

SYMPOSIUM ON FATIGUE WITH EMPHASIS ON STATISTICAL  
APPROACH—II

## INTRODUCTION

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Measurements made to determine the physical properties of materials usually exhibit more or less variation in the results obtained with different specimens. Sometimes this variation is small enough not to interfere with the interpretation of the data. Often the experimental results vary to such an extent that a considerable zone of uncertainty exists as to the value of the property under study. Then attention is directed to refinements in the measurement technique and to better sampling procedures. If the material is not homogeneous, this fact may be of prime importance.

It is common practice to resort to the use of averages to obtain values of the desired reliability. Averages conceal the variation which may be a determining factor in the use of the material. Turbine blades that vary greatly among themselves may actually be less useful than blades from some other material with a lower average strength if the

latter material is more uniform. Thus both the interpretation of data and the proper utilization of the material may require a careful study of the variation present in the experimental results.

All four papers in the present symposium have in their titles the word "statistical." It is the task of statistics to study variation, to devise appropriate measures of variation and, in general, to establish certain rules concerning the behavior of measurements. The titles of these papers indicate that the authors have given special attention to the variation associated with their material and to their measurements. In this respect these papers add their weight to a developing trend in experimental investigations. Only a small minority of published papers as yet give evidence that sound statistical procedures have been employed. The example set by the papers in this symposium should induce other workers to give adequate consideration to the statistical aspects of their data.

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