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Phi Beta Kappa Visiting Scholar Topics, 2020-2021

For the General Public:

**The Stone Age didn't end because we ran out of rocks, the case for bioenergy?**

Finding sustainable, carbon neutral sources of energy is the defining challenge of our time! By the year 2050 there will be 9 billion people on earth. We are in the beginning of a sustainable revolution: more people, less time, higher risk, higher stakes/greater importance. The solution will be scientific, economic and political – on a global scale. A lot of chemistry, collectively called “photosynthesis” allows plants to use energy from the sun and convert CO<sub>2</sub> (a gas) from the atmosphere to carbon in the form of carbohydrates that make up the plants themselves. Plant “biomass” is a sustainable, renewal resource and its use as a substrate for energy production will reduce our dependence on foreign oil, reduce the use of petroleum for transportation and lower energy costs. Biomass may be generated anywhere in the world to provide a source of energy to emerging industrial countries. BUT In the US, corn is the current feedstock for use in making biofuels. Growing corn is expensive and because as a food crop using it for fuel competes with its use as a food. The use of food crops (grains and oil seeds) for fuel has raised the price of both. Global food costs have increased more than 1% as a result of increased corn prices alone and as we use more corn for fuel that number will increase. Land Use (Food vs Fuel) is the primary Political-Social challenge preventing the establishment of a cellulosic biofuels industry. There are many unresolved technical challenges to converting other types of plants/grasses (lignocellulosic biomass) to biofuels making their use currently uneconomical. In addition, current land use will not accommodate the need for generating sufficient biomass to have an impact on replacing petroleum. In the near term, “Food Security” will become a matter of National Security. Expanding managed lands to produce food or fuel will have a modest increase in food production but will have a dramatic effect on the release of carbon, loss of wild places, habitats and biodiversity. The benefits and challenges of developing biofuels have “fueled” a serious debate and both will be discussed.

**The only woman in the room: musings of a 60s feminist.**

As a young scientist I was often the only woman in the room for review panels, committee meetings, faculty meetings and scientific meetings. It took years for me to realize that when I was in that situation I should ask why and even longer for me to

learn how to be effective in insisting on change. Women are still in a minority of senior positions even though the pipeline is clearly not the problem. The discrimination is more subtle and more difficult to identify and speak against. As a senior scientist, President of an International Scientific Society and Professor I have learned how to recognize active discrimination and insist on change effectively.

*Classroom sessions/and or informal workshops:*

I could give modified versions of either of the two general public presentations.

With respect to bioenergy I could give presentations from a general discussion of biofuels to a detailed description of the genetics of non-model microbes that produce fuels and materials.

I could speak to special challenges faced by female academic scientists and ways to insist on change effectively.

A/V needs: For both talks, I will use power point. I will bring my own computer and connectors. I will need a projector and a screen or wall to project the slides to.