CHAPTER 4

SEDIMENT MOVEMENT BY FLUID FLOW

4.1 FUNDAMENTALS OF FLUID FLOW

Introduction

Before discussing the transport and sorting of sediment and the formation of sedimentary structures, some attention must be given to the part of the dynamic environment often neglected by the geologist—the fluid. The term *fluid* includes both liquids and gases. A fluid is a substance that is deformed by a shear force, no matter how small the force may be; that is, it is a substance that has no strength.

The forces that act on solid or fluid bodies are vectors that may be resolved into components normal to and parallel with the surface of the body. The components of force, per unit area, normal to the surface are called *pressure*; those parallel to the surface are called *shear stress*. It is convenient to distinguish certain *body forces* that act equally on every particle composing the body—for example, gravity or inertia. Gases, including air, respond to change in pressure by expansion or contraction; that is, they are compressible fluids and, at high speeds, the density cannot be treated as constant. Liquids are only slightly compressible, however, and for a given temperature the density may be considered to be constant.

Apart from the density, the other main property of fluids controlling the way