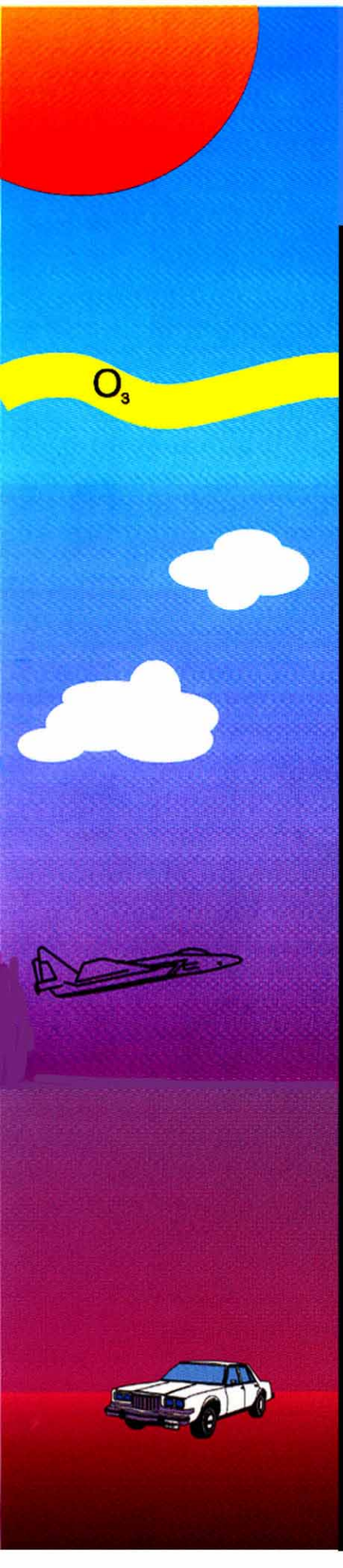
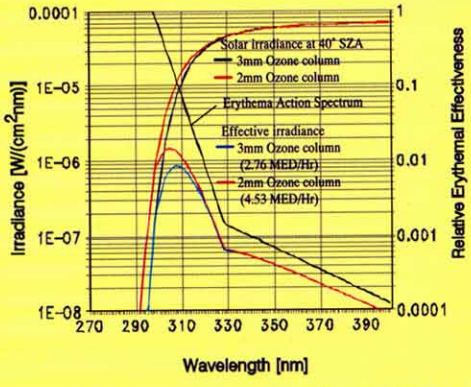
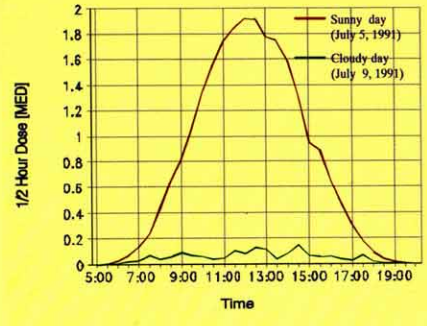
Before UV gets to the Earth's Surface....





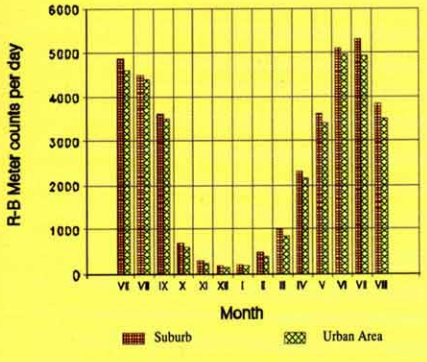
1) Erythema Action Spectrum after McKinlay and Diffey, 1987
2) Solar UV radiation model by Green, 1979

The UV radiation is absorbed and scattered by atmospheric gases and particulates. Ozone absorbtion plays the major role in the region of 200-320 nm. The biological effectiveness for some important processes increases rapidly towards shorter wavelengths amplifying the effect of ozone layer changes.



1) Measurements performed at Solar Light Co. in Philadelphia

As much as 95% of the UV radiation can be absorbed by cloud cover. Their variety of forms and variability makes it difficult to model the UV transmission through clouds. Clouds absorb and scatter UV changing the distribution from different directions.



1) After K.Slomka, Publ. Inst. Geophys. Pol. Acad. Sc, 1978
(cloudless periods selected, 1MED equals approx.440 counts)

Air pollutants produced by human activities and natural processes also affect UV reaching the ground. Measurements show significant differences in UV exposure between urban and rural areas, for example.

The individual atmospheric gases in the stratosphere and in the troposphere which affect the radiative transfer of ultraviolet are reactive with other gases, particulates and with radiant energy. Consequently, the distributions and concentrations of the gases are continuously varying. Modelling the UV radiative transfer to determine UV at the Earth's surface assumes a known atmosphere which can only approximate reality. UV measurements on the surface are not only essential for knowing that radiation but can help improve modelling paradigms.