A BASIS FOR THE QUANTITATIVE STUDY OF THE
STRUCTURE OF BEHAVIOUR

by

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(Rec. 14-XI-1953)
(with 5 figs)

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INTRODUCTION

In the course of the great advances in ethology which have been made in the last quarter-century, a number of concepts have been thrown up. Some of these, such as the notion of a single key stimulus, have a purely qualitative reference. However, even before the development of methods of measurement, ethologists have found it intuitively possible, and methodologically extremely useful, to handle concepts pre-adapted, as it were, for quantitative study. It is hard to see how the existing body of theory could have been built up without these concepts. Thus the important concept of displacement activity was built on the notion of conflicting drives (Tinbergen, 1940), at a time when measurement had not yet proceeded beyond the distinction of very few stages of ‘intensity’. Yet ‘drive’, in every one of its many usages, appears as something that can vary quantitatively.

These quantitative concepts have been of two main kinds. First, there are those, such as the ‘intensity’ of a reaction, which relate to variations in overt behaviour which are in principle amenable to direct measurement. Second, there are concepts at various levels of abstraction from observed behaviour, such as drive, motivation and their German equivalents.

Now that more precise quantitative measurement of behaviour is becoming useful and possible, it is natural that these concepts should come under special scrutiny. And now we find that, despite the important and fruitful role they have played in building the qualitative picture, they have certain defects which can be traced to their origin. They have rarely been defined in precise and unequivocal terms, and as a result they have been used by different authors in a variety of different ways. The most cursory glance at the literature, the briefest of discussions with a number of different workers suffice to indicate the entanglement of misunderstandings in which the new quantitative study is enmeshed at the very outset of its career. The state of