

**Remarks on "Line absorption and radiative equilibrium"**

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In the recent paper by Dr. King<sup>1</sup>, the following statements are made:

*Page 319:* For all equilibrium lapse rates the temperature decreases monotonically upwards and approaches zero at the top of the atmosphere. It is therefore impossible to account for the isothermality of the stratosphere, and *a fortiori* for the temperature increase with height, on the basis of any long-wave equilibrium model. This conclusion, reached on the basis of a line-absorbing model, holds quite generally;

*Page 320:* Between the tropopause and a level of approximately 6 km lies the radiatively-controlled upper atmosphere, the only region in the atmosphere in infra-red radiative equilibrium.

There is always danger that such categorial statements may be accepted at their face value, without full appreciation of the underlying assumptions on which the work is based. In this case, one of the assumptions made is that the quantity of absorbing material changes regularly with height in the atmosphere. This assumption is certainly very far from correct; ozone, which has a strong absorption band in the infra-red region, increases greatly with height from 10 to 20 km, and may well be the cause of the increase of temperature with height actually found at these levels. The statements quoted above, therefore, do not apply to the actual atmosphere.

<sup>1</sup>J. I. King, "Line absorption and radiative equilibrium," *J. Meteor.*, 9, 311-321, 1952.