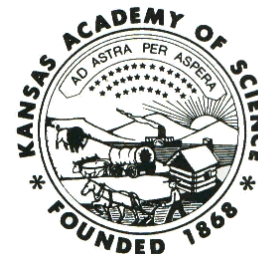


# KAS BULLETIN



## NEWSLETTER OF THE KANSAS ACADEMY OF SCIENCE

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February, 2025

## THE 157<sup>th</sup> ANNUAL MEETING OF THE KANSAS ACADEMY OF SCIENCE APRIL 4-5, 2025 AT FRIENDS UNIVERSITY

This year's annual meeting of the KAS will be held in conjunction with the Central States Entomological Society (CSES) at Friends University on April 4-5, 2025.

On Friday, we will congregate at the renowned Sedgwick County Zoo on the west side of Wichita. The banquet dinner will begin at 6pm in the Cargill Learning Center, but for an extra \$7.00, members can arrive anytime during the day to tour the zoo. The guest speaker will enlighten us about the management of elephant pregnancies and deliveries.

Saturday morning will begin with a continental breakfast sponsored by the CSES on the Friends University campus at 2100 West University Avenue, Wichita, KS 67213. The keynote speaker, Eric Eaton, is the editor of BugGuide.net.

Oral presentations will begin at 10:15am, and posters will be set up just before lunch, which will be held in the Casado Campus Center. Posters will be viewed after lunch, then oral presentations will resume at 2:30pm.

**Registration and abstract submission deadline: March 21, 2025.**

Send abstracts to: [STEM@friends.edu](mailto:STEM@friends.edu).

We encourage students to attend and share their research. Student posters and presentations will be eligible to win awards from both the KAS and CSES. Check the KAS website for more information and registration information.

## Special issue on Biodiversity

by Hank Guarisco, editor

This issue of the KAS Bulletin is devoted to understanding our current biodiversity crisis. What is biodiversity, how do we measure it, how much has been lost in recent times, what are the underlying causes that have sent us from the Holocene into the Anthropocene, and how we can begin to remedy the situation while continuing to cherish our living world?

Unfortunately, we live in a society and economic system that reifies everything around us. A beautiful forest and its living inhabitants become commodities to be used at will, not fellow beings that share the experience of living on this planet. We use GDP (gross domestic product) per capita to compare the well being of countries around the world. The GDP is defined as “the total value of all goods and services produced in a country over a specific period of time.” This measure is used as a proxy for relative poverty or wealth, and hence, the quality of life of its inhabitants.



However, the GDP is often a woeful measure of quality of life, as the following example will illustrate. If a rural family is able to sustain itself by providing food, clothing, and shelter from the land, but produces no goods or services for the market economy, then this family has zero contribution to the GDP. However, if they lose their land and take minimum wage jobs in a factory, these family members are productive members of society because they contribute to the GDP.

The consequence of unlimited growth, as measured by the continual rise of the GDP, leads to increasing appropriation of land, water, and living plants and animals from the natural world. We live on a finite planet, and at some point unlimited growth is simply untenable. However, most of us are not aware that a crisis will soon be upon us. This situation is similar to someone cutting down a large tree. Nothing changes for a long time while the chainsaw cuts deeper into the tree trunk. Eventually, we hear a crack, then a few more, but still the tree has not moved more than an inch, so we assume everything is fine. At the literal tipping point, however, the tree snaps and falls in front of us, and we are shaken by a new reality.

Is this doomsday message just “chicken little shouting that the sky is falling?” Environmentalists since the 1970's have been shouting doom and gloom, but the world is still here. However, during the past several years we have begun to see catastrophic climate warming, radical weather events, dying coral reefs, and a decrease of 70% of vertebrate populations. Many have begun to realize this is a serious situation, while others refuse to admit it, and continue to reap profits from the cancerous growth of our economies.

Will we wake up in time?

