

# The British Coal Utilisation Research Association

MONTHLY BULLETIN

Vol. XXVI No. 9

SEPTEMBER, 1962

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## REVIEW No. 215

### RECENT ADVANCES IN MECHANICS OF COAL BREAKAGE

R. L. Brown

#### (1) Introduction

UNDERSTANDING of the mechanics of coal breakage is important for mining technology and coal pulverising and can be expected to help in appreciating better the size grades of coal that can be prepared economically for various uses. The literature is extensive and goes back many years (Brown & Hiorns, to be published). Much of it is abstracted in the D.S.I.R. bibliography on crushing and grinding (Bickle 1958) : and an important series of studies of the mechanical properties of coal has been issued (Walton 1958). Understanding has been further advanced in two papers (Gilvarry 1961, Gardner, Austin & Walker 1961) and it appears timely to review briefly the present position. The availability of the references already cited makes it unnecessary to attempt a complete survey of the literature. Instead, an effort is made here to pick out a few papers that appear to the writer to have particular importance.

It will be seen that theoretical and experimental work on the size distribution of broken coal are in good accord : although some information is now available on the effect, on the size distribution of the fragments, of the ways in which the stresses are applied, this is not yet sufficient to give a fully coherent picture.

In considering what is needed in the future, it has to be remembered that the experimental evidence provided by a sieve analysis is often subject to large sampling errors, with major uncertainties at the fine and coarse ends. Taking this experimental limitation in conjunction with the statistical character of the size distribution (and its consequent insensitivity as an indicator of the nature of the breakage process), it would seem likely that further advances in the