
THE WASHABILITY OF INDIAN COALS

by

C. FORRESTER & J. N. MAJUMDAR



UEL RESEARCH COMMITTEE
OARD OF SCIENTIFIC & INDUSTRIAL RESEARCH
REPORT No.

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NOTE — This report is a record of work forming part of a series of investigational schemes approved by the Fuel Research Committee of the Council of Scientific & Industrial Research (Chairman : Mr. A. Farquhar). The work is continuing (from October 1947) under the Director of the Fuel Research Institute.

Although the report is issued under the authority of Council, the opinions are those of the principal authors.

FOREWORD

THESE INVESTIGATIONS were sponsored by the Fuel Research Committee at the instance of Sir Shanti Swarup Bhatnagar, Director of Scientific & Industrial Research. Work of this nature has been done before in India, but not on the broad lines of enquiry which have guided the course of these investigations nor on the same co-ordinated scale. The report includes some of the earlier and private work of Dr. Forrester in addition to the work carried out on behalf of the Fuel Research Committee. The most important investigations previously carried out were those of Randall in 1924-25. These, however, were confined to narrow limits and done at a period when seams of coal inferior to what are now known as Selected Grades attracted little or no attention. The question was the beneficiation of the commercially good seams at that time which, although high in ash compared with normal English coal seams, would still be considered first-class coals in India today.

These early enquiries proved that the foreign material was too finely disseminated for beneficiation to be a commercial success. Through no fault of Randall and other early investigators, the industry too readily concluded that Indian coals in general were not amenable to coal beneficiation, and this unfortunately led to the discouragement of further research and probably retarded progress for two decades. Credit is due to those who did not concur in the popular conclusions of the industry and who consistently pursued their enquiries and have now established that Indian coals, although more difficult, are amenable to treatment and that it is only a question of selection of plant, comparative losses, and costs of beneficiation.

With the exhaustion of the better-grade seams and the increasing production from inferior ones (with bands of shale and clay and bony coal), the percentage of foreign material in the run-of-mine (r.o.m.) production has rapidly increased. This trend has been further accelerated by the abandonment of selective mining which has, very properly, been adopted in recent times. The problem has been further aggravated by the increasing reluctance of miners and loaders to produce clean coal. The quality of the r.o.m. production is also deteriorating as a natural consequence of increasing mechanization. However efficient or inefficient hand labour may be in producing and loading out coal, discrimination between good and bad is largely beyond the means of mechanized coal production. Consequently, in spite of the prejudices of the industry, based erroneously on earlier investigations, producers have been compelled to adopt coal beneficiation by the primitive and costly means of hand-picking and sorting. This has led to great waste without achieving the steady uniformity of grades and maximum recovery which can be readily obtained by coal washing. To indicate what can be done, attention is drawn to a washing balance sheet for a difficult coal, included as an Appendix to the report, and to the conclusions summarized in the final table. It will be seen that if coal has to be utilized in the best national interest, sale on specification must be made statutory, and the crude and obsolete methods of price-fixing introduced by the first Coal Commissioner must be abandoned.

Very low ash coal (at a cost) can be produced from inferior seams for special industrial processes when necessary, and from the same seams (of coking coal) metallurgical grade coal can be produced equivalent in quality to that of the better-grade seams now approaching exhaustion, *with the added advantage of uniformity*. It can be taken that by coal beneficiation moderate proportions of what were considered inferior Jharia seams may now be recovered for coke making, and, with the adoption of better combustion methods now available, the more inferior parts utilized for power purposes. The report rightly points out that figures regarding the potential reserves of metallurgical coking coals may probably be revised in an upward direction.

Dr. Forrester, in the summary of the work on page 1, may not be too optimistic in his conclusions, but the investigations at least show that the attitude of many persons, and particularly of the commercial interests, towards coal beneficiation during the past two decades has not been justifiable. If coal is to be sold on specification and utilized in a scientific manner to the common good, then the results recorded in this report show the way. We should like to pay tribute to those workers mentioned by Dr. Forrester in the report and we appreciate very much the help, support and guidance given consistently by Sir Shanti Swarup Bhatnagar. We wish to acknowledge also the assistance obtained from colliery owners and particularly the members of the Indian Mining Federation and the Indian Colliery Owners' Association, without whose co-operation many of the samples could not have been obtained. Credit is due to Mr. H. K. Sen, Chief Coal Inspector of the Tata Collieries, who was responsible for the collection of most of the samples — a matter requiring much care and experience — often under very difficult and trying conditions. The thanks of the Fuel Research Committee are also due to Dr. Forrester for the generous manner in which he has devoted a large measure of his time and knowledge to the supervision of these investigations which we trust will be a substantial contribution to the physical and chemical survey of Indian coals. We also have to acknowledge the helpful advice and assistance given in the later stages of the work by Dr. J. W. Whitaker, Director of the Fuel Research Institute, and by Dr. A. Lahiri, Secretary of the Fuel Research Committee. The washability investigations now form part of the work of the Fuel Research Institute, having been formally taken over by the Director from October 1, 1947. Washability curves of Indian coals often present unusual features, and in my opinion the results of these tests will, when submitted to careful scrutiny and analysis, yield a rich harvest, both technically and commercially.

A. FARQUHAR

Chairman

Fuel Research Committee

October 21, 1947