I. INTRODUCTION

The question of the origin of animal cellulase—is it or is it not produced by the animals—has engaged many authors concerned with cellulose digestion in invertebrates. However, in most animals studied no definite conclusion has been reached. There is only one species, which is known to produce its own cellulase: Ctenolepisma lineata (LASKER & GIESE, 1956). Much confusion has arisen from the fact that it is seldom realised—especially in the older literature—that cellulose breakdown is a complex process, so that the choice of substrate as well as the choice of the degradation product studied are decisive for the outcome.

A full description of cellulose demands, in addition to a qualitative description as unbranched chains of 1,4 linked β-glucosyl units, also a quantitative description of the degree of polymerisation and of the degree of crystallinity, i.e., a description of the fraction of the cellulose ordered in a rigid lattice stabilised by H-bonds and van der Waals forces, is needed. It is on these two points that the description of cellulose, especially of the undegraded celluloses found in the natural diet of the animals studied, often remains vague. Many authors on cellulose digestion in Metazoa fail to distinguish between the activity of the digestive juices toward degraded or substituted celluloses and toward native cellulose.
A number of studies on the breakdown of cellulose by soil microorganisms (SIU, 1951; REESE, 1956; HALLIWELL, 1963, 1965; SELBY & MAITLAND, 1967) and by rumen microorganisms (HUNGATE, 1964) have made it clear, however, that without further evidence an equation of activities based on different types of cellulose is not warranted.

The "backbone" of the experiments described in this paper is the hypothesis of SIU (1951) on the mechanism of breakdown of cellulose by soluble mould cellulases. The essentials of this hypothesis and its subsequent elaboration have been summarised in Fig. 1, which was composed on the basis of several publications, e.g., those of SIU (1951) and COWLING (1963). It shows the subsequent steps of the degradation of native cellulose into glucose.

![Fig. 1. Diagram to illustrate the different steps in cellulose breakdown as found in mold cellulases. Turnover number from Biochemists Handbook, Degrees of polymerisation (D.P.) from Ott, 1954.](image)

The broadest recent review of the literature is found in the article by STONE & MORTON (1958) on the distribution of cellulases in Molluscs. It becomes evident from this review that literature on cellulolytic