## Recent Passing of a Great Scientist: William “Randy” Miller

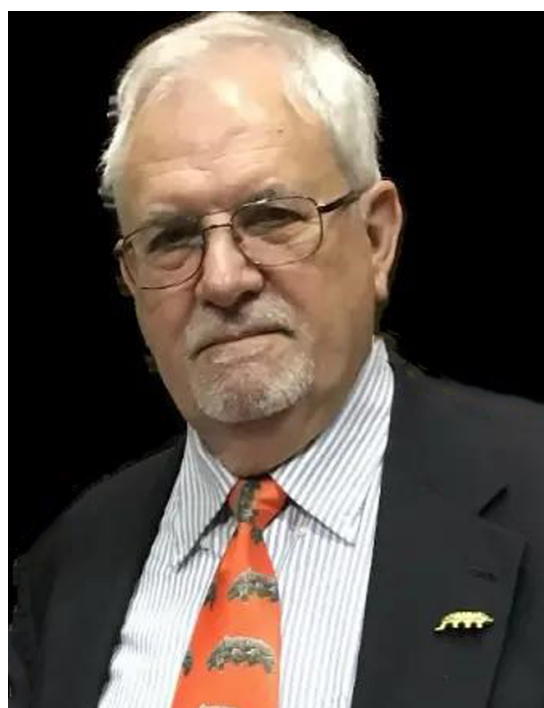
By Hank Guarisco, editor

On the 7th of February we lost a long-time, active member of the Kansas Academy of Science: Randy Miller. He was 80 years old and will be missed. Randy was a mentor to students at Baker University and was best known for his work on Tardigrades, affectionately known as “waterbears.” His love for these amazing creatures was evident in the research presentations he often gave at KAS annual meetings. His 78 publications include many collaborations with students of all ages. For example, a Texas Journal of Science article from 2022 is entitled: “Tardigrades in Texas: Fifth Graders Collaborate to add three new records to the state.”



Although tardigrades are minute animals of no commercial value, they are famous for being almost indestructible in their dormant stage. At one KAS meeting, Randy told us how tardigrades survived the harsh conditions of outer space, and when returned to earth and continued to thrive. Tardigrades may truly be the first space travellers! Randy also put together a creative research project examining the tardigrade fauna of tree canopies. Since this research involved using ropes to climb into the canopies, handicapped students in wheel chairs were also able to participate.

I will miss his ready smile and enthusiastic conversations. His students’ oral and poster presentations were always a highlight of the KAS annual meetings. When I think of Randy, I think of creativity.



Randy Miller 1944 - 2025



## Book Review: The Serviceberry by Robin Wall Kimmerer

By Hank Guarisco, editor

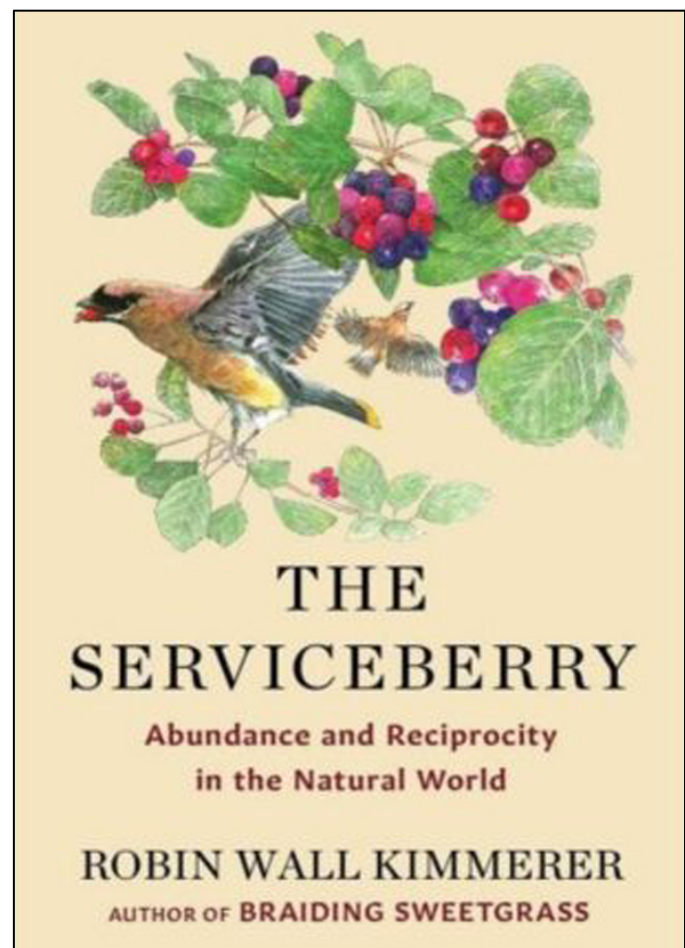
I love this small, 112-page book written by the author Robin Wall Kimmerer, best known for her previous volume, “Braiding Sweetgrass.” Her captivating imagery and ebullient writing style brings life to her wise words.

