Possible regions of partly ionized matter accelerated by electromagnetic forces are (i) shells of supernovae, in which the accelerating force may be the magnetic field of a rotating magnetized neutron star, and (ii) the HII regions around rotating magnetic Ap stars. I have considered this process elsewhere (unpublished work) and found that the energy input in this case may be somewhat in excess of 10^{-27} erg cm^{-3} s^{-1}.

I thank Dr E. P. J. van den Heuvel for comments.

OVE HAVNES*

Astronomical Institute,
Servaas Bolwerk 13,
Utrecht

Received November 30, 1970.

*On leave from the Institute of Theoretical Astrophysics, Oslo, Norway.

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Large Decrease in the Clear Air Transmission of the Atmosphere 1.7 km above Los Angeles

ASTRONOMICAL measures of atmospheric extinction, routinely carried out during most programmes of astronomical photoelectric photometry, provide a large sample of data of importance to studies of long term anthropogenic pollution of the atmosphere[1]. We have therefore begun an exhaustive compilation of present and past measures of extinction at as many observatories throughout the world as possible. I wish to point out one of the most important results so far, the measurement of a large secular decrease in the transmission of the atmosphere measured at a significant altitude above the Los Angeles Basin.

In 1911, Abbott[2] published the results of his measures of the transmission at various wavelengths of the atmosphere above Mount Wilson, California, which is on the rim of the Los Angeles Basin, 1,742 m above and 11 km horizontally from the centre of Pasadena, and 25 km from downtown Los Angeles. Fig. 1 shows a plot of his data for four wavelengths, in the ultraviolet, blue, yellow and red, given in units of atmospheric extinction by magnitudes, as conventionally determined by astronomers[3].

In the years just before the advent of frequent occurrences of smog at these altitudes, which became important beginning in about 1962, I measured the atmospheric extinction in three wavelengths on 31 clear, smogless nights at the Mount Wilson Observatory. Measures were made in the standard way with photoelectric photometers attached to the 60 inch and 100 inch telescopes. The mean extinction coefficients are also plotted in Fig. 1, where they are compared with Abbott's values found just over 50 yr previously.

The differences in the extinction coefficients are striking: 0.27 mag. in the ultraviolet, 0.09 mag. in the blue and 0.10 mag. in the yellow. These are large differences, especially considering that the data for the 1960s were taken only on nights when

Table 1 Decreases in Atmospheric Transmission at Mount Wilson

Wavelength (μm)	50 yr decrease (%)
0.35	26
0.44	9
0.55	8

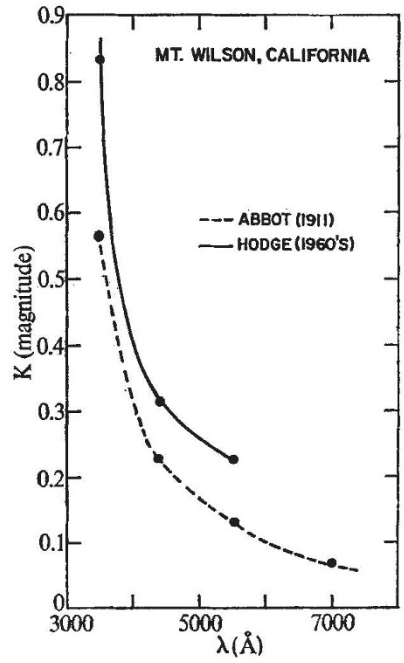

Fig. 1 A comparison of clear air extinction coefficients (in astronomical magnitudes) for the Mount Wilson Observatory for a period before 1911 and for nights in the years 1960–1962.

no trace of smog was detectable by tests for transmission variability. The fact that the early data are for daytime and the latter data are for night-time cannot conceivably account for this difference.

Table 1 gives the percentage decrease in the transparency that is indicated by these figures. It shows that the apparent secular change in the clear air transparency for this site, far above the Los Angeles Basin, is as large as 26% in the ultraviolet during this crucial period. This is clearly an important example of how astronomical current and archival data of this sort can be useful in studies of atmospheric aerosol pollution, which have taken on a recent urgency because of speculation on the possible effects on world climate[4–6].

PAUL W. HODGE

Department of Astronomy,
University of Washington,
Seattle,
Washington 98105

Received September 28, 1970.

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Shear Wave Propagation in Rocks

WE have demonstrated striking similarities in elastic wave propagation through rocks and single crystals in recent experiments. In particular, we find that two shear waves with displacements perpendicular to one another and with differing velocities are often propagated through rocks. This is illustrated in Fig. 1 at 5 kb pressure for samples of slate and dunite; an ultrasonic technique described by Birch[1] was used. One MHz AC-cut quartz transducer generated and received the shear waves, and an electrical pulse of 50 V was used to excite