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**SUMMARY REPORT**

**CSGA Meeting for Learning**

**Thursday, March 22, 2016, 7 – 9 pm**

**Annapolis Friends Meetinghouse**

**351 Dubois Rd. Annapolis, MD**

**Speaker: Bert Drake, Plant Physiologist and Scientist Emeritus, Smithsonian Environmental Research Center, Edgewater, MD**

**Subject: “The Effect of Increased Atmospheric and Terrestrial CO2 on Plant Physiology”**

**Synopsis of meeting: Drake presented a summary of over thirty years of scientific research into the effects of increased temperature and CO2 levels on the present and future of global plant systems and, by direct extrapolation, agriculture. The situation now is approaching grim and the prognosis is not good.**

**A More Complete Discussion of the Meeting:**

This evening we enjoyed a very informative and compelling presentation by Dr. Bert Drake of the Smithsonian Environmental Research Center. Attended by an audience of over twenty persons aged eight to eighty, this lecture was the latest in a continuing monthly CSGA Speakers Series hosted jointly by the Climate Stewards of Greater Annapolis and the Maryland Climate Coalition. Just before introducing Dr. Drake, J.T. Stokes of the Maryland Climate Coalition began the meeting with kudos for the Maryland governor and legislature for recent legislative actions. One, the Greenhouse Gas Reduction Act, renews the 2009 Maryland law that sets a goal to reduce climate-polluting greenhouse gas emissions statewide by 25 percent by 2020 and extends the goal to 40% by 2030. This bill has been signed into law by Maryland Governor Hogan. On a second related front, the Maryland General Assembly passed the Clean Energy Jobs Act during the this legislative session and if signed into law by Governor Hogan, will increase Maryland's clean energy standard to 25% by 2020, creating thousands of family-supporting jobs.

Ms. Stokes then gave an introduction of Dr. Stokes reminding all that Dr. Drake’s work, begun in the mid-80s is “the longest running field experiment in the world on the effects of CO2 on plant communities”.

Dr. Drake initially tantalized and maybe even teased this audience with early observations by his team that increased levels of CO2 have a beneficial impact on plant health and growth by initially causing elevated growth rates and health of plants due to the enhancement of photosynthetic responses. This is an observation that, by itself, has been seized upon by climate change deniers in arguing against the negative aspects of increased CO2 levels.

However, Dr. Drake and his team have been observing long term effects, not only of the effect of increased CO2 levels, but moreover the combined effect of temperature rise in the environment along with the CO2 increase. These later results have revealed that while initially elevated CO2 levels have a noticeable somewhat positive effect on growth, the later and more contemporaneous effects, including elevated ambient temperatures, reveal a lessening of the ability of these plants to store nitrogen, a process key to plant manufacture and storage of protein. So while the initial results may have appeared somewhat beneficial, the later results bring into serious question the ability of plants to sustain levels of protein production that will be essential as the world community seeks ways to feed vastly greater numbers of persons on the planet. Furthermore, as temperature increases, increasing areas of the planet being relied upon for agricultural production will fall victim to drought conditions that will further seriously jeopardize sustainability.

Although his presentation was at a level that was sometimes challenging for the audience to fully grasp, he was nevertheless stopped frequently by the engaged audience to seek a better understanding of the more challenging concepts. Dr. Drake willingly and expertly explained these concepts further, and the audience gave him a sincere round of applause when he ended. Many asked how they might better pass on his conclusions and observations to the large and vocal community of climate change skeptics who can sometimes dominate a reasoned discussion of scientific truth. All agreed that education and scientific literacy is key.

Dr. Drake urged the audience to become more acquainted with the scope and severity of this issue and read a recent book by Joel K. Bourne entitled The End of Plenty: The Race to Feed a Crowded World. By accounts, “part history, part reportage and advocacy, [it] is a panoramic account of the future of food, and a clarion call for anyone concerned about our planet and its people.”

Many online resources are available to further illuminate and report on Dr. Drake’s lifetime of work. One such may be found here: http://serc.si.edu/labs/co2/index.aspx and that can easily lead to many others.