The serviceberry (*Amelanchier* sp.), also known by other names such as Juneberry, sugarplum, and Saskatoon, produces an abundance of reddish-purple berries eaten by birds, deer, moose, and people. It has traditionally been used to make pemmican, the original energy bars. “They taste like nothing a grocery store has to offer: wild, complex with a flavor that our body recognizes as the real food it’s been waiting for. I can almost feel my mitochondria doing a happy dance when I eat them.”

The prime message of the book is mentioned early, and echoes through subsequent pages like a clear, musical note. The way we view these berries and all of nature’s gifts shapes the way we treat the world – as bountiful gifts or commodities. Are they relatives or resources? A culture of gratitude leads to the realization “that your life is nurtured from the body of mother earth.” This attitude leads to a deeper understanding of the intricate, beautiful relationships among all living beings, including ourselves. Climate catastrophe and loss of biodiversity are consequences of our unsustainable taking from nature. We must cultivate an economy of gratitude.

In the gift economy the currency is gratitude, which yields a sense of reciprocity - giving in return. This is different from bilateral exchange where there is an obligation which is discharged as a reciprocal payment. While prevailing economic theory holds that people are selfish and resources are scarce, therefore competition and hoarding are the norm; Nobel Prize winning economist, Dr. Ostrom, has shown that trust and collective action and cooperation leads to the well-being of people and the land without degrading commonly held resources. Ecologists have also begun to revisit previous assumptions of competition in the natural world. Trees in a forest share resources via connecting mycelia underground. Altruism can be explained by kinship selection.

If the earth is viewed as a big warehouse filled with commodities, there are no moral constraints on consumption. However, if the land is a gift and some living being gives its life to sustain yours, then consumers have moral obligations in





receiving this gift. Unwritten guidelines followed by indigenous communities include the following: introduce yourself, ask permission before taking, take only what you need, never take more than half, don't waste what you receive, and share it. Give thanks and reciprocate as best you can. In native culture, a monster called Windigo is one who has an insatiable hunger, is afflicted by greed, and who hoards and consumes much more than he needs.

The author's personal reflection: "I lament my own immersion in an economy that grinds what is beautiful and unique into dollars, converts gifts to commodities in a currency that enables us to purchase things we don't really need while destroying what we do." Market economies demand abundant, freely available, earthly gifts be converted to commodities and made scarce by privatization and high prices, for example, bottled water.

There is a good analogy between our current economy and pioneer plant communities that take advantage of an opening in a tropical rainforest by rapidly invading and competing for space in the sun. After this resource is diminished, a more mature forest slowly begins to grow and pushes out the pioneer species. Eventually, our embrace of unlimited growth and resource consumption will lead to real scarcity, resulting in drastic consequences for us and all of nature. We can choose a different economy. "Intentional communities of mutual self-reliance and reciprocity are the wave of the future, and their currency is sharing." In addition to sustaining us physically, the gift economy feeds us emotionally and spiritually by fostering relationships with our neighbors. This is very different than buying something on Amazon or in the store.

This is a call to action. "I have some family members who have taken this a step farther. They live in an urban neighborhood where there are plenty of curmudgeons growling at kids to stay off their lawns. So they converted their once tidy little yard to a garden of berries and patches of flowers and put up a welcome sign for the kids in the neighborhood to come on in and find a handful of berries and pick a bouquet to take home. They converted their 'private' yard to a common space. The currency of this gift economy is relationship, and a neighborhood where people know each other's names, even the curmudgeons. The Tragedy of the Commons became the Abundance of Community. This is gift economy in reach of everyone. It's subversive and delicious."



# **WEALTH Day 2025**

By Hank Guarisco, editor

## **Introduction**

On February 10, 2025, organizations interested in supporting the quality of our **Water, Energy, Air, Land, Transportation, and Health**, converged on the Kansas State Capitol building to share views on upcoming legislation concerning these issues with state legislators. The day began with a prayer from the faith traditions of four leaders of KIFA (Kansas Interfaith Alliance): Rabbi Moti Reber; Monsignor Swetland, president of Donnelly College; Lutheran pastor, Reverend Sheri Elwood; and Reverend Jerrell Williams of the Mennonite tradition.

