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APPEARANCE OF HAZE AND CLOUDS THROUGH A POLAROID

It is well known that the use of a red filter in cloud photography results in increased contrast between the cloud and the sky back-ground because of the suppression of light of shorter wavelengths which predominate in the sky light. A similar but somewhat different and far more spectacular phenomenon is observed when haze and clouds in the distance are viewed through a polaroid. The "visibility" of the haze layer and clouds undergoes remarkable variations as the polaroid is rotated. The variations are most pronounced in a direction which is 90° away from the sun because of the high degree of polarisation of sky light from such a direction. As the polaroid is rotated the cloud and the haze layer stand out brilliantly against a comparatively dark back-ground for a certain orientation of the polaroid. As the polaroid is rotated from this orientation, the sky brightness progressively increases. At the same time the "visibility" of the haze layer and the clouds against the sky back-ground deteriorates. When the polaroid has been turned through 90° from the previous orientation a very different picture is noticed. The sky brightness is now a maximum; the haze layer appears dark and at times the clouds above the haze layer also look dark, particularly the wisps of fair weather cumulus clouds which appear to be floating on the top of the haze ocean in the winter afternoons.

Figs. 1 (a), (b) and 2(a), (b) illustrate the changes described above. These are photographs taken by the author with a Rolleicord camera from the Kodaikanal Observatory (7688 ft a.s.l.) by interposing a polaroid in front of the camera lens. Figs. 1(a) and (b) show the changes in visibility of the haze layer and some cirrus clouds in the direction of Perumal peak (NE) for the two different orientations of the polaroid. Figs. 2(a) and (b) are similar photographs taken in the direction of Kambam valley (SE). The

ocean of haze enveloping the plains is clearly seen in these photographs. A distant chain of hills can be seen dimly through the haze in the second pair of photographs.

The changes observed when the polaroid is rotated arise because of the differences in the nature of the light from the cloud, the haze layer and the sky back-ground as regards the state of polarisation. In the winter months the haze over the plains does not extend to the height of the Kodaikanal Observatory and appears as a vast ocean stretching upto the horizon when seen from the observatory (Ananthakrishnan and Sankar Narayan 1951). The sky above the haze layer is remarkably blue and because of the high degree of polarisation of the transversely scattered light the sky back-ground undergoes large variations in intensity when the polaroid is rotated while the light from the cloud and haze undergoes little variation in intensity. The relative variation in intensity between the object and the back-ground gives rise to the observed effect. A somewhat similar phenomenon resulting from change in the back-ground intensity is well known in the case of solar prominences which appear bright against the sky back-ground when they are at the limb of the sun and dark against the brilliant solar disc (*vide* Figs. 3(a), (b) and (c)).

In the course of observations it was noticed on several occasions that when the haze layer was not normally visible in some directions because of the lack of contrast between it and the back-ground, the use of a polaroid filter oriented suitably brought it out conspicuously.

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REFERENCE

- Ananthakrishnan, R. and 1951 *Indian J. Met. Geo-phys.*, 2, 4, p. 265.
Sankar Narayan, P. V.



(a)

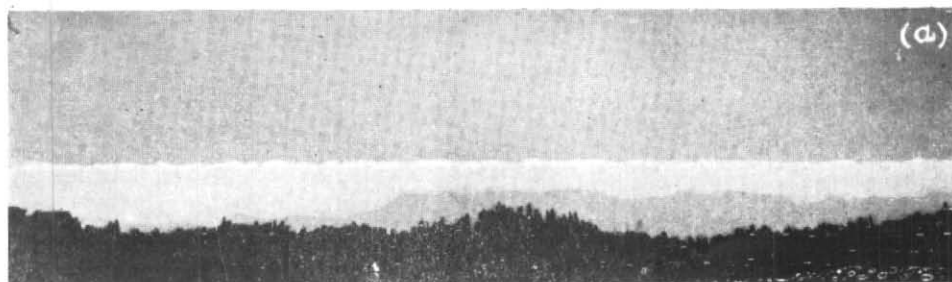


(b)

(a) 19-1-1950, 10h 35m

(b) 19-1-1950, 10h 37m

Fig. 1



(a)



(b)

(a) 20-1-1950, 14h 20m

(b) 20-1-1950, 14h 21m

Fig. 2



Fig. 3(a). 1-11-1951



Fig. 3(b). 2-11-1951

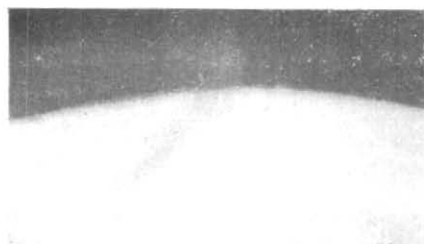


Fig. 3(c). 3-11-1951