The methods used to fractionate soil organic matter can be placed into two categories: (1) those used to fractionate and estimate compounds characteristic of plant tissues, and (2) those based on the division of the humus proper into subclasses possessing similar solubility characteristics. The methods in the first category have been particularly useful in investigations dealing with organic soils and forest humus types, as well as for determining rates of decomposition in composts (Ashworth, 1942a, 1942b; Shewan, 1938; Waksman and Stevens, 1930). Methods in the second category are used primarily for investigations dealing with the chemistry of humus and its mode of formation.

The great difficulty in all fractionation procedures is that the methods employed either separate out products which are not definite chemical entities, or they form artifacts which do not have the properties of the original material. Nevertheless, the various fractionation procedures have proved useful for studying soil organic matter, and they will probably continue to be used in the future.

In this section, three fractionation procedures are described. The first concerns the proximate analysis for estimating waxes, resins, hemicellulose, cellulose, and "lignin-humus." The second describes the classical method for subdividing humus into the fractions referred to as humin, humic acid, fulvic acid, \( \beta \)-humus, and hymatomelanic acid. The third method gives a scheme for the subdivision of the fulvic acid fraction.

### 94-2 PROXIMATE ANALYSIS

#### 94-2.1 Introduction

This method applies to a single soil sample a series of treatments that are employed to dissolve specific classes of organic compounds from plant