The WEALTH day sponsors showcased their organizations at designated tables in the capitol rotunda. A list of some of the groups represented includes: LETUS (Lawrence Ecology Teams United in Sustainability), Sierra Club, Kansas Permaculture Institute, Climate and Energy Project, The Resilient Activist, FREEC (Flint Hills Renewable Energy & Efficiency Co-op), Audubon of Kansas, Kansas Rural Center, Northern Flyer Alliance, Kansas Wesleyan University, Kansas Citizens Climate Lobby, US Department of Energy, Metropolitan Energy Center, Bethany House & Garden, Prosoco, League of Women Voters of Kansas, the Green Party, Kansas Democrats, and Topeka Collegiate.

Some of the house and senate bills that were discussed include: HB 2113, more funding for water programs; SB 93, statewide election of the members of KCC (Kansas Corporation Commission); SB 170, allowing the KCC to make recommendations on energy efficiency in buildings; HB2149, parallel transmission for distributed energy generation; SB 86, expanding passenger rail in Kansas; HB 2121, increasing annual fees on electric and hybrid vehicles; expanding Medicaid in Kansas; and lastly, HB 2063, state funding for Conservation.

At lunchtime, we sat in a room adjacent to the rotunda and shared a wonderful meal catered by Robin Naramore of Lawrence. As usual, the chicken salad and vegetarian sandwiches were superb – a real treat for all the participants.

## **Visiting WEALTH Day Sponsors**

After the prayer and a brief summary of the proposed policies mentioned above, we adjourned to our tables in the rotunda to visit with one another and answer questions from visitors, including Lawrence high school students. Thad Holcombe and I hosted the LETUS table and explained our mission as a consortium of faith communities interested in educating and advocating for the earth – environmental sustainability and eco-justice.

It was heartwarming to see what other people across Kansas have been doing to further understanding of the natural world and limiting earth's destruction. Kansans for Conservation is a broad coalition of diverse organizations, which include the Kansas Farmers' Union, the Kansas Farm Bureau, Audubon of Kansas, the Sierra Club, LETUS, the Kansas Rural Center, and many others. Its main focus is to establish a state conservation fund to support biodiversity and healthy environments for Kansas land, including parks and agricultural and ranch lands.

The Sierra Club informed the public about the on-going box turtle races that are happening across the state, and what removing these long-lived (up to 100 years of age) animals from their habitat is doing to population numbers. This conjured to mind short stories by Mark Twain. I was unaware that this

destructive practice has continued into the 21<sup>st</sup> century. Although it may not appear as barbaric as rattlesnake roundups, box turtle populations have plummeted due to this practice.

Audubon of Kansas encouraged planting native vegetation to help birds.

The Citizens' Climate Lobby had literature urging for the reform of America's clean energy permitting process, and is lobbying for a Kansas Energy Office that would develop a state energy plan. Kansas is one of a few remaining states that does not have an energy office.

Bethany House & Garden in Topeka has been the home of the Episcopal Diocese in Kansas for many years, and currently has a prairie and pollinator garden, a culinary food garden, a chapel, and a spiritual life garden, which are sources of education, healing, and transformation for members of the general public.

Topeka Collegiate is a private, not-for-profit, independent, elementary school that emphasizes independent learning and creativity, community engagement, and environmental awareness. Conservation of our natural world begins with our youth.

The Resilient Activist is an organization that promotes respect for all life, reconnecting with nature, revamping spending practices and energy allocation, and taking care of ourselves in these ecologically trying times.

Kansas Wesleyan University announced its Heartland Rodale Institute Farmer Training Program (RIFT), which equips participants with the knowledge and skills essential for success in farming while being good stewards of the land. This was also the message of the Kansas Permaculture Institute featuring almost a dozen lectures and workshops on permaculture. The Kansas Rural Center also helps communities grow healthy food with the least damage to the environment.

