



OZONE ABSORPTION OF ULTRAVIOLET RADIATION IN
THE UPPER ATMOSPHERE

by

J.R. Catchpole, B.Sc.

A Thesis
Presented for the Degree of
Master of Science
in the
University of Adelaide.
April, 1964

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SUMMARY

This thesis outlines the preparation for an experiment to measure the vertical distribution of ozone in the upper atmosphere. The equipment built has been flown in a rocket to determine the intensity of certain solar ultraviolet radiation as a function of altitude. This determination was made at a wavelength within the region in which ozone absorption is considerable and in which that by any other atmospheric constituent is negligible. The ultraviolet attenuation is thus a measure of ozone distribution.

In Part A, a survey is made of atmospheric ozone and of the part it plays in the physics and photochemistry of the atmosphere. Variations in observed ozone content and distribution have important relations with the dynamics of the atmosphere and with several meteorological parameters. Established and suggested correlations with other geophysical phenomena are also noted. The review includes reference to the various methods of ozone measurement which have previously been used.

Part B gives some details of the preparations for the experiment. The method of measurement is explained and the several experimental units which have been built are described. Consideration is given to various factors relating to the expected response from the flight equipment, and there are some notes on the first rocket installation.

More detailed measurements of the characteristics of the different components of the units are given in part C. In particular, these include filter, phosphor and photocell measurements. The variations in filter transmission with angle of incident radiation, and temperature effects on filter and photocell are especially relevant to the experiment. A brief note on theoretical dissociation rates for molecular oxygen and ozone follows in part D; and part E includes some comments on the record obtained from the units flown in the first rocket experiment.

This thesis contains no material which has been accepted for the award of any other degree. Except where due reference is made in the text, it includes no material known to have been previously published or written by another person.

31/3/1964.