Int. J. Heat Mass Transfer. Vol. 15, p. 1289. Pergamon Press 1972. Printed in Great Britain

LETTER TO THE EDITORS

COMMENT ON "LIMIT OF PURE CONDUCTION FOR UNSTEADY FREE CONVECTION ON A VERTICAL PLATE"

(*Received* 18 *October* 1971)

PERHAPS it is worthwhile to interpret Nanbu's results [1] in terms of the Prandtl number, particularly from the viewpoint of its extreme values.

(i) As $Pr \to 0$, $F(\eta) \sim 0(1)$ [see his equations (16)]. Consequently, $T^*_{crit} = (2/F_{max})^{\frac{1}{2}} \sim 0(1)$, and $Nu_x/Gr_x^{\frac{1}{4}} = (Pr/\pi)^{\frac{1}{4}}$ $(T^*_{crit})^{-\frac{1}{4}} \sim Pr^{\frac{1}{4}}$. This result has been shown to be true for the steady state, by Kuiken [2], with the help of a double-boundary-layer technique.

(ii) As $Pr \to \infty$, $F(\eta) \sim 1/Pr$. Consequently, $T^*_{crit} \sim Pr^{\frac{1}{2}}$, and $Nu_x/Gr_x^{\frac{1}{4}} \sim Pr^{\frac{1}{4}}$. The last result is fairly well known.

REFERENCES

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2. H. K. KUIKEN, Free convection at low Prandtl numbers, *J. Fluid Mech.* **37**, 785–798 (1969).

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