The general stability of the basic equations has been studied (Appendix II, Ref 11) and is 'very satisfactory'. The coupling effects (a) and (b) have been demonstrated always to converge by means of the semi-iterative check. The accuracy has been checked (Collins[16]) by many comparisons with analysis and experiment.

Here, therefore, only coupling (c) is considered, as the current solutions of the U, V, P equations never displayed instability. Further, it is the coupling and not the basic treatment which causes the problem. This is because the comparison with data of Brinkman[4], and Ou and Cheng[5] is satisfactory for a fixed velocity field and constant μ. In this work the instability only arises for a flat velocity profile, and not for the μ variation itself. This is conclusively confirmed by the comparison in Ref 3 with experimental data of Polak, and Hersey and Zimmer, and the analysis of Martin[17] for unheated high viscous dissipation flows. There the same problem arose near entry to a duct where the velocity profile was again flattened. For the rest of the flow, where of course μ and the velocity field were varying, no such problem arose. The overall comparison favoured the current treatment.

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20–22 September 1983, Budapest

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