The Northern Flyer Alliance promotes public rail transportation, known as the Heartland Flyer Extension, from the Dallas-Fort Worth, Texas region to connect with Amtrak at Newton, Kansas. Trains are a much more efficient means of travel and produce fewer emissions than gasoline-powered motor vehicles.

The Office of Energy Efficiency & Renewable Energy of the US Department of Energy, the Metropolitan Energy Center promoted alternatives to conventional energy, such as biodiesel. The private company, Prosoco, featured its environmentally safer cleaning products.

Flint Hills Renewable Energy and Efficiency Co-op (FHREEC) is a group of volunteers who host "sunraisings," similar to barnraisings in the Amish community. A homeowner buys solar panels from FHREEC, and friends get together to install them on the property. A huge lunch is provided for everyone on the day of the sunraising. These are wonderful, community events where people come together to promote solar energy at a reasonable cost. I have met some very interesting individuals at these affairs.

## **Conclusion**

After participating in WEALTH DAY, it is abundantly apparent that a whole lot of seeds are being planted so we Kansans can live healthy, sustainable lives in harmony with our local environment and the natural world beyond. I look forward to working with many of these groups in the coming year, and meeting again to promote these worthy goals in 2026.



## **Book Review: Feather Fashions and Bird Preservation, A Study in Nature Protection by Robin W. Doughty**

by Hank Guarisco, editor

I chose to review this book, published in 1975, because it is a prime, historic example of the human exploitation of nature, subsequent outrage over the consequences of this exploitation, and what was done to successfully stop it. Many important lessons can be learned by visiting unpleasant chapters of our collective history regarding our treatment of each other and of the natural world.

Before reading this book, I was unaware that approximately one hundred years ago, a significant portion of our bird fauna was under the threat of extinction because of clothing fashions. In this country, species such as egrets, cranes, herons, gulls, terns, roseate spoonbills, and pelicans, just to name a few, were relentlessly hunted for their plumes. Breeding colonies of terns along the northeastern shores of Massachusetts, Long Island, New Jersey, and Virginia were favorite targets. In 1884, a New York businesswoman, who had promised to deliver 40,000 bird skins to a Parisian millinery firm, paid hunters to kill as many terns on Cobb Island, Virginia as they could manage.

Because of our predilection for following European styles in clothing, it should come as no surprise that the same passion for feathers was also in evidence across the pond. Birds from exotic, colonial regions in Africa and southeast Asia were also exploited. These included: ostrich, herons, egrets, hummingbirds, albatrosses, and birds of paradise, just to name a few. The numbers are truly staggering. Extracts from London Auction Sales show that from 1904 to 1908, 155,000 birds of paradise were sold; 152,000 hummingbirds exchanged hands from 1904 to 1911; and 1,125,000 egrets and herons were traded from 1897 to 1911! Seabird colonies on remote atolls in the Pacific were especially vulnerable. An estimated 300,000 albatrosses and terns were taken on Lisiansky Atoll in 1904, and an equal number poached from Laysan five years later.

Because birds are such a visible part of nature, and their songs and colorful presence have delighted people throughout the ages, their wholesale destruction for financial gain raised a bitter outcry among diverse segments of society. Early sentiment for protecting birds is evident in the writings of the famous botanist, William Bartram (1739-1823) and the ornithologist, Alexander Wilson (1766-1813). Both men delighted in the experience of bird life as they explored God's creation, and marveled at the beauty, economy, and wisdom of their habits. Although Wilson recognized the importance of procuring specimens for study, he abhorred the over-collecting of birds and their senseless destruction. These sentiments were also part of John James Audubon's monumental, ornithological efforts culminating in the foundational volume, "Birds of America."



The American Society for the Prevention of Cruelty to Animals in the United States, and the Royal Society for the Prevention of Cruelty to Animals in England, both included birds as animals in need of protection. The destruction of birds and other wildlife, such as the bison, caught the attention of the industrialist, George Bird Grinnell, who grew up on the Audubon estate in New York, and who later founded the Audubon Society. Through his magazine, *Forest and Stream*, and the Boone and Crockett Club, co-founded with Theodore Roosevelt, Grinnell was able to help change society's attitudes, and to

push federal legislation for the protection of migratory birds. In 1885, Forest and Stream magazine published an essay predicting the destruction of bird populations due to the vast increase in plume hunting.

