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Teller (1997)

In Teller's 1997 paper, "Global Warming and Ice Ages," he outlines several possible solutions for global climate change, either for warming or cooling climates. He makes the case that some of these solutions are true are not completely far fetched and may even be practical in that their costs could stay relatively low, though some ideas have physical feasibility problems based on the deployment and upkeep of these geoengineering projects.

Teller even goes as far to say that it would cost a greater sum to the entire world to reduce power consumption and restrict greenhouse gas emissions. The economic cost to the world for placing restrictions would be on the order of $\$10^{11}$ per year while one the solutions suggested in the paper would be considerably less, just under \$1 billion dollars a year.

All methods suggested in the paper involve the scattering of incoming shortwave radiation. Each solution method composes of the use of dielectrics, conductors, and resonant scattering materials. In addition, each method had to take in account the location of deployment. The geoengineering systems could be deployed, for the lowest cost, in the Earth's stratosphere, low orbit around Earth, or further away from Earth (Teller mentions around 100 mi from Earth).

One specific stratospheric deployed solution that Teller mentions is to use sub-microscopic oxide particulates. This method involves the use of sulfur oxides or alumina to scatter light. The earth is naturally cooled by volcanic outgassing of sulfur oxides, using more could scatter more light. Using alumina would have less negative environmental effects.

He also mentions the possible use of conducting sheets. These sheets would absorb some of the incoming shortwave radiation and would be placed in low orbit around the Earth. The absorbed radiation would be reemitted by the sheets, where half that radiation would be emitted into space.

Another solution would involve the use of quasi-resonant particles placed in the stratosphere. Although this would use less material than some of the other methods, one must take into considerable the chemical stability of these particles in the upper atmosphere.

Lastly, he mentions the use of latitude dependent scatterers. There would be long wave and short waves scatterers placed at different latitudes such that seasonal temperatures can be maintained.