Reply

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My note (Boudreau, 1970) examined only one part of the complicated problem of selecting the optimum laser wavelength for use in meteorological lidar which utilizes Raman scattering, that part being the offsetting effect of increased attenuation by molecular Rayleigh scattering when using the ultraviolet laser in preference to the ruby laser to enchance Raman scattering. The effect of molecular attenuation was treated because Leonard (1967) had neglected it and because it was amenable to solution, reasons which apparently should have been stated more emphatically in the note. As Cooney, Cohen and Clemesha have indicated, the attenuation of the laser energy by the dispersed phase of the atmospheric aerosol must also be taken into account. It is

difficult, however, to treat the general case since the dispersoid's size distribution is, in general, an unknown function of space and time. Hence, only special cases can be analyzed, such as the homogeneous, mono-sized non-absorbing, spherical dispersoid which Cohen has treated. Also, at the time of my study I was primarily concerned with quasi-horizontal sampling of the atmosphere near the earth's surface, and therefore did not consider variations in air density along the path of the lidar pulse. Therefore, Clemesha is correct in observing that my derived formulas are invalid for use with lidar which obtain vertical soundings of the atmosphere. It is gratifying to see these contributions by Cooney, Cohen and Clemesha to our understanding of the problems associated with lidar probing of the atmosphere.

REFERENCES

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