Numerous accounts by scientists concerning the cruel destruction of bird colonies, began to appear in popular magazines, which also published cartoons lampooning feathers in ladies' fashion. People lobbied their politicians. Local societies and junior societies were formed to instruct the youth to appreciate nature. Eventually, a series of laws were enacted on both sides of the Atlantic to halt the destruction.

Some positive outcomes included the establishment of a series of bird preserves.

By the 1920's, women's fashion of the late 1800's seemed bizarre. Society eventually recognized both the cruelty and population vulnerability involved in killing birds for fashion. May we remember this lesson, and harken back to the sentiments of early-day naturalists who recognized the wonder and glory of nature, and acted accordingly.

## **Article Review: Mammalian Cells Use Sun's Energy Via Incorporated Algal Chloroplasts**

by Hank Guarisco, editor

The source of energy used by most life on earth comes from the sun. Sunlight is processed by photosynthesis in chloroplasts found in plant cells to produce energy. Wouldn't it be great if animals could use this process? Well, some unicellular organisms, such as *Euglena*, actually do have chloroplasts and obtain much of their energy by photosynthesis. Other organisms have formed symbiotic associations with algae for the same reason. What if mammals, such as ourselves, could stand in the sun instead of going to McDonald's for lunch?

Japanese researchers have taken the first steps toward this goal by incorporating chloroplasts, from a primitive red alga, *Cyanidioschyzon merolae*, into a standard cell culture derived from a female Chinese hamster (*Cricetulus griseus*). The chloroplasts retained their structure in intracellular vesicles and were surrounded by mitochondria near the nucleus. They were able to maintain electron transport activity, photosynthesize, for at least two days after they were transplanted. Although this may seem like a rather limited result, a journey of a thousand miles begins with the first step.

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## Book Review: The Evolution of Beauty by Richard Prum 2017

by Hank Guarisco, editor

I was fortunate to recently acquire a book at the library book sale that will be a permanent addition to my library. The subtitle encapsulates the subject: “How Darwin’s Forgotten Theory of Mate Choice Shapes the Animal World – and Us.” We are all probably familiar with Darwin’s pivotal, 1859 book entitled: “On the Origin of Species,” which explains the origin of species by natural selection. However, a lesser known book, published by Darwin in 1871 – “The Descent of Man, and Selection in Relation to Sex,” explains another mechanism responsible for the great biodiversity we see around us today.



The colorful plumage of birds and the scales of jumping spiders have evolved in response to mate choice. Females evaluate different prospective mates, so that only those males possessing desirable traits will be able to mate and pass on their genes to the next generation. “The cumulative effect of many individual decisions shapes the evolution of ornament. In other words, members of these species act as agents in their own evolution.” Two beautiful examples are the male Cock-of-the-Rock (*Rupicola rupicola*) and the drab female and colorful males of the Blue Manakin (*Chiroxiphia caudata*). Even feathered dinosaurs, such as the late Jurassic *Anchiornis huxleyi*, sported colorful feathers. The actual plumage coloration was obtained by analyzing melanin pigment granules in fossilized feathers under an electron microscope!

Therefore, there are two evolutionary forces at work: natural selection and mate selection. Neo-Darwinists claim that mate selection is just another form of natural selection because they believe that females choose the best males, in terms of overall fitness, through evaluation of their ornamentation and various elaborate postures and dances. According to Darwin and Richard Prum, this is not always the case. The co-evolution of female preferences and male secondary sexual characteristics, has led to some truly amazing ornamentation that probably is not adaptive, and therefore counter to the forces of natural selection. For example, bright coloration may make some males more visible to predators. However, those that survive, get to pass on their genes, while duller colored males don’t mate, and therefore, their genes will be eliminated from the population over time.



The author takes us on excursions into the wonderful lives of tropical birds, and recounts his discovery of their unique courtship behaviors, and how they can be informative in the discovery of their phylogenetic relationships. The unique courtship of ducks is also discussed at length. I must confess that I have only glanced at the second half of the book, which involves an extensive discussion of primate sexuality, including human, in terms of the evolutionary theories presented above.

In addition to being well-written, “The Evolution of Beauty” is a great exposition on the evolutionary mechanism of sexual selection and the wonderful biodiversity of our living world.





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Come meet this year's keynote speaker:

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