about the volume of a typical breath and the atmosphere, are asked to estimate the number of air molecules currently in their lungs that were also in Newton’s last breath.

With this simplistic model, one finds that each breath you take has roughly 20 molecules that were exhaled in Newton’s last breath!

So what’s the point of this exercise?

First, to develop the skill of model building and estimation.

Second, to develop the perspective that exactness can get in the way of progress on a complicated idea when approximation can yield excellent insights.

And third, to develop a sense of scale: to understand how incredibly small and fantastically numerous molecules are.

But for me, it does a 4th thing as well. It generates an unexpected connectedness to one of the giants of my discipline. In a small, small way, we are sharing the same breath.

And this brings me back to the carbon cycle and trees “breathing”. In a tree’s 6 month “inhalation” of CO_2 during the spring and summer, the tree converts some of that carbon to structural material. In short, with every “breath” the tree creates a new ring. And with every “breath”, some of the atoms of carbon that make their way to that outermost ring come from you and me.

As fall approaches, the leaves will change and the trees will go dormant. But with spring’s arrival, leaves unfurl, a new breath begins and we will all contribute to the next ring.

Which tree will you look to as a reminder of your connection to Knox?
Mine is the Ginkgo. As I enter the home stretch, let’s return to that Ginkgo tree.

One of the traditions at commencement is the awarding of honorary doctorate degrees generally to acknowledge exceptional contributions to their field, to society or to the college. Knox awarded its first honorary doctorate to Abraham Lincoln in 1860. With his honorary Knox degree in hand, he was propelled 5 months later to the presidency. (And it wouldn't be the last time this would happen for an Illinois senator!) But it seems Lincoln's time at Knox may have preceded the planting of the Ginkgo.

By 1912, this was definitely not the case. In that year, two distinguished people shared the stage and received honorary degrees–Ellen Browning Scripps and John Standish. John, having planted the tree and lived here, was already thoroughly part of the Ginkgo. Ellen, in her return, became part of the 1912 ring. They are part of that Ginkgo tree, as is every student that has stepped foot on this campus, every faculty member that has taught and every staff member who has supported the running of this institution over the past 150 years. And so now will you be. Your carbon will join that of a lasting legacy of those who have studied at or been committed to Knox. We are a part of this community and can choose to share in its legacy.

So, in merciful conclusion I have three points I hope you will take away:
First regarding a liberal arts education:
Let this be a metaphor for the difference between getting a degree and getting an education. One could go through life enjoying the shade a tree provides, the fruit it bears and the shelter its lumber yields, without giving them much thought. Or one can attempt to view trees in the separate and intermingling contexts of agriculture, art, astronomy, biology, chemistry, climate science, geography, history, mathematics, physics, sociology and spirituality (not to mention :ecology, economics, medicine and music to name just those topics I had to cut).

And while AI's answer to the question "what is a liberal arts education was ok, the question I posed earlier to AI is the wrong question. The real question is: "what is YOUR liberal arts education going to be?" And that is *your* question to answer.

Second regarding connectedness:
Students, you will join the thousands of students that have walked these brick sidewalks, that have studied in the red room, that have worn down the steps of Old Main, that have breathed the air shared by the Ginkgo, and you will become part of this campus. Knox will become a part of you and you a part of Knox. The degree to which this happens depends on your fearlessness. Don't let fear of embarrassment or fear of mistakes, or even fear of public speaking, steal your opportunities. Be brave.

Finally regarding legacy:
That Ginkgo has a piece of all of us. When you have a spare moment, I'd invite you to sit underneath that great tree and reflect on the history and legacy it embodies. And reflect on *your* history and the legacy *you* embody.

Whether it was their advocacy for education, their financial support, their encouragement, or nothing more but nothing less than their survival and perseverance, those that came before us helped us get here. To paraphrase B. A. Parker's question, "How do we honor those that came before us? How do we honor their legacy?"

Well that's a pretty tough question for day one of class, so let me offer two answers:
First, we just do the best we can today.

Second, revisit this question tomorrow, next week, next term, or the next time the Ginkgo takes a breath.

Thank you.