

CHAPTER I



INTRODUCTION

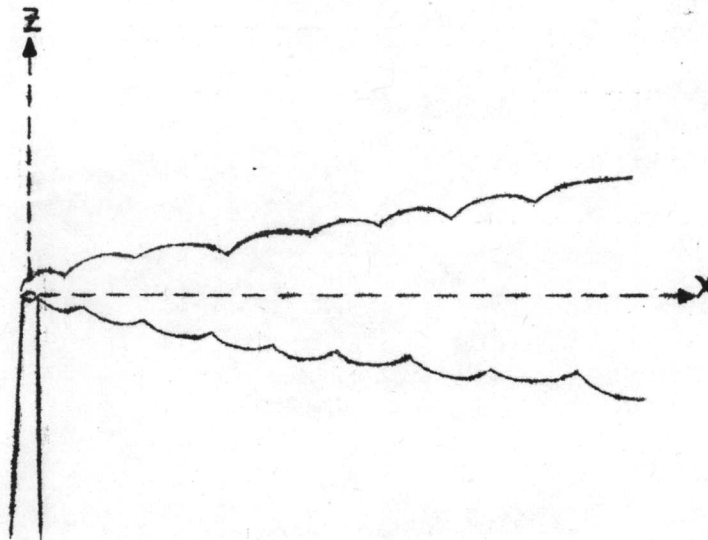


Figure 1.1

When smoke is emitted from a chimney it is blown downwind forming a plume as sketched in figure 1.1. Atmospheric turbulence causes the smoke to spread out more and more as the distance from the chimney increases.

A proper study of the theory of plume formation must be done in three dimensions. However we shall replace the proper models of smoke in three dimensions by a model in two dimensions for simplicity. Therefore the model will be restricted to the vertical plane through the axis of the plume. Let x denote the distance downwind from the source, and let z denote the vertical displacement of the smoke particles.

In this thesis we shall study properties of simple mathematical models whose behavior is similar to that of smoke particles in the plume.