

Lecture 28

Climate change due to volcanoes and solar cycle variations

Aerosol terminology

Aerosol = airborne solid or liquid particle with a typical size range of 0.01-10 microns

Aerosols have two effects on climate:

Direct effect = absorption or scattering of radiation

Indirect effect = acting as cloud condensation nuclei
or modifying the transmission of light through clouds
or changing the lifetime of clouds

Mechanism of Volcanic Perturbation

- particles in stratosphere increase Earth's albedo
- negative climate forcing (cooling)

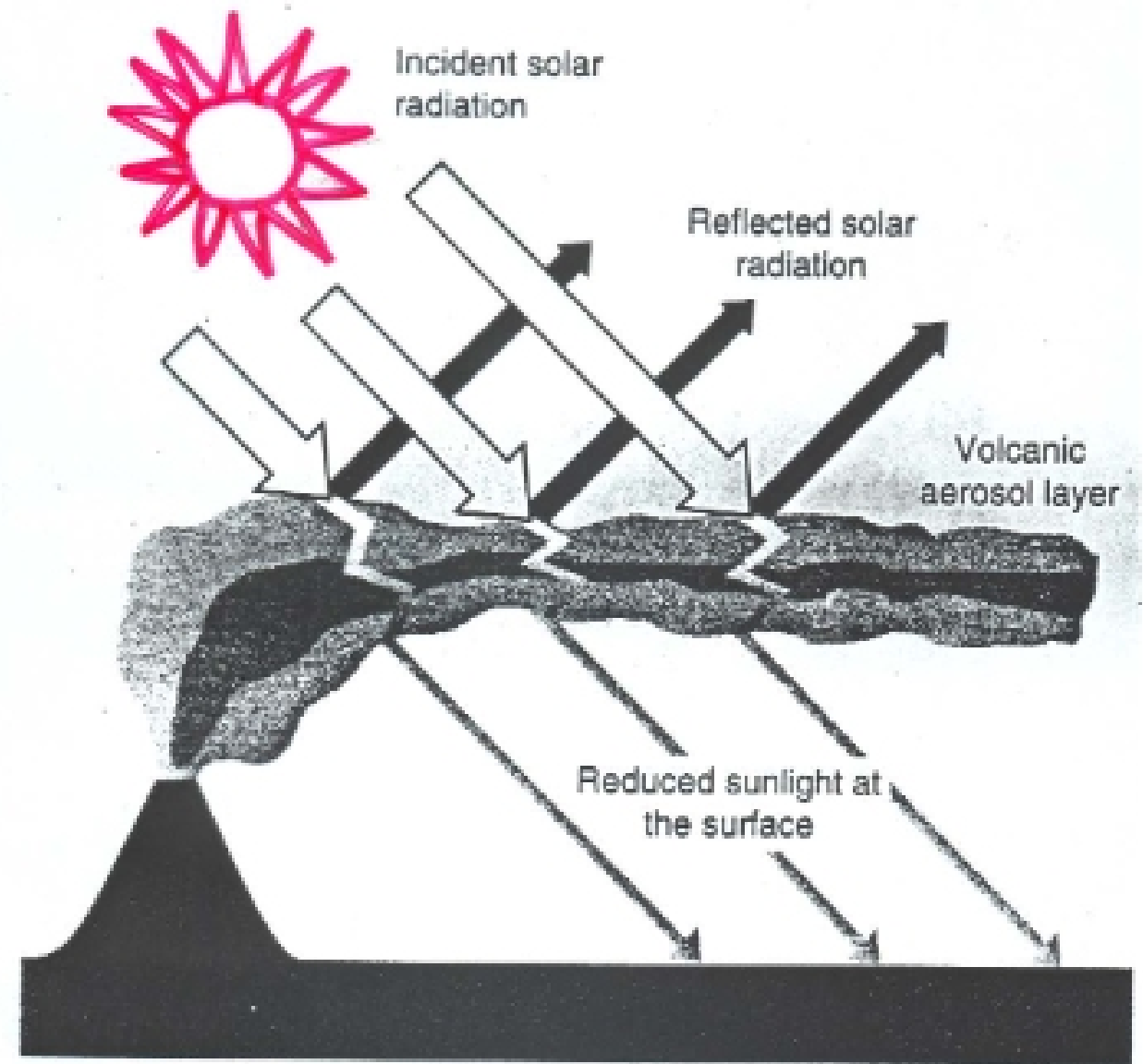


Figure 11.17 The effect of volcanic eruptions on the radiation balance and climate. The layer of particles generated in the stratosphere by a large eruption is seen to reflect sunlight, increase the Earth's albedo, and reduce the heating of the surface.