INTRODUCTION.

1. Policy.

The object of any breeding policy must be to increase the profit per acre. This is dependent on costs of production, yield and selling price. It is not the work of the breeder to determine costs of production. He can, however, influence yield, and perhaps selling price if this is bound up with quality. That quality of maize affects the price in Trinidad is not definitely known. Jones (37) remarks that soft, starchy ears command a premium in Trinidad but brings forward no evidence of this. High oil or protein containing varieties can be bred, but in Trinidad at least, commands no premium. Wallace (65) points out that "we shall need experiments to discover whether or not it is desirable to have softer textured strains of corn in order to promote greater ease of mastication by hogs, or whether such problematic advantage in softness may be offset by lower yields and susceptibility to disease. Most farmers still look on corn as corn." Until nutrition experts or crop product specialists create a special demand, composition of corn would not appear to be a factor influencing selling price.

Quality may also be taken to mean uniformity, but uniformity per se is valueless. Where mechanisation of agricultural practices or of processing is common, or where an export trade exists, uniformity may command a premium and hence be valued as "quality". Mechanisation is not common in Trinidad and corn is actually imported. Maher and Prentice (46) and Purseglove enlarge upon the possibilities of exporting maize from Trinidad. Recently Jamaica has accepted a contract to export maize to New Zealand, and an effort is being made to persuade the peasants to grow more of this crop.

At present however, quality does not appear to command a differential price in Trinidad, and such being the case, the aim of the breeder is to improve yields.

2. Arrangement of the Work.

More is known about the genetics of maize than of any other plant. The breeding of better maize varieties decides the economic welfare of thousands of square miles, especially in the U.S.A. Yet the exact nature of vigour and yielding power are but imperfectly understood. The author is firmly convinced that an up-to-date knowledge of the theories of maize breeding and of vigour and yielding power are essential before any attempt can be made to breed new varieties. Consequently, this work is so arranged that a survey of these theories precedes any account of work done. In particular a considerable amount of space is devoted to "Heterosis". As no work was done on Heterosis this section is relegated to the Appendix, but the author recommends that it should be studied before the rest of the dissertation.

These introductory accounts are not "Literature Surveys". Purseglove (51) produced a fairly compact survey of the literature as have previous workers. The literature is voluminous and full of apparent contradictions. It is the object of these introductory accounts to explain general conclusions and the exceptions to them on the basis of modern knowledge. Only by such an approach can sound recommendations be made. Many of these recommendations are necessarily destructive, but to say "do not do this, it is harmful" is quite as useful as to say "do this, it is good."

An example of this is the conclusion, "between careful mass selection on the one hand and selection within selfed lines on the other, no method of corn breeding that has been

tried has offered enough advantage to warrant its recommendation" (53 p. 58). Accordingly only Mass Selection and Pure Line Production and Hybridisation are here considered.

Another example is that "close selection for any specific character leads to loss of yield" (53 p. 27). There is an exception to this rule viz: "that the production of two cobs is the only specific character selection for which does not lead to loss of yield" (53 p. 27). Accordingly an attempt is made to explain this exception in the terms of modern knowledge and an experiment was carried out to investigate the nature of "double" cobs and to examine the effect of selection thereof. As this is not yet an intrinsic part of the breeding programme, it also is relegated to an Appendix, along with similar experiments on other "specific" characters.

A third example of "destructive" conclusions is that "slight physical differences among good seed ears are of no value in indicating their relative productiveness." The exception here seems to be that long, few-rowed ears are better than short many-rowed ears. Again an attempt is made to explain this with the help of experiments, also relegated to the Appendix.

A fourth example is that"no characters of parent pure lines are indications of their progeny yields." (40) Exceptions to this general rule are examined and explained. Their explanation was found too late to seriously affect the current year's breeding policy so that this also is relegated to the Appendix; in actual fact to the discussion on Heterosis.

Thus the main body of the dissertation concerns the policy and practice adopted and the ideas and facts underlying such policy and practice. The Appendices contain such ideas, information and experiments as were not strictly a part of the breeding policy.