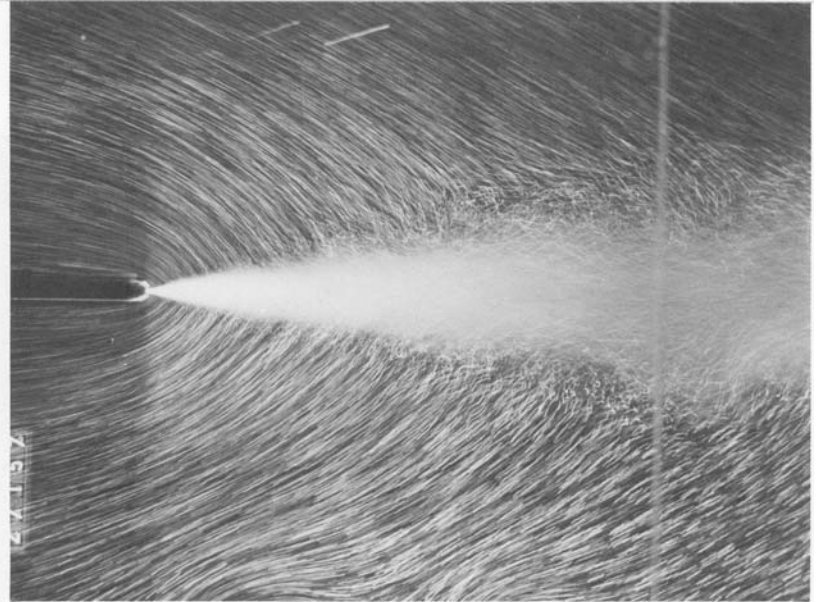


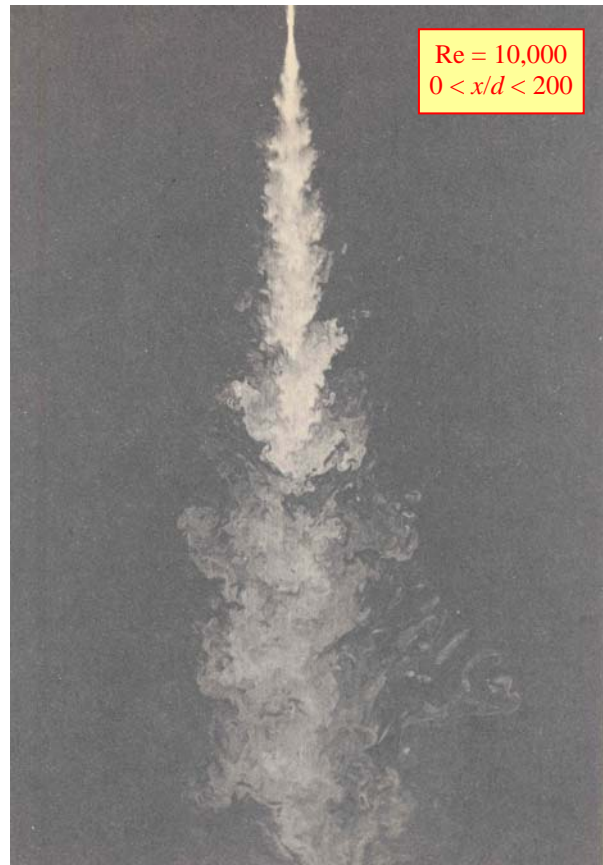
1. Two dimensional (plane) turbulent jet

169. Entrainment by a plane turbulent jet. A time exposure shows the mean flow of a plane jet of colored water issuing into ambient water at 100 cm/s. Tiny air bubbles mark the streamlines of the slow motion induced in the surrounding water. ONERA photograph, Werlé 1974

From: Van Dyke, M., *An Album of Fluid Motion*, Stanford, CA, The Parabolic Press, 1982, p. 99.



2. Axisymmetric (round) turbulent jet



From: Dimotakis, P. E., Miake-Lye, R. C., and Papantoniou, D. A., Structure and Dynamics of Round Turbulent Jets, *Physics of Fluids*, Volume 26, No. 11, November 1983.



From: Mungal, M. G. and Hollingsworth, D. K., Organized Motion in a Very High Reynolds Number Jet, *Physics of Fluids A*, Volume 1, No. 10, October 1989.

The above two pictures are of a TITAN IV rocket motor test. The thrust is 1.6×10^6 lbf, the jet exit diameter is 10 ft, and the Reynolds number is about 1.8×10^8 . The rocket test stand is approximately 100 ft. high. The bright portion of the plume is about 400 ft high. The overall height of the plume in the left picture is about 600 ft, corresponding to $0 < x/d < 60$. The overall height of the plume in the right picture is about 5000 ft, corresponding to $0 < x/d